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6/1/99

**Record of Decision for Release Block H,  
Mound Plant, Miamisburg, Ohio**



**FINAL**

**June 1999**

OFFICE OF REGIONAL COUNSEL CONCURRENCE SHEET

SUBJECT: DOE MOUND - ROD FOR RELEASE CLOCK H

CONTROL NO. (if applicable): \_\_\_\_\_

Originator	( <u>Thur low</u> )	<u>TVI</u>	Date <u>7/9/99</u>
Section Chief	( <u>Nelson</u> )	<u>TLN</u>	Date <u>7/12/99</u>
Branch Chief	( <u>Smith/Gibbs</u> )	<u>MES</u>	Date <u>7/12/99</u>
Deputy RC	( <u>Frey</u> )		Date _____
Regional Counsel	( <u>Ginsberg</u> )		Date _____

(PLEASE INDICATE NAME OF APPROPRIATE DIVISION(S) WHERE CONCURRENT SIGNOFF IS NECESSARY)

NAME OF DIVISION SUPERFUND DIVISION

Assigned Staff Person	( _____ )	Date _____
Section Chief	( _____ )	Date _____
Branch Chief	( _____ )	Date _____
Division Director	( _____ )	Date _____
Other	( _____ )	Date _____

NAME OF DIVISION \_\_\_\_\_

Assigned Staff Person	( _____ )	Date _____
Section Chief	( _____ )	Date _____
Branch Chief	( _____ )	Date _____
Division Director	( _____ )	Date _____
Other	( _____ )	Date _____

OFFICE OF THE REGIONAL ADMINISTRATOR

Other	( _____ )	Date _____
Deputy Regional Administrator	( <u>Jordan</u> )	Date _____
Deputy Regional Administrator	( <u>Ulrich</u> )	Date _____
Regional Administrator	( <u>Adamkus</u> )	Date _____

RETURN TO ORC-Cheryl Klebenow (886-6771)(C-29A)

\* AFTER RC SIGNATURE SEND TO TIM FISCHER (SRF-ST)

OFFICE OF REGIONAL COUNSEL CONCURRENCE SHEET

SUBJECT: DOE MOUND - ROD FOR RELEASE BLOCK H

CONTROL NO. (if applicable): \_\_\_\_\_

Originator	(	)	_____	Date	_____
Section Chief	(	)	_____	Date	_____
Branch Chief	(	Smith/Cohen	)	Date	_____
Deputy RC	(	Frey	)	Date	_____
Regional Counsel	(	Ginsberg	)	Date	_____

(PLEASE INDICATE NAME OF APPROPRIATE DIVISION(S) WHERE CONCURRENT SIGNOFF IS NECESSARY)

NAME OF DIVISION ORC SUPERFUND

Assigned Staff Person	(	TIM FISCHER	)	<u>JF</u>	Date	<u>7/7/99</u>
Section Chief	(	KEN TINDALL	)	<u>K.T.</u>	Date	<u>7/8/99</u>
Branch Chief	(	BILL BOLEN	)	<u>BB</u>	Date	<u>7/9/99</u>
Division Director	(	WILLIAM MUND	)	<u>WEM</u>	Date	<u>7/14/99</u>
Other	(		)		Date	_____

NAME OF DIVISION \_\_\_\_\_

Assigned Staff Person	(	)	_____	Date	_____
Section Chief	(	)	_____	Date	_____
Branch Chief	(	)	_____	Date	_____
Division Director	(	)	_____	Date	_____
Other	(	)	_____	Date	_____

OFFICE OF THE REGIONAL ADMINISTRATOR

Other	(	)	_____	Date	_____
<del>Deputy Regional Administrator</del>	(	<del>Jordan</del>	)	Date	_____
<del>Deputy Regional Administrator</del>	(	<del>Ullrich</del>	)	Date	_____
<del>Regional Administrator</del>	(	<del>Adamkus</del>	)	Date	_____

RETURN TO ORC-Cheryl Klebenow (886-6771)(C-29A)

~~UNDERGOING CONCURRENT SIGN-OFF WITH ORC!~~  
signed name included

**YELLOW COPY**

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5**

**Date:**

**Subject:** Request for Concurrence on the Record of Decision for the U.S. DOE Mound Plant - Release Block H site in Miamisburg, Ohio

**From:** Bill Bolen, Acting Chief  
Remedial Response Branch #1

Michael G. Smith, Chief  
Multi-Media Branch #1

**To:** William E. Munro, Director  
Superfund Division

The purpose of this memorandum is to convey our recommendation that you sign the attached Record of Decision (ROD) for the U.S. DOE Mound Plant - Release Block H, located in Miamisburg, Ohio.

In accordance with the Federal Facilities Agreement signed by U.S. DOE, U.S. EPA, and the Ohio Environmental Protection Agency pursuant to Section 120 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9620, the U.S. DOE has prepared and signed the ROD and hereby submitted it for U.S. EPA's approval and subsequent signature. U.S. DOE drafted the ROD in accordance with CERCLA; to the extent practicable, the National Contingency Plan, 40 CFR Part 300; and Agency policy. We have reviewed the attached documents and have concluded that the ROD is both legally and technically sufficient. As such, we believe that concurrence on the implementation of this remedial measure is a proper exercise of your delegated authority.

Please feel free to contact either of us should you have any questions.

Attachment

SIGN-OFF FOR THE OFFICE OF SUPERFUND DIVISION									
	Project Manager	Section Secrtry	Section Chief	Branch Secrtry	Branch Chief	Division Secrtry	Director		Other
Initials	JJA		RT						
Date	7/7/99		7/8/99						

**YELLOW COPY**



**Department of Energy**

**Ohio Field Office  
Miamisburg Environmental Management Project  
P.O. Box 66  
Miamisburg, Ohio 45343-0066**

JUN 24 1999

MB-0564-99

**Mr. William Muno  
U. S. Environmental Protection Agency  
SRF-5J  
77 West Jackson Boulevard  
Chicago, Illinois 60604**

Dear Mr. Muno:

Pursuant to the Federal Facilities Agreement and Section 120 (h) (3) of CERCLA, which requires review and approval by the U. S. Environmental Protection Agency (USEPA) in consultation with the Ohio Environmental Protection Agency (OEPA), prior to the transfer of property on the National Priority List, the following document is enclosed for your signature:

Record of Decision for Release Block H, Mound Plant, Miamisburg, Ohio, Final, June, 1999.

Final copies will be provided to the parties and the Administrative Record upon execution. The Department of Energy wishes to thank both agencies for their support during this effort.

Should there be any questions, please contact me at (937) 865-3252.

Sincerely,

  
Richard B. Provencher  
Director

Enclosure  
cc w/o encl:  
T. Fischer, USEPA  
T. Thurlow, USEPA  
G. Mitchell, OEPA  
B. Nickel, OEPA  
J. Hurdley, OEPA Columbus  
R. Vandergrift, ODH  
A. Kleinrath, DOE

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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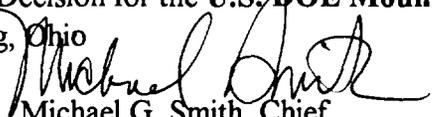
Attachment

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Attachment

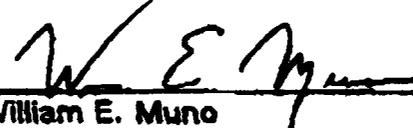
**1.7 Authorizing Signatures and Support Agency Acceptance**

This Record of Decision for Release Block H of the Mound Plant has been prepared by the DOE. Approval of the US EPA and OEPA is required and has been secured as documented below.

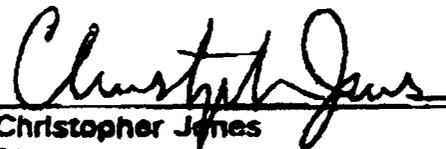
This ROD is authorized for implementation.

  
\_\_\_\_\_  
G. Leah Dever  
Ohio Field Office Manager,  
U. S. Department of Energy

6/18/99  
Date

  
\_\_\_\_\_  
William E. Muno  
Director, Superfund Division,  
U. S. Environmental Protection Agency, Region V

7/12/99  
Date

  
\_\_\_\_\_  
Christopher Jones  
Director,  
Ohio Environmental Protection Agency

7/22/99  
Date

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## ACRONYMS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
BDP	Building Data Package
BVA	Buried Valley Aquifer
CERCLA	Comprehensive Environmental Response Compensation & Liability Act
COC	Chemical of Concern
DOE	Department of Energy
FFA	Federal Facilities Agreement
FOD	Frequency of Detection
GV	Guideline Value
HEAST	Health Effects Assessment Summary Table
HI	Hazard Index
HQ	Hazard Quotient
IDM	Investigative Derived Material
IRIS	Integrated Risk Information System
MEMP	Miamisburg Environmental Management Project
MMCC	Miamisburg Mound Community Improvement Corporation
NCP	National Contingency Plan
NFA	No Further Assessment

NPL National Priority List

**ACRONYMS (continued)**

OAC Ohio Administrative Code

ODH Ohio Department of Health

OEPA Ohio Environmental Protection Agency

O & M Operations and Maintenance

ORC Ohio Revised Code

OSC On-Scene Coordinator

OU Operable Unit

pCi picocurie

PAH Polynuclear aromatic hydrocarbon

PETREX (trade name for a type of soil sampling)

PRS Potential Release Site

RB Release Block

RD/RA Remedial Design/Remedial Action

RI/FS Remedial Investigation/Feasibility Study

ROD Record of Decision

RRE Residual Risk Evaluation

RREM Residual Risk Evaluation Methodology

SARA Superfund Amendments and Reauthorization Act

SCM Site Conceptual Model

SM/PP Special Metallurgical/Plutonium Processing

US DOE United States Department of Energy

US EPA United States Environmental Protection Agency

UTL Upper Tolerance Limit

## **Record of Decision (ROD) for Release Block H, Mound Plant, Miamisburg, Ohio**

This Record of Decision (ROD) documents the remedy selected for Release Block H of the Mound Plant, Miamisburg, Ohio. The ROD is organized in three sections: a declaration, a decision summary, and a responsiveness summary.

### **1.0 DECLARATION**

This section summarizes the information presented in the ROD and includes the data certification sheet and authorizing signature page.

#### **1.1 Site Name and Location**

The U.S. Department of Energy (US DOE) Mound Plant (CERCLIS ID No. 04935) is located within the City of Miamisburg, in southern Montgomery County, Ohio. The Plant is approximately ten (10) miles southwest of Dayton and 45 miles north of Cincinnati. This ROD addresses Release Block (RB) H which is located in the northeast corner of the developed area of the plant.

#### **1.2 Basis and Purpose**

This decision document presents the selected remedy for Release Block H (RB H) of the Mound Plant. The remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable, the National Contingency Plan (NCP). Information used to select the remedy is contained in the Administrative Record file. The file is available for review at the Mound CERCLA Reading Room, Miamisburg Senior Adult Center, 305 Central Avenue, Miamisburg, Ohio.

The State of Ohio concurs with the selected remedy.

### **1.3 Site Assessment**

As documented in the Residual Risk Evaluation (RRE) for RB H and the Technical Position Report in Support of the RB H RRE, the risks from carcinogens and non-carcinogens to current and future occupants of RB H were evaluated. In those analyses, the type of occupant was limited to an industrial use scenario and was represented by a construction worker and a site employee (office employee). Based on the RRE, the risks for current industrial use are within the acceptable range. However, in order to ensure that future use of the site conforms to the RRE assumptions, it was necessary to consider a remedy that would prevent the site from being used for non-industrial purposes.

As described below, the remedy will protect future occupants of RB H from the threat of contaminants in the groundwater, and will ensure that RB H soils are appropriately evaluated prior to any removal of RB H soils from the Mound Plant National Priority List (NPL) facility boundary.

### **1.4 Description of Selected Remedy**

The selected remedy for RB H is institutional controls in the form of deed restrictions on future land use. DOE or its successors, as the lead agency for this ROD, has the responsibility to monitor, maintain and enforce these institutional controls. In order to maintain protection of human health and the environment at RB H in the future, the institutional controls to be adopted will:

- ▶ Ensure that industrial land use is maintained;
- ▶ Prohibit the use of bedrock ground water;
- ▶ Provide site access for federal and state agencies for the purpose of taking response actions, including sampling and monitoring; and
- ▶ Prohibit removal of RB H soils from the DOE Mound property (as owned in 1998) boundary without approval from the Ohio Department of Health (ODH) and the Ohio Environmental Protection Agency (OEPA), or their successor agencies.

A copy of the deed is attached in Appendix A.

### **1.5 Statutory Determinations**

The selected remedy for RB H is protective of human health and the environment,

complies with Federal and State requirements that are applicable or relevant and appropriate (ARAR), is cost-effective, and utilizes a permanent solution to the maximum extent practicable. Because this remedy will result in hazardous substances remaining in Release Block H above levels that allow for unlimited use and unrestricted exposure, DOE, in consultation with the U.S. Environmental Protection Agency (US EPA), OEPA and ODH, will review the remedial action each year to assure that human health and the environment are being protected by the remedial action being implemented. DOE reserves the right to petition the US EPA, OEPA, and ODH for a modification to the frequency established for conducting the effectiveness reviews.

## **1.6 ROD Data Certification Checklist**

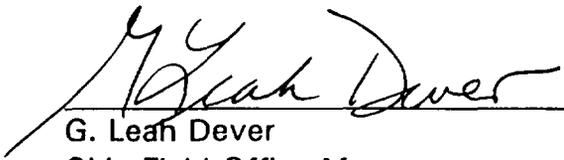
Based on a commitment made by the U.S. Environmental Protection Agency (US EPA) to the General Accounting Office, RODs must contain a checklist which certifies that key information regarding the selection of the remedy has been included in the ROD. Therefore, note that the following information is located in the Decision Summary (Section 2) of this ROD. Additional information on any of these topics can be found in the Administrative Record for Mound.

- chemicals of concern (COCs) and their respective concentrations,
- guideline levels for the COCs;
- risks represented by the COCs;
- current and future land and groundwater use assumptions used in the risk assessment and ROD;
- land and groundwater uses that will be available at the site as a result of the remedy;
- estimated cost of the remedy; and the
- decisive factor(s) that led to the selection of the remedy.

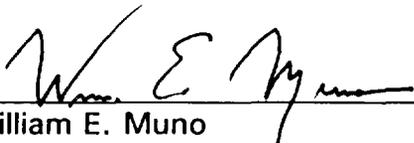
**1.7 Authorizing Signatures and Support Agency Acceptance**

This Record of Decision for Release Block H of the Mound Plant has been prepared by the DOE. Approval of the US EPA and OEPA is required and has been secured as documented below.

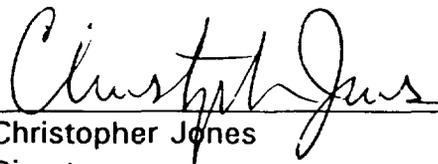
This ROD is authorized for implementation.

  
\_\_\_\_\_  
G. Leah Dever  
Ohio Field Office Manager,  
U. S. Department of Energy

6/18/99  
Date

  
\_\_\_\_\_  
William E. Muno  
Director, Superfund Division,  
U. S. Environmental Protection Agency, Region V

7/14/99  
Date

  
\_\_\_\_\_  
Christopher Jones  
Director,  
Ohio Environmental Protection Agency

7/22/99  
Date

## **2.0 DECISION SUMMARY**

This section provides an overview of the site and the alternatives evaluated. The selected remedy, and the basis for its selection, are also described.

### **2.1 Site Description**

The DOE Mound Plant (CERCLIS ID No. 04935) is located within the city limits of Miamisburg, in southern Montgomery County, Ohio (Figure 2-1). The Site is approximately ten (10) miles south-southwest of Dayton and 45 miles north of Cincinnati. Miamisburg is predominantly a residential community with supportive commercial facilities and industrial development. The adjacent upland areas are used primarily for residences and agriculture or are unused open spaces.

The Mound property is divided into nineteen "release blocks," which are contiguous tracts of property designated for transfer of ownership. These nineteen release blocks may be reconfigured to accommodate transfer of Mound property for economic development.

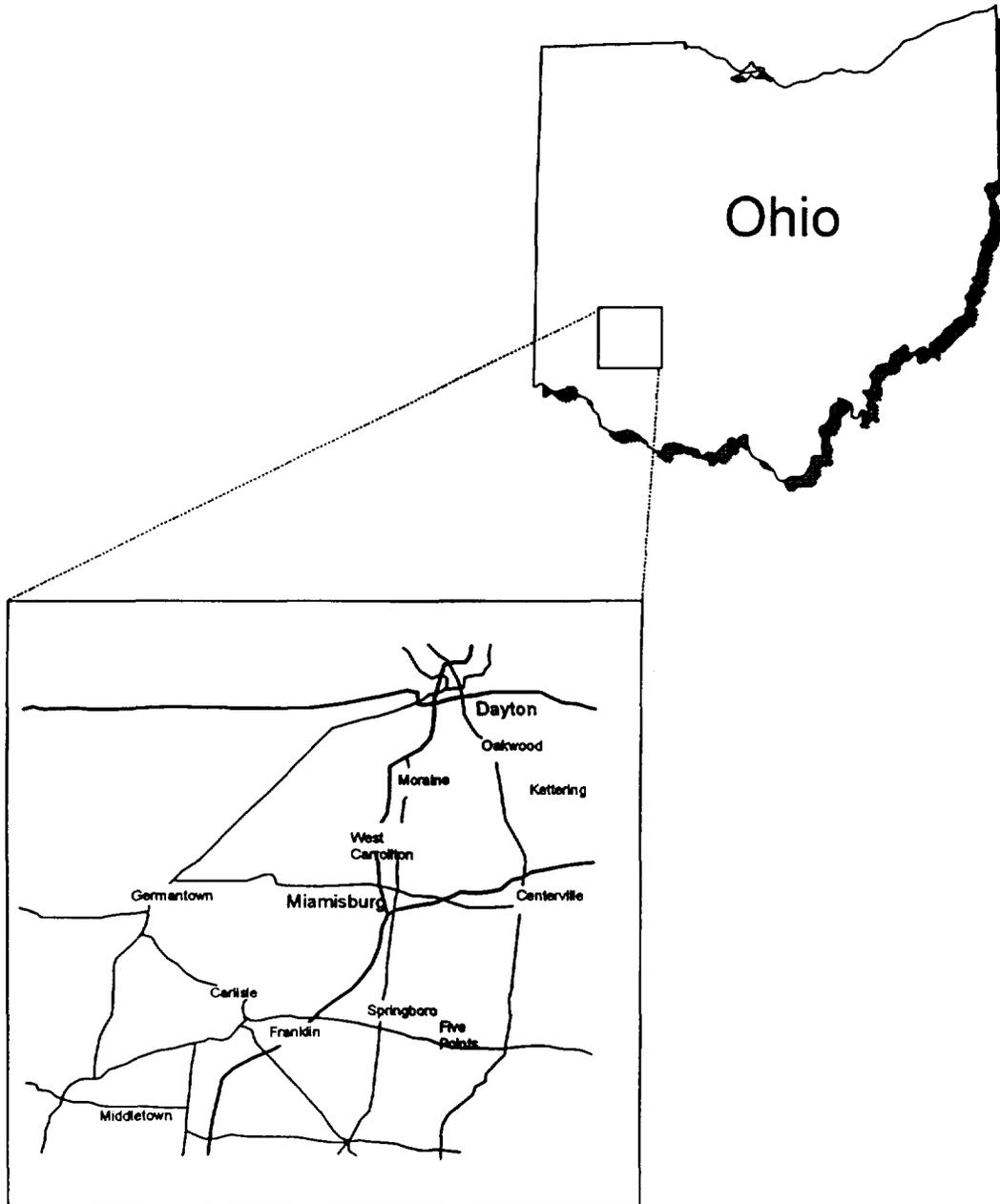
This ROD addresses Release Block (RB) H (Figure 2-2) which is located in the northeast corner of the developed area of the plant. The legal description of RB H is reproduced in Appendix B. RB H is generally bound to the south by the main plant entrance, to the east by an offsite community golf course, to the north by off-site residents, and to the west by a fenced parking lot.

There are no structures in RB H.

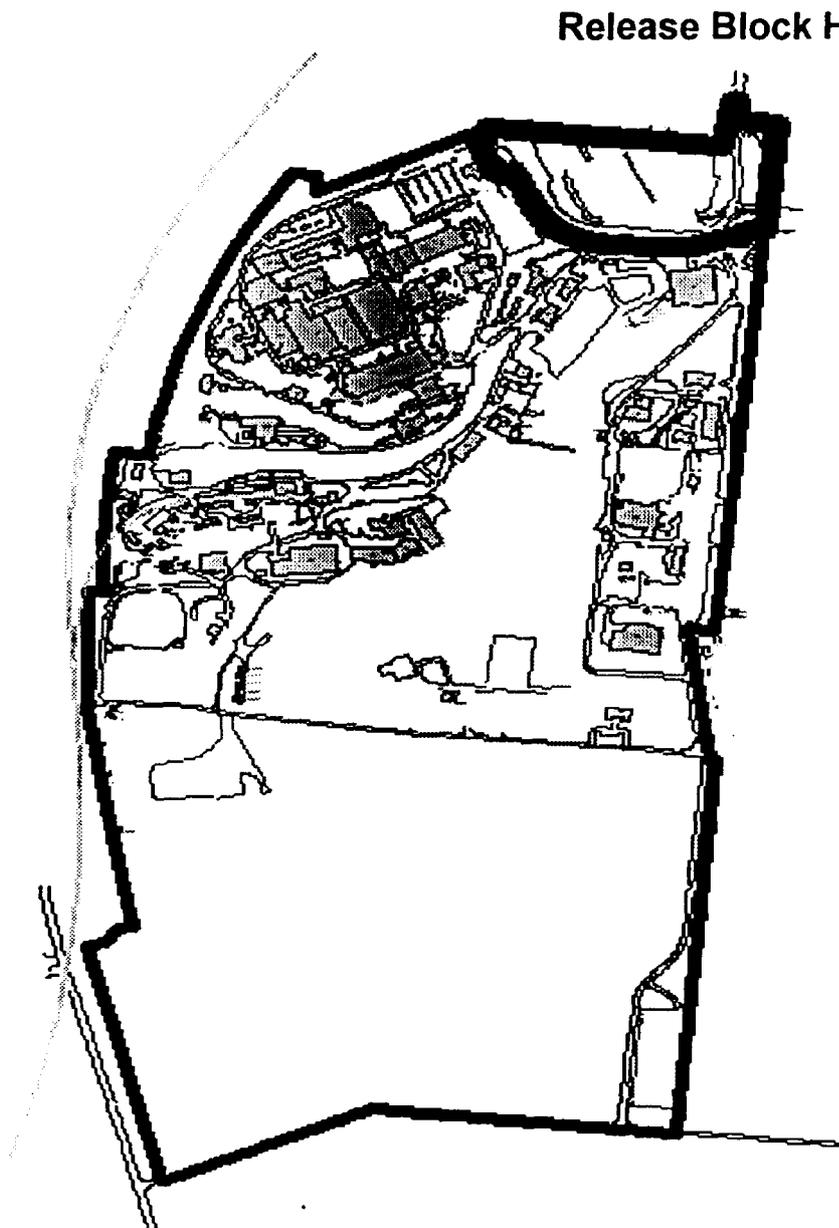
### **2.2 Site History and Enforcement Activities**

As a result of historic disposal practices and contaminant releases to the environment, the Mound Plant was placed on the National Priorities List (NPL) on November 21, 1989. DOE signed a Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Section 120 Federal Facility Agreement (FFA) with US EPA, effective October 1990. In 1993, this agreement was modified and expanded to include OEPA. DOE serves as the lead agency for CERCLA-related activities at Mound.

**Figure 2-1. Regional Context of the Mound Plant**



**Figure 2-2. Location of Release Block H**



DOE, US EPA, and OEPA had originally planned to address the Plant's environmental restoration issues under a set of Operable Units (OUs), each of which would include a number of Potential Release Sites (PRSs). For each OU, the site would follow the traditional CERCLA process: a Remedial Investigation/Feasibility Study (RI/FS), followed by a Record of Decision (ROD), followed by Remedial Design/Remedial Action (RD/RA). After initiating remedial investigations for several OUs, DOE and its regulators realized during a strategic review in 1995 that, for Mound, the OU approach was inefficient. DOE and its regulators agreed that it would be more appropriate to evaluate each PRS or building separately, use removal action authority to remediate them as needed, and establish a goal for no additional remediation other than institutional controls for the final remedy. To evaluate any residual risk after all removals have been completed, a residual risk evaluation is conducted to ensure the block or parcel is protective of human health for industrial reuse. This process was named the Mound 2000 process. DOE and its regulators pursued this approach with the understanding that US EPA and OEPA reserve all rights to enforce all provisions of the FFA and participation in the Mound 2000 process does not constitute a waiver of US EPA and OEPA rights to enforce the FFA.

The Mound 2000 process established a "core team" consisting of representatives of the Miamisburg Environmental Management Project (MEMP) of DOE, US EPA, and OEPA. The Core Team evaluates each of the potential contamination problems and recommends the appropriate response. The Core Team uses process knowledge, site visits, and existing data to determine whether or not any action is warranted concerning the possible problem area. If a decision cannot be made, the Core Team identifies specific information needed to make a decision (e.g., data collection, investigations). The Core Team also receives input from technical experts as well as the general public and/or public interest groups. Thus, all stakeholders have the opportunity to express their opinions or suggestions involving each potential problem area. The details of this process are explained in the "Workplan for Environmental Restoration at the Mound Plant, The Mound 2000 Approach," December 1998.

"The Mound 2000 Residual Risk Evaluation Methodology (RREM), Mound Plant, Final, Revision 0, January 6, 1997" was developed as a framework for evaluating human health risks associated with residual levels of contamination. The RREM is applied to a release block once necessary remediation has been completed, and the remaining PRSs or buildings in the release block have been designated as No Further Assessment (NFA). Once these environmental concerns have been adequately addressed by the Core Team, a residual risk evaluation (RRE) is performed. The RRE forms part of the basis for determining what restrictions should be placed on the site.

### 2.3 Community Participation

Opportunities to comment on the No Further Assessment (NFA) decision for PRS 93 and the residual risk documents for RB H were provided. A listing of those opportunities is shown in Table 2-1.

**Table 2-1. Public Comment Periods for Release Block H Documents**

<b>DOCUMENT (PRS/BUILDING)</b>	<b>COMMENT PERIOD (BEGIN)</b>	<b>COMMENT PERIOD (END)</b>
<b>93</b>	3/18/96	4/1/96
<b>RB H Residual Risk Evaluation</b>	4/30/97	6/16/97
<b>Technical Position Report in Support of the Release Block H Residual Risk Evaluation</b>	5/5/99	6/5/99

The Proposed Plan for RB H was made available to the public on May 5, 1999. Copies were distributed to stakeholders and were placed in the Administrative Record file in the CERCLA Public Reading Room, Miamisburg Senior Adult Center, 305 Central Avenue, Miamisburg, Ohio. The notice of the availability of the Plan was published in the *Miamisburg News* on May 5, 1999. A public comment period was held from May 5, 1999 through June 5, 1999. In addition, a public meeting was held on May 18, 1999 to present the Proposed Plan. Representatives of DOE, US EPA, and the OEPA were present at the public meeting to answer questions regarding the proposed remedy. Responses to comments received during the comment period and public meeting are included in the Responsiveness Summary, which is Section 3 of this ROD.

### 2.4 Scope and Role of RB H

RB H lies within what was once called Operable Unit 2 (OU2). RB H includes one Potential Release Site (PRS) that has undergone previous investigation. Before transfer of a release block can be completed, all buildings and PRSs must be evaluated for protectiveness to human health and the environment for industrial reuse or remediated to be protective. Any residual risks associated with remaining

contamination in RB H have been evaluated and presented in the RB H Residual Risk Evaluation (RRE) (August, 1997) and its supplement "Technical Position Report in Support of the Release Block H Residual Risk Evaluation, April, 1999."

The PRS in RB H was identified on the basis of actual measurements of contaminants. The location of the PRS within RB H is shown in Figure 2-3; its description appears in Table 2-2. As shown in Table 2-2, the PRS was determined by the Core Team to require no further assessment, although sampling and monitoring of the seep at PRS 93 will continue.

## **2.5 Site Characteristics**

### **2.5.1 Geologic Setting**

The bedrock section beneath Mound Plant consists of thin, nearly flat-lying beds of alternating shale and limestone of the Richmond Stage of the Cincinnati Group (Upper Ordovician -- about 450 million years ago). The Cincinnati Group is present at the surface at Mound Plant and underlies RB H. The limestone beds range from 2 to 6 inches in thickness and the shale layers are commonly 5 to 8 feet thick.

Pleistocene age (less than about 2 million years old) glacial deposits at Mound Plant include both till and outwash deposits. The till in the area of Mound Plant is composed of an unsorted, unstratified mixture of clay, silt, sand, and coarser material. Water-lain deposits consist of outwash composed of well-sorted sand and gravel. The sand and gravel is horizontally layered, and commonly cross-bedded. The outwash in the vicinity of Mound Plant occurs as restricted valley-train deposits that were formed by the aggregation of glacial meltwater streams. The outwash deposited in the Miami River Valley and the associated tributary valley forms the Buried Valley Aquifer (BVA) and contiguous deposits. A general discussion of the geology is presented in the "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan, Final, May 1992."

### **2.5.2 Hydrogeologic Setting**

There are two hydrogeologic regimes at Mound Plant: flow through the bedrock beneath the Main Hill and the Special Metallurgical/Plutonium Processing (SM/PP) Hill, and flow within the unconsolidated glacial deposits and alluvium associated with the BVA in the Great Miami River Valley and the tributary valley between the Main Hill

and SM/PP Hill. The BVA is a US EPA-designated sole source aquifer. The bedrock system, an interbedded sequence of shale and limestone, is dominated by fracture flow especially in the upper portions of the bedrock. Groundwater movement within the till and sand and gravel, within the buried valley, is through porous media. Groundwater flow from Mound Plant is generally to the west and southwest toward the BVA of the Great Miami River Valley. A discussion of the hydrogeology of Mound is presented in the OU9 Work Plan and the "Operable Unit 9; Hydrogeologic Investigation: Buried Valley Aquifer Report, Technical Memorandum, Revision 1 (September 1994)" and "Operable Unit 9 Hydrogeologic Investigation: Bedrock Report, Technical Memorandum, Revision 0 (January 1994)."

### **2.5.3 Available Data for Release Block H**

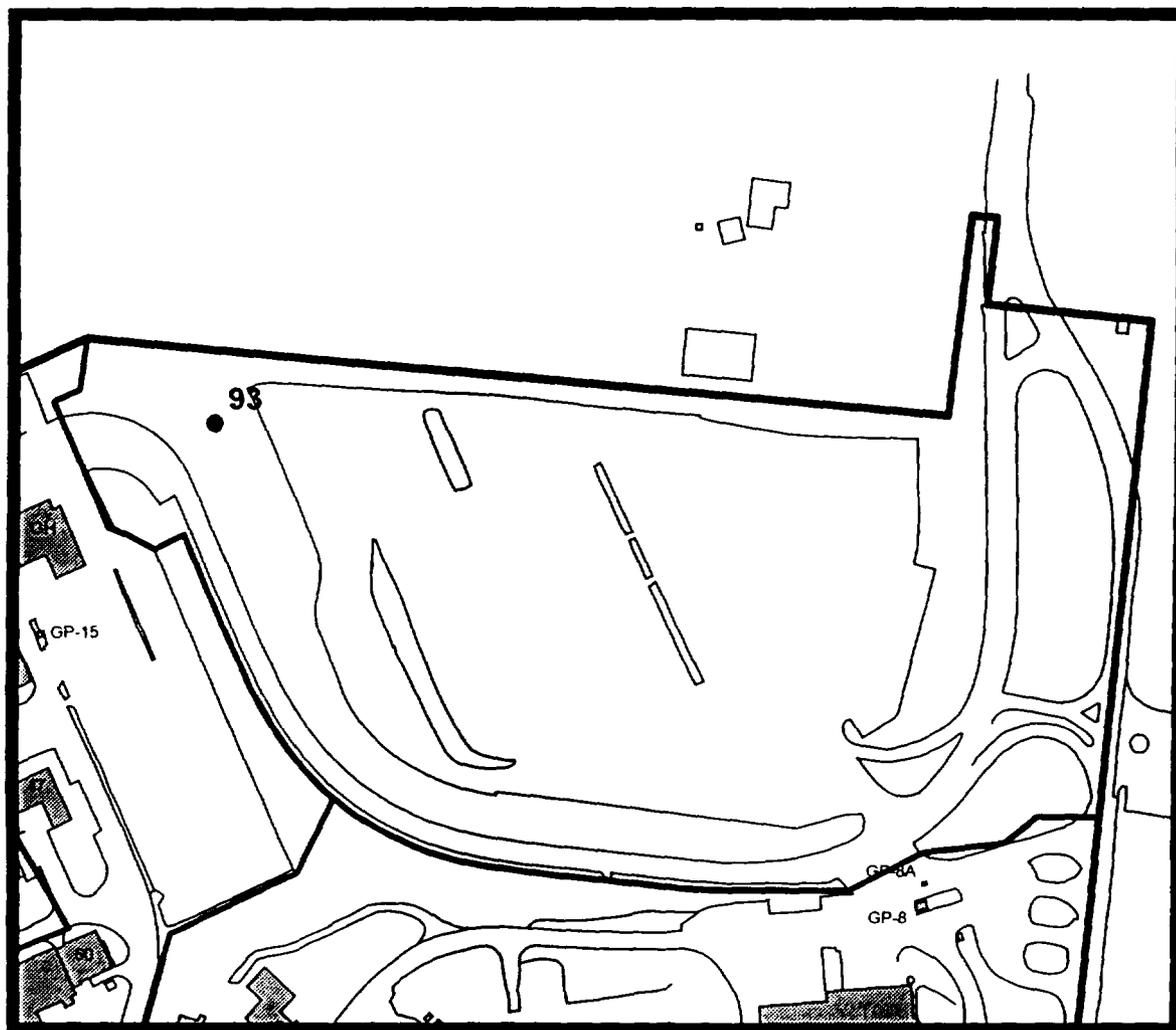
The PRS within RB H has been evaluated by the Core Team. The following sections discuss the data relevant to RB H that are available from the general source documents and the Potential Release Site package.

#### **2.5.3.1 Background Data**

**Soils.** Background concentrations measure the amount of a chemical that is naturally occurring (like metals) or anthropogenic (man-made but, for purposes of evaluating background, originating from sources other than the Mound Plant). Background concentrations are used as a screening tool to determine which contaminants should be carried through a risk evaluation as described in Section 2.7 of the ROD. Regional background concentrations in soil were determined during investigations conducted in September 1994 and August 1995 and are documented in reports titled "Operable Unit 9 Background Soils Investigation Soil Chemistry Report" and "Operable Unit 9, Regional Soils Investigation Report."

**Groundwater.** Background concentrations for groundwater were developed from two sources of data. For the Buried Valley Aquifer, background values were reported in the April 1995 "OU9 Hydrologic Investigation: Groundwater Sweeps Report." Background concentrations for bedrock groundwater were reported in the April 1995 "OU5 New Property Remedial Investigation Report."

**Figure 2-3. Location of PRS within RB H**



**Table 2-2. Release Block H PRS and Core Team Conclusions**

PRS/ BLDG	Reason for Identification	Core Team Decision	Close Out of PRS/BDP
93	Main Hill Seep #0603	Binned for No Further Assessment	Recommendation for NFA with continued monitoring signed by Core Team on 3/4/96.

### 2.5.3.2 Groundwater Contaminant Data

Groundwater data consist of water analyses of the Mound production wells screened within the Buried Valley Aquifer, and analyses of groundwater from monitoring wells screened in the bedrock aquifer on the Mound property. These wells are sampled as part of the site-wide groundwater monitoring network. Section 2.2.2 of the RRE for RB H documents the specific groundwater data used to evaluate the current and future groundwater profile for RB H. Summaries of the contaminants detected in Mound Plant groundwater, and those projected to be present in Mound Plant groundwater in the future, are shown in Tables 2-3 and 2-4, respectively.

### 2.5.3.3 Soil Contaminant Data

Soil data can be divided into three types: (1) data obtained through commercial analytical laboratory analysis; (2) data obtained through "screening" techniques conducted in a DOE laboratory; and, (3) data obtained through screening techniques conducted in the field. Analytical laboratory data are obtained using strict methods and are subjected to exacting quality control procedures. These data are of the highest quality, and are quantitative. The laboratory screening data are considered to be of lower quality because sample preparation does not occur, and the measuring instruments are less precise. The field screening techniques are the least accurate due to instrument limitations and the effects of ambient conditions on field measurements. Due to these limitations, field screening data were not used for any calculations in the RRE for RB H.

**Table 2-3. Current Mound Plant Groundwater Contaminants of Concern Based on the Plant Water Supply**

Groundwater Constituent	Maximum concentration	Screening Concentration (either background or G.V.)
<b>ORGANICS (mg/L)</b>		
1,1-Dichloroethene	0.0017	---
1,1,1-Trichloroethane	0.0018	0.0007 <sup>4</sup>
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0087	---
<b>INORGANICS (mg/L)</b>		
Cadmium	0.0077	0.051 <sup>2</sup>
Copper	0.593	0.0012 <sup>4</sup>
Lead	0.040	0.0101 <sup>4</sup>
<b>RADIONUCLIDES (pCi/L)</b>		
Actinium-227	0.335	0.26 <sup>3</sup>
Bismuth-210	0.39	---
Plutonium-239/240	2.0	0.125 <sup>4</sup>
Thorium-228	2.17	0.69 <sup>3</sup>
Tritium	7200	1485 <sup>4</sup>
Uranium-234	8.14	0.792 <sup>4</sup>
Uranium-238	8.25	0.688 <sup>4</sup>

- <sup>1</sup> - Guideline values (GVs) are decision-making tools for the Core Team. GV's help the Core Team determine if contaminants are present at levels that warrant evaluation.
- <sup>2</sup> - Hazard Quotient for ingestion, dermal and inhalation. Decision made on 0.1xGV.
- <sup>3</sup> - GV corresponds to a total risk of 10<sup>-6</sup> for ingestion only.
- <sup>4</sup> - Background value. When adequate numbers of measurements are available, background values are based on the 95th% upper tolerance limit.

Reference: "Technical Position Report in Support of the Release Block H Residual Risk Evaluation", Public Review Draft Rev 2, April, 1999.

**Table 2-3. Current Mound Plant Groundwater Contaminants of Concern Based on the Plant Water Supply**

Groundwater Constituent	Maximum concentration	Screening Concentration (either background or G.V.) <sup>1</sup>
<b>ORGANICS (mg/L)</b>		
1,1-Dichloroethene	0.0017	---
1,1,1-Trichloroethane	0.0018	0.0007 <sup>4</sup>
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0087	---
<b>INORGANICS (mg/L)</b>		
Cadmium	0.0077	0.051 <sup>2</sup>
Copper	0.593	0.0012 <sup>4</sup>
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Actinium-227	0.335	0.26 <sup>3</sup>
Bismuth-210	0.39	---
Plutonium-239/240	2.0	0.125 <sup>4</sup>
Thorium-228	2.17	0.69 <sup>3</sup>
Tritium	7200	1485 <sup>4</sup>
Uranium-234	8.14	0.792 <sup>4</sup>
Uranium-238	8.25	0.688 <sup>4</sup>

<sup>1</sup> - Guideline values (GVs) are decision-making tools for the Core Team. GV's help the Core Team determine if contaminants are present at levels that warrant evaluation.

<sup>2</sup> - Hazard Quotient for ingestion, dermal and inhalation. Decision made on 0.1xGV.

<sup>3</sup> - GV corresponds to a total risk of 10<sup>-6</sup> for ingestion only.

<sup>4</sup> - Background value. When adequate numbers of measurements are available, background values are based on the 95th% upper tolerance limit.

Reference: "Technical Position Report in Support of the Release Block H Residual Risk Evaluation", Public Review Draft Rev 2, April, 1999.

**Table 2-4. Future Mound Plant Groundwater Contaminants of Concern**

Groundwater Constituent	Estimated Maximum Concentration	Screening Concentration (either background or G.V.) <sup>1</sup>
<b>ORGANICS (mg/L)</b>		
1,1-Dichloroethane	0.0017	---
1,1,1-Trichloroethane	0.0065	0.0007 <sup>4</sup>
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0087	---
<b>INORGANICS (mg/L)</b>		
Beryllium	0.0001	0.000066 <sup>6</sup>
Bismuth	0.0016	---
Cadmium	0.0077	0.051 <sup>2</sup>
Chromium	0.4961	0.0061 <sup>4</sup>
Cobalt	0.0039	---
Copper	0.5964	0.0012 <sup>4</sup>
Lead	0.040	0.010 <sup>4</sup>
Molybdenum	0.0098	0.0056 <sup>4</sup>
<b>RADIONUCLIDES (pCi/L)</b>		
Actinium-227	0.355	0.26 <sup>3</sup>
Bismuth-210	0.39	---
Plutonium-239/240	2.02	0.125 <sup>4</sup>
Thorium-228	2.17	0.69 <sup>3</sup>
Tritium	10427	1485 <sup>4</sup>
Uranium-234	8.14	0.792 <sup>4</sup>
Uranium-238	8.25	0.688 <sup>4</sup>

- <sup>1</sup> - Guideline values (GVs) are decision-making tools for the Core Team. GV's help the Core Team determine if contaminants are present at levels that warrant evaluation.
- <sup>2</sup> - Hazard Quotient for ingestion, dermal and inhalation. Decision made on 0.1xGV.
- <sup>3</sup> - GV corresponds to a total risk of 10<sup>-6</sup> for ingestion only.
- <sup>4</sup> - Background value. When adequate numbers of measurements are available, background values are based on the 95th% upper tolerance limit.
- <sup>6</sup> - Total Risk 10<sup>-6</sup> for ingestion, dermal and inhalation

Reference: "Technical Position Report in Support of the Release Block H Residual Risk Evaluation", Public Review Draft Rev 2, April, 1999.

Soil contaminant data for RB H collected prior to the Mound 2000 process are documented in a number of DOE reports. These references include:

- Other Soils Characterization Report, Volume I - Text. Final, Revision 0. May 1, 1995 *(results of systematic sampling)*,
- OU-5 Operational Area Phase I Investigation Non-AOC Field Reports, Volume I - Text. Final, Revision 0. June 1, 1995 *(results of systematic sampling in southern area of site, gives general overview of soils not thought to be contaminated)*,
- OU-9 Regional Soils Investigation Report, Revision 2. August 1, 1995 *(purpose was to give a regional soil description away from impacts of Mound operations)*,
- OU-3 Miscellaneous Sites Limited Field Investigation Report, Volumes 1, 2, and 3. Final, Revision 0. July 1, 1993 *(purpose was to address areas noted in previous surveys; but, not thought to endanger human health or environment)*,
- OU-9 Site Scoping Report, Volume 3 - Radiological Site Survey, Final, June 1, 1993 *(a compendium of existing data)*, and
- Soil Gas Confirmation Sampling. Revision 0. April 1, 1996 *(results of a study following up on a prior qualitative study)*.

In the Mound 2000 process, radionuclide and chemical contaminants were studied on a PRS basis. There is one PRS within RB H, PRS 93. PRS 93 was identified as a PRS because it is the site of Seep O603 and other seeps showed elevated concentrations of tritium. Tritium was detected at PRS 93 at low concentrations, i.e., in the range of 1000-3000 pCi/L.

Soil was sampled at PRS 93. All radionuclide and other contaminant concentrations were in the range of background.

A summary of the contaminants detected in RB H soils is shown in Table 2-5.

## **2.6 Potential Future Uses for Mound**

The Mound Plant will remain in industrial use into the future. This future use has been determined based upon agreement among DOE, US EPA, OEPA, and interested stakeholders. This land use is reflected in the Mound Comprehensive Reuse Plan of the Miamisburg Mound Community Improvement Corporation (MMCIC) and is currently codified in the City of Miamisburg Zoning Ordinance for industrial use.

## **2.7 Summary of Site Risks**

The human health risks for RB H were evaluated using the Residual Risk Evaluation Methodology (RREM) document developed for Mound. A residual risk evaluation (RRE) is a five-step process:

- (1) identification of contaminants,
- (2) exposure assessment,
- (3) toxicity assessment,
- (4) risk characterization, and
- (5) evaluation of potential cumulative risks.

**Table 2-5. Soil Contaminants of Concern for RB H**

Soil Constituent	Maximum concentration Any Depth	Maximum concentration Shallow (<2' deep)	Screening Concentration (either Skpt or GV)
<b>ORGANICS (mg/kg)</b>			
Acenaphthene	0.18	0.18	
Acenaphthylene	0.7	0.7	
Aldrin	0.0031	0.0031	
Benzo(a)pyrene	1.115	1.115	0.41 <sup>2</sup>
Benzo(g,h,i) perylene	1.0625	1.0625	
delta-BHC	0.00025	0.00025	
Carbazole	0.5875	0.5875	
alpha Chlordane	0.01	0.01	
gamma Chlordane	0.0074	0.0074	
4-chloro-3-methyl phenol	0.047	0.047	
Dibenzo(a,h)anthracene	0.78	0.78	0.41 <sup>2</sup>
Dibenzofuran	1.035	1.035	
Fluorene	1.45	1.45	
Heptachlor epoxide	0.0022	0.0022	
2-Methylnaphthalene	0.92	0.92	
Naphthalene	2.625	2.625	
Phenanthrene	3.75	3.75	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.002	0.002	
<b>INORGANICS (mg/kg)</b>			
Arsenic (total)	10.9	10.9	8.6 <sup>3</sup>
Bismuth	58.6	58.6	
Copper (total)	26.4	22.1	26 <sup>3</sup>
Lead (total)	163	163	48 <sup>3</sup>
Lithium	40.2	19	26 <sup>3</sup>
<b>RADIONUCLIDES (pCi/g)</b>			
Cesium-137	1.9	1.9	0.42 <sup>4</sup>
Plutonium-238	56	56	0.13 <sup>3</sup>
Plutonium-242	0.0143	0.0143	
Potassium-40	45.4	21	37 <sup>3</sup>
Radium-226	3.15	3.15	0.13 <sup>4</sup>

Note: Blanks indicate background or Guideline Value not available. The more restrictive GV was used to determine which contaminants were carried through the RRE.

- <sup>1</sup> - Guideline values (GVs) are decision-making tools for the Core Team. GV's help the Core Team determine if contaminants are present at levels that warrant evaluation.
- <sup>2</sup> - GV corresponds to a total risk of 10<sup>-6</sup> for the ingestion pathway.
- <sup>3</sup> - Background Value. When adequate numbers of measurements are available, background values are based on the 95% upper tolerance limit.
- <sup>4</sup> - GV corresponds to a total risk 10<sup>-6</sup> for the ingestion, inhalation and external pathways.

Reference: "Technical Position Report in Support of the Release Block H Residual Risk Evaluation", Public Review Draft Rev 2, April, 1999.

### **2.7.1 Identification of Contaminants**

The contaminants of concern (COCs) for RB H were identified by reviewing all of the sampling data for the release block. Based on that review, contaminants were eliminated for further evaluation based on criteria established in the RREM. Specifically, only contaminants exceeding (1) background, (2) a base level of potential health concern, and (3) certain frequency of detection (FOD) criteria were carried through the RRE. The COCs established for RB H are listed in Tables 2-3, 2-4, and 2-5.

### **2.7.2 Exposure Assessment**

The Site Conceptual Model (SCM) for Mound provides the basis for evaluating human exposure scenarios. Because DOE and its regulators and stakeholders agree that the future use of Release Block H will be industrial in nature, two receptor scenarios from the Mound SCM apply: a construction worker and a site employee. The routes of exposure applicable to these two receptors are shown in Figure 2-4. The significant pathways for RB H include ingestion of soil and groundwater.

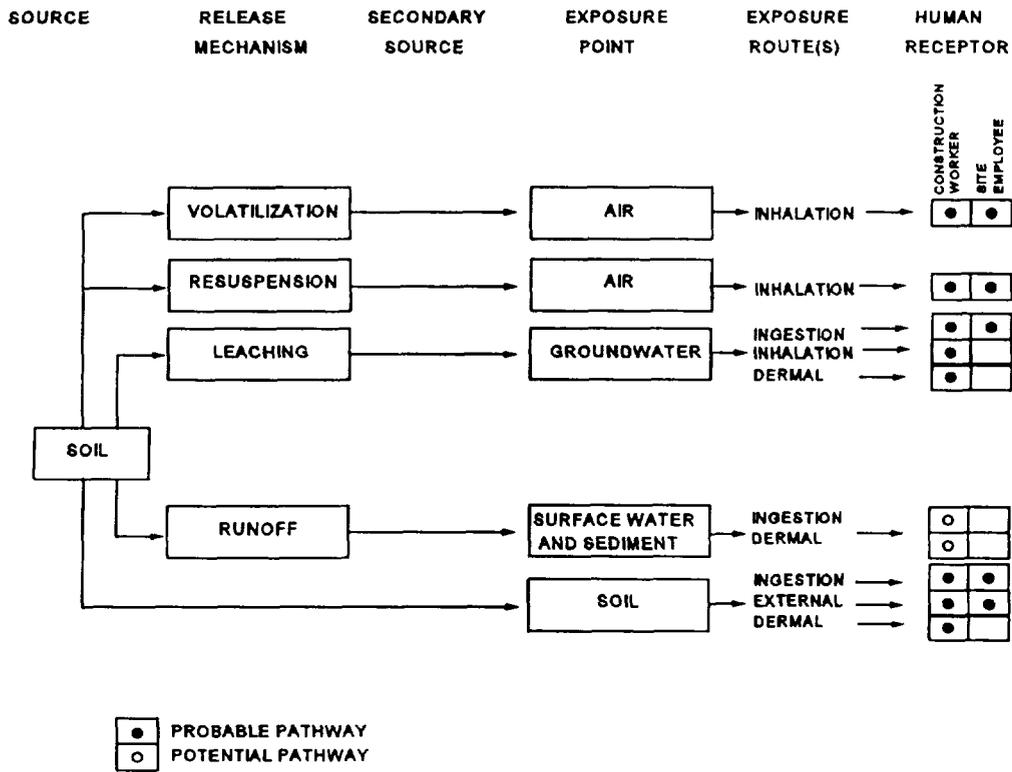
Using equations developed to support the SCM, exposures to specific concentrations of COCs are evaluated based on assuming intake rates for soil and groundwater. Once the intakes are estimated, the human health implications of those intakes are evaluated by reviewing toxicological data for the COCs.

For the special case of groundwater, the possible exposures to current and future COCs are evaluated. This approach ensures that the cumulative and long-term impacts of the COCs are adequately characterized.

### **2.7.3 Toxicity Assessment**

The toxicological properties of each COC for RB H were evaluated by reviewing the Integrated Risk Information System (IRIS) and/or Health Effects Assessment Summary Table (HEAST) data for the COC. IRIS files provide no-observable effect levels and slope factors (for translating intake into cancer risk) for many of the chemicals encountered at Mound. HEAST provides slope factors for many of the radionuclides encountered at Mound. Based on the information collected from IRIS and HEAST, an adequate understanding of the toxicology of the RB H COCs has been developed.

**Figure 2-4. Exposure Pathways for the Mound Site Conceptual Model**



## 2.7.4 Risk Characterization

Pursuant to the RREM, risks are quantified for both carcinogenic and non-carcinogenic contaminants. The risk associated with the intake of a known or suspected carcinogen is reported in terms of the incremental lifetime cancer risk presented by that COC, as estimated using the appropriate slope factor and the amount of material ingested. Potential human health hazards from exposure to non-carcinogenic contaminants are evaluated by using a Hazard Quotient (HQ). The HQ is determined by the ratio of the intake of a COC to a reference dose or concentration for the COC that is believed to represent a no-observable effect level. The COC-specific HQs are then summed to provide an overall Hazard Index (HI). US EPA guidance sets a limit of 1.0 for the Comprehensive HI.

The risks and hazards associated with residual concentrations of COCs in RB H are shown in Table 2-6. As shown in the table, the overall risk values are in the acceptable range of  $10^{-4}$  to  $10^{-6}$ . The HIs for the future groundwater scenarios, however, are near or above the 1.0-limit. This is based on the bedrock groundwater contaminants flowing directly to the BVA that supplies drinking water for the plant. As a result, the selected remedy prohibits the use of bedrock groundwater. This institutional control, in the form of a deed restriction, will ensure that the residual risks associated with RB H remain acceptable.

Because the scope of the RRE was limited to industrial use, the soils within RB H have not been evaluated for unrestricted release (e.g., residential use). Disposition of RB H soils without proper handling, sampling and management could create an unacceptable risk to human health and the environment.

## 2.7.5 Evaluation of Potential Cumulative Risks

For purposes of the RREM, risks resulting from contaminants that originate outside the release block under consideration are called cumulative risks. In general, cumulative risks are possible via air, surface water, and ground water. For Mound, cumulative risks from surface waters are not expected because, other than storm water drainage, there are no surface water bodies flowing through RB H from other release blocks. Groundwater and air are therefore the media of concern for cumulative risks.

**Current groundwater.** The Mound RREM accounts for cumulative groundwater risks by evaluating current and future groundwater contamination. Since all groundwater currently used at Mound is drawn from the production wells located onsite, the risk

posed by current groundwater contamination is equal to the risk resulting from exposure to contaminants found in the production wells. This risk is identical for all release blocks and represents the cumulative risk from contaminants that migrate to the production wells from all release blocks.

**Future groundwater.** The future risk from groundwater was estimated for RB H based on the assumption that contaminants found in bedrock will eventually migrate to the Mound Plant production well located in the BVA. A simple and extremely conservative flow model was used to estimate the concentrations as a function of time. These concentration estimates were reported in Table 2-4.

**Air.** The Mound RREM accounts for cumulative residual risk via the air pathway by using data collected in 1994 from the Mound Plant perimeter air sampling stations to bound the concentrations and therefore the risks from inhalation of radionuclides present in ambient air. These values are reported in the "Technical Position Report in Support of the Release Block H Residual Risk Evaluation" and are included in Table 2-6.

The HI and risk values presented in Table 2-6 for the current groundwater, future groundwater, and air scenarios are therefore believed to adequately bound the potential cumulative risk for RB H. The potential cumulative risk can be added to the risks from exposures to contaminants within the release block to provide a measure of overall risk. The risk values presented in Table 2-6 labeled "Sum of Soil, Air and Groundwater" are therefore believed to adequately bound the potential overall risk.

### **2.7.6 Ecological Risk Assessment**

Based on the results of an ecological characterization of the Mound Plant (OU-9 Ecological Characterization, March, 1994) there are no endangered species or critical habitats of endangered species on RB H. In addition, RB H is composed entirely of a parking lot, roads, and mowed lawns. There are no wetlands or surface waters located in RB H and no sensitive habitats. Therefore, DOE has determined, with concurrence from US EPA and OEPA, that an ecological assessment for RB H is not necessary.

## **2.8 Remediation Objectives**

The primary remediation objective for RB H is to ensure the residual risk associated with the release block is acceptable for the defined use scenario of industrial occupants.

**Table 2-6. Current and Future Residual Risks for Release Block H**

Construction Worker						
	Soil	Air	Groundwater Current	Groundwater Future	Sum of Soil, Air and Groundwater Current	Sum of Soil, Air and Groundwater Future
Non-carcinogenic Hazard Index for Organics & Inorganics	4.0E-02	N/A	3.7E-02	1.6E+00	HI = 7.7E-02	HI = 1.7E+00
Carcinogenic Risks for Organics & Inorganics	4.7E-06	N/A	N/A	N/A	Risk = 4.7E-06	Risk = 4.7E-06
Carcinogenic Risks for Radionuclides	1.7E-05	2.0E-07	2.5E-06	2.9E-06	Risk = 2.0E-05	Risk = 2.3E-05
Construction Worker						
Overall HI =					7.7E-02	1.7E+00
Overall Risk =					2.5E-05	2.8E-05

Site Employee						
	Soil	Air	Groundwater Current	Groundwater Future	Sum of Soil, Air and Groundwater Current	Sum of Soil, Air and Groundwater Future
Non-carcinogenic Hazard Index for Organics & Inorganics	4.0E-03	N/A	3.7E-02	1.6E+00	HI = 4.1E-02	HI = 1.6E+00
Carcinogenic Risks for Organics & Inorganics	2.0E-06	N/A	N/A	N/A	Risk = 2.0E-06	Risk = 2.0E-06
Carcinogenic Risks for Radionuclides	1.8E-05	9.9E-07	1.3E-05	1.4E-05	Risk = 3.2E-05	Risk = 4.6E-05
Site Employee						
Overall HI =					4.1E-02	1.6E+00
Overall Risk =					3.4E-05	4.8E-05

## **2.9 Description of Alternatives**

As documented in Section 2.7, the risk from both carcinogens and non-carcinogens from RB H is within the acceptable range for the current industrial use. In light of the planned exit of DOE from the site, and the residual levels of contaminants in the soil and groundwater in RB H, a remedy must be implemented to protect human health and the environment into the future. Two alternatives were considered for RB H; they are described below.

### **2.9.1 No Action**

Regulations governing the Superfund program require that the "no action" alternative be evaluated at each site to establish a baseline for comparison. Under this alternative, DOE would take no action to prevent exposure to soil and groundwater contamination associated with RB H.

### **2.9.2 Institutional Controls**

In this alternative, institutional controls in the form of deed restrictions on future land use would be placed on RB H. The objective of these institutional controls would be to prevent an unacceptable risk to human health and the environment by restricting the use of RB H, including RB H soils, to that which is consistent with assumptions in the RB H RRE. DOE or its successors would retain the right and responsibility to monitor, maintain, and enforce these institutional controls. In order to maintain protection for human health and the environment at RB H in the future, the institutional controls to be adopted would:

- ▶ Ensure that industrial land use is maintained;
- ▶ Prohibit the use of bedrock ground water;
- ▶ Provide site access for federal and state agencies for the purpose of taking response actions, including sampling and monitoring; and
- ▶ Prohibit removal of RB H soils from the DOE Mound property (as owned in 1998) boundary without approval from ODH and OEPA , or their successor agencies.

## **2.10 Selected Remedy**

### **2.10.1 Description**

The selected remedy for RB H is institutional controls in the form of deed restrictions on future land use. The specific restrictions to be adopted are provided in the deed attached to this ROD as Appendix A. The objective of these restrictions is to:

- ▶ Ensure that industrial land use is maintained;
- ▶ Prohibit the use of bedrock ground water;
- ▶ Provide site access for federal and state agencies for the purpose of taking response actions including sampling and monitoring; and
- ▶ Prohibit removal of RB H soils from the DOE Mound property (as owned in 1998) boundary without approval from ODH and OEPA , or their successor agencies.

DOE or its successors, as the lead agency for this ROD, has the responsibility to monitor, maintain and enforce these institutional controls. This responsibility includes the duty to conduct annual assessments of compliance with the deed restrictions and the duty to enforce the deed restrictions if any non-compliance is detected. The assessment and enforcement processes are outlined in Appendix C, which is intended to serve as a framework for implementation of operation and maintenance activities for the selected remedy. Within ninety (90) days of the date on which this ROD is signed, DOE shall submit to US EPA and Ohio EPA for their approval a formal proposal regarding operation and maintenance of the institutional controls. This proposal and the annual compliance assessments shall be considered primary documents under the Federal Facility Agreement. If DOE, US EPA and OEPA agree, the frequency of the compliance assessments can be changed at any time.

The soils within RB H have not been evaluated for any use other than on-site industrial use. Any off-site disposition of the RB H soil without proper handling, sampling, and management could create an unacceptable risk to off-site receptors. An objective of the preferred alternative is to prevent residual exposure to soils from RB H.

A copy of the deed is attached in Appendix A; this represents the remedy for RB H. DOE will develop an Operation and Maintenance Plan for the remedy. US EPA and OEPA have approval authority for this plan.

## 2.10.2 Estimated Costs

The initial costs associated with these deed restrictions are those associated with the writing and recording of the restrictions with the deed. The costs associated with monitoring and enforcing the land use and property deed restrictions are estimated to be \$5,000 per year.

## 2.10.3 Decisive Factors

The US EPA has developed threshold, balancing and modifying criteria to aid in the selection of the remedy. There are two (2) threshold criteria, five (5) balancing criteria and two (2) modifying criteria. Each is described below.

### 2.10.3.1 THRESHOLD CRITERIA - *Must be met for an alternative to be eligible for selection:*

#### **(1) Overall protection of human health and the environment**

This criterion addresses whether an alternative provides adequate protection of human health and the environment. The "no action" alternative does not meet this criterion in that the level of risk to human health posed by the site was found to be acceptable only for an industrial scenario. No evaluation was made of the risks posed by unrestricted use of the property. Deed restrictions are required as a mechanism to ensure the continued future use of RB H is limited to industrial purposes.

#### **(2) Compliance with applicable or relevant and appropriate requirements**

Section 121(d) of CERCLA requires that remedial actions at CERCLA sites attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable Requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address hazardous substances, the remedial action to be implemented at the site, the location of the site, or other circumstances present at the site. Relevant and Appropriate

Requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law which, while not applicable to the hazardous materials found at the site, the remedial action itself, the site location, or other circumstances at the site, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well-suited to the site.

Compliance with ARARs addresses whether a remedy will meet all the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides the basis for invoking a waiver.

ARARs are of several types: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment. For RB H, "Maximum Contaminant Levels" or "MCLs" established under the Safe Drinking Water Act constitute chemical-specific ARARs and are listed in Appendix D. They apply to the bedrock ground water beneath RB H. No evidence of any contamination above MCLs has been found in this ground water. Consequently, ARARs with respect to ground water are deemed to have been met.

Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are located in specific locations, e.g., flood plains, wetlands, historic places, etc. For RB H, Ohio has identified two statutory provisions that describe site conditions that would prompt certain response actions. (See Appendix D). These provisions are similar to location-specific ARARs. The selected remedy meets both of these requirements.

Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. In this case, the remedy is an institutional control - deed restrictions. The ARARs are applicable State requirements concerning the recording of deeds. (See Appendix D). The selected remedy will comply with these requirements.

It should be noted that any onsite management of RB H soils, not associated

with a CERCLA response action, in a manner inconsistent with State law or any disposition of RB H soils away from the Mound Superfund Site would be subject to applicable Ohio regulations, which are independently enforceable from CERCLA.

**2.10.3.2 BALANCING CRITERIA** - *used to weigh major trade-offs among alternatives:*

**(1) Long-term effectiveness and permanence**

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk and the adequacy and reliability of controls. Only Alternative 2, Institutional Controls, provides some degree of long-term protectiveness. The implementation of institutional controls in the form of land use restrictions is necessary to ensure that future use remains compatible with the evaluated residual risk associated with RB H.

Because this remedy will result in hazardous substances remaining in the RB H above levels that allow for unlimited use and unrestricted exposure, an annual review and report will be submitted to OEPA, ODH, and US EPA (pursuant to CERCLA) determining whether or not the remedy is in effect and being complied with to ensure that it is adequately protective of human health and the environment.

DOE reserves the right to petition the US EPA, OEPA, and ODH for a modification to the frequency established for conducting the effectiveness reviews.

**(2) Reduction of toxicity, mobility or volume through treatment**

Reduction of toxicity, mobility or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of the remedy.

Since neither of the alternatives includes treatment, this criterion does not require further evaluation.

### **(3) Short-term effectiveness**

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers and the community during construction and operation of the remedy until clean-up goals are achieved.

Alternative 1, No Action, would not provide short-term effectiveness because there is no assurance of protection of human health and the environment after the property is transferred. Alternative 2, Institutional Controls, provides this assurance.

### **(4) Implementability**

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered. Since Alternative 1 involves no action, there is no time or cost required for implementation. Alternative 2, Institutional Controls, is expected to require approximately one month and minimal cost to implement.

### **(5) Cost**

The range of costs is zero dollars (\$0) for Alternative 1, No Action, to approximately \$5,000 annually for the maintenance of the deed restrictions for Alternative 2, Institutional Controls.

## **2.10.3.3 MODIFYING CRITERIA - *to be considered after public comment is received on the Proposed Plan and of equal importance to the balancing criteria:***

### **(1) State/Support Agency Acceptance**

Both US EPA and the State do not believe that Alternative 1, No Action, provides adequate protection of human health and the environment in the future. However, both agencies support the selected remedy, Alternative 2, Institutional Controls.

## **(2) Community Acceptance**

Based on input received during the public comment period and the public hearing, the community accepts and supports the selected remedy.

### **2.11 Statutory Determinations**

The selected remedy for RB H is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate (ARAR), is cost-effective, and utilizes a permanent solution to the maximum extent practicable. Because this remedy will result in hazardous substances remaining in Release Block H above levels that allow for unlimited use and unrestricted exposure, DOE in consultation with US EPA, Ohio EPA and ODH will review the remedial action each year to assure that human health and the environment are being protected by the remedial action being implemented.

DOE reserves the right to petition the US EPA, OEPA, and ODH for a modification to the frequency established for conducting the effectiveness reviews.

### **2.12 Documentation of Significant Changes**

Although this ROD has been signed, new information may be received or generated that could affect the implementation of the remedy. DOE, as the lead agency for this ROD, has the responsibility to evaluate the significance of any such new information. The type of documentation required for a post-ROD change depends on the nature of the change. Three categories of changes are recognized by the US EPA: non-significant, significant, and fundamental. Non-significant post-ROD changes may be documented using a memo to the Administrative Record file. Changes that significantly affect the ROD must be evaluated pursuant to CERCLA Section 117 and the NCP at 40 CFR 300.435(c)(2)(I). Fundamental changes typically require a revised Proposed Plan and an amendment to the ROD. Significant or fundamental changes to the ROD for Release Block H are not anticipated.

## **3.0 RESPONSIVENESS SUMMARY**

This section of the ROD presents stakeholder concerns about RB H and explains how those concerns were addressed prior to issuance of the ROD.

During the public meeting on the Proposed Plan, one stakeholder provided a formal comment. During the public review period for the Proposed Plan, other stakeholders

provided additional comments. The Core Team responded to stakeholders by letter. The comments and responses are also presented here.

- **Comments Received during the Public Meeting held on the Proposed Plan for Release Block H**

**Comment:**

My name is Jeff Fischer. I see that there's an update on risk factors from IRIS. That's a good thing. There are several chemicals as well as radionuclides that have updated factors. That brings up the question, what impact does this have on earlier work that's been done in terms of calculations? Has this been looked at for other release blocks?

**Response:**

The impact of revised risk factors from IRIS and HEAST on earlier work has been evaluated. Release Block D was the only release block affected because it was the only release block with a completed residual risk evaluation. The "Technical Position Report in Support of the Release Block D Residual Risk Evaluation" (January, 1999) documented the impact of revisions in risk factors that occurred after the Residual Risk Evaluation was complete (December, 1996).

- **Comments on the Technical Position Report in Support of the Release Block H Residual Risk Evaluation and the Proposed Plan for Release Block H**

Comment:

Add RfD (Table 2-1) to the Acronym List.

Response:

RfD will be added to the Acronym List on the final TPR.

Comment:

Note that the daughter product of Thorium 232 is Radium 228, rather than Radium 226 (page 6 and page 8). Likewise, the eventual daughter product of Uranium 238 is Radium 226.

Response:

The original RRE incorrectly stated that radium-226 was the daughter of thorium-232. This was one of the drivers for using the TPR to document the risks from radium-226 and its daughters. Radium-226 risks are therefore accounted for in the risk values presented in the ROD. The final edition of the TPR has been reworded to clarify this point.

Comment:

It is my thinking that the risk factors (for radionuclides) from inhalation, ingestion, and external exposure should be totaled for a more accurate risk figure. Also, in the face of the additional risk from hazardous chemicals -- does each of the two categories not enhance the effect of the other?

Response:

The risk factors for radionuclides have been totaled for all pathways (see for example Tables 3-1a and 3-1b of the TPR). Overall cancer risks for radionuclides and chemicals have also been totaled (see for example Tables 6.1 and 6.2 of the Proposed Plan). The overall cancer risk and the overall hazard index (for chemicals that are not carcinogens), however, have not been totaled; there is no consensus method available for summing these different figures-of-merit which represent very different types of potential health effects. Similarly, there is no consensus method available for estimating the synergistic effects possibly associated with exposure to both radionuclides and chemicals.

**Comment:**

Genetic effects were not included in the risk calculations, as far as I could see. These may have been ruled out due to the two categories of persons considered in the calculations. However, should a genetic defect appear in any of their families, this is a painful experience should it happen within future generations.

**Response:**

The comment is correct in noting that genetic effects are not accounted for in the HEAST slope factors used to translate intake of, or external exposure to, radionuclides into risk. The slope factors account solely for the additional cancer risk potentially associated with ingestion, inhalation, or external exposure using a linear, non-threshold dose-response model. The IRIS slope factors used for chemical carcinogens are also subject to this limitation.

**Comment:**

The "Core Team" of representatives from DOE, US EPA, and OEPA evaluated the potential contamination problems and recommended "the appropriate response." My question is: were any citizens involved in determining that response? Would a meeting for those persons interested in reviewing the contamination problems and recommendations be feasible? A simple explanation of how the calculations were made would be helpful to me.

**Response:**

The Core Team welcomes the opportunity to meet with citizens and discuss the Mound 2000 process and its results. The community was an active participant in developing this process (Mound 2000) and helped determine points of direct involvement. The Residual Risk Evaluation Methodology and the Residual Risk Evaluation for Release Block H have gone through a public comment cycle and copies are in the CERCLA Public Reading Room. The process requires comments from the public on the PRS recommendations be responded to or incorporated as part of the remedy evaluation. DOE believes all comments have been resolved with the commenter and the documents, comments, and responses have been placed in the CERCLA Public Reading Room.

**Comment:**

Before considering the transfer of more parcels, I would like to know if any historical records or deeds were searched to determine whether or not some record exists which would encourage us to honor the Miami Indian culture in some way.

Response:

Archeological field surveys have been performed. In 1987, Wright State University conducted archeological survey of the acceptable portions of the South Property (RB A & B). Based on the results of the field work and a review of applicable literature, the survey team concluded that the South Property did not have the research potential to make it eligible for listing on the National Register of Historic Places. Subsequent correspondence from the Ohio Historic Preservation office reaffirmed that conclusion. A follow-up survey conducted in 1991 examined areas immediately adjacent to, but not including the South Property. Four historic sites were noted: a segment of the Miami-Erie Canal, a bridge remnant, a bridge, and a city well. None of these sites were judged to be eligible for the National Register of Historic Places.

Comment:

The estimate of \$5000 as a fund to be used for the future monitoring of Parcel H seems to me to be an underestimation, since the cost of lab tests, etc., is substantial.

Response:

The referenced estimate of \$5000 per year is the anticipated annual cost of maintaining deed restrictions and performing effectiveness reviews for USEPA and OEPA as described in the Proposed Plan. Any required future monitoring within this RB would be funded separately.

Comment:

The party which purchases Release Block H should commit, as well, when he/she transfers the site to another owner, to the transfer of all existing environmental reports provided by DOE. In addition, to the succeeding owners, all records should be filed with the City of Miamisburg Records of Deeds Office, the County Zoning Board, and the Ohio Records Offices and federal agencies so designated.

Response:

We share your concern for long term retention and dissemination of information about the site. The Federal Facility Agreement addresses document retention for at least 10 years after termination of the FFA. As the Mound project continues and approaches completion, we will revisit the issue of long term retention and dissemination of information to succeeding owners.

Comment:

We understand that a professional property survey has been completed for Release Block H. Will the complete legal description of Release Block H, with a thorough description of the property boundaries, be included in the Release Block H Record of Decision?

Response:

The complete legal description of Release Block H will be included in the Record of Decision as an Appendix.

Comment:

We wish to clarify the term "industrial use" or "industrial land use" as it appears in the Proposed Plan. The first sentence of Section 3.0, Exposure Assessment, of the Release Block H Residual Risk Evaluation (RRE) states that "[DOE], Ohio EPA, U.S. EPA, and the Mound Facility stakeholders have agreed that the future use of the Mound Plant property will be commercial/industrial use." The section then goes on to describe the two commercial/industrial exposure scenarios utilized in the RRE and defined in the Mound 2000 Residual Risk Evaluation Methodology as 1) a construction worker assumed to work on the property eight hours per day for 250 days per year over a five-year period, and 2) a site employee assumed to work for eight hours per day for 250 days per year over a 25-year period and who does not shower in water from a well on the property.

We assume, therefore, based on the foregoing scenarios, that the use of the term "industrial" in the Release Block H Proposed Plan refers to the risk exposure scenario evaluated for this property and is not restricted solely to the industrial land use category, but incorporates both commercial and industrial land uses. Are our assumptions correct?

Response:

Yes, your assumptions are correct. "Industrial" refers to the risk exposure scenario evaluated for the property. This incorporates both commercial and industrial land uses that are consistent with the restrictions placed on the deed and as described in the ROD.

Comment:

The fourth sentence of the second paragraph of Page 3 should read something like "Before transfer of a release block can be completed, all buildings and PRSs must be evaluated for protectiveness to human health and the environment for industrial reuse or be remediated to be protective." The word protectiveness is not defined at a previous point in the text.

Response:

This language has been incorporated into the appropriate section (2.4 Scope and Role of RB H) of the Record of Decision.

Comment:

A wedge of Release Block H property lies outside (east of) the Mound facility fence line along Mound Road, between the Mound entrance driveway and Mound Road itself, and one corner of property lies to the east of Mound Road. (Refer to Attachment A for a map of the wedge of Release Block H property and to Attachment B for a legal description.) MMCIC believes that the Miamisburg community would receive a benefit from an exclusion from the soil removal restriction for this wedge of property as described below.

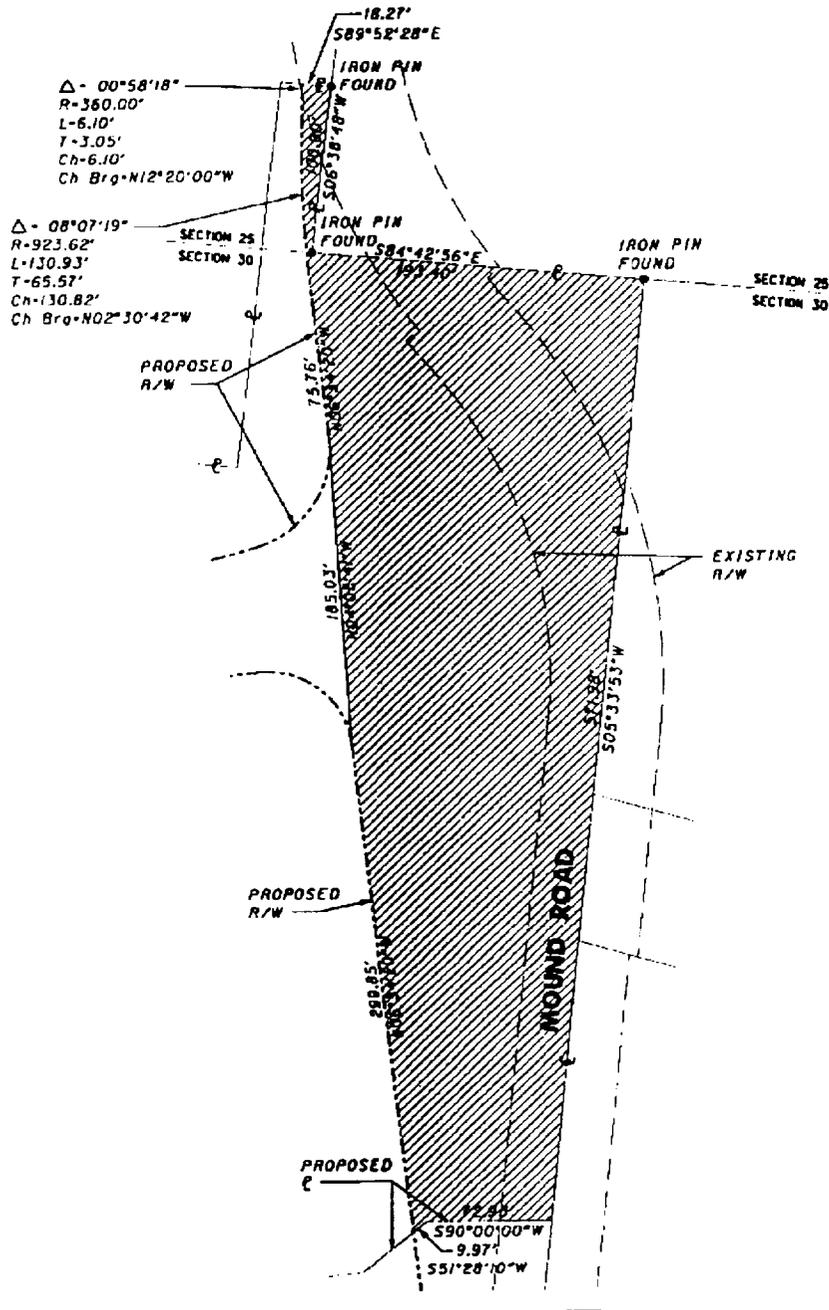
Once MMCIC completes its proposed improvement along the section of Mound Road that includes this wedge of Block H property, MMCIC plans to dedicate the road to the City of Miamisburg. Any maintenance or improvements required for the road after that time will become the responsibility of the City. A soil removal restriction for this wedge of property along Mound Road will be extremely difficult to police once the road is dedicated to the City.

Historical information described in the Release Block H Proposed Plan confirms that no industrial, commercial, or research activities associated with the Mound facility operations ever took place on this portion of Release Block H.

In addition, MMCIC has reviewed the soil sample analytical data for the described wedge of property. The analytical data, which for the most part result from laboratory analyses for radionuclides, indicate concentrations that are either equal to the method detection limits (i.e., non-detects) or within the 10-5 Guideline Values for a residential scenario established for the respective compounds at the Mound facility. There are two exceptions to these observations: Cesium-137 detected at 0.6 pCi/g and Plutonium-238 detected at 26 pCi/g.

MMCIC therefore requests that, if necessary, a focused residential residual risk evaluation be performed to support an exclusion from the soil removal restriction for the described wedge of property in Release Block H.

ATTACHMENT A



ATTACHMENT B  
DESCRIPTION FOR SOIL EXCLUSION AREA  
6.604 ACRES

Situate in the County of Montgomery, in the State of Ohio and in the City of Miamisburg, part of Section 25, Town 1, Range 6 MRs and part of Section 30, Town 2, Range 5 MRs and being more particularly described as follows: **Commencing** at an iron pin found on the southerly projection of the centerline of Mound Road, said point also being the northeast corner of a 164.13 Acre tract of land as described in Deed Book 1246, Page 45 of the Deed Records of Montgomery County and being the **TRUE POINT OF BEGINNING**,

thence South 06° 38' 48" West, 100.00 feet to an iron pin found; thence South 84° 42' 56" East, 193.40 feet to an iron pin found; thence South 05° 33' 53" West, 571.98 feet to a point on the centerline of Mound Road; thence due West, 72.93 feet to a point; thence South 51° 28' 10" West, 9.97 feet to a point on the proposed westerly right-of-way of Mound Road; thence along the proposed westerly right-of-way of Mound Road, North 06° 34' 20" West, 299.85 feet to a point; thence North 04° 05' 41" West, 185.03 feet to a point; thence along the proposed westerly right-of-way of Mound Road, North 06° 34' 20" West, 75.76 feet to a point; thence along the proposed westerly right-of-way of Mound Road, on a curve to the right for a distance of 130.93 feet with a radius of 923.62 feet and a central angle of 08° 07' 19" and a chord distance of 130.82 feet and a chord bearing of North 02° 30' 42" West to a point; thence along the existing westerly right-of-way of Mound Road, on a non-tangent curve to the right for a distance of 6.10 feet with a radius of 360.00 feet and a central angle of 00° 58' 18" and a chord distance of 6.10 feet and a chord bearing of North 12° 20' 00" West to a point; thence South 89° 52' 28" East, 18.27 feet to the **POINT OF BEGINNING**.

Containing 287,684.98 square feet, 6.604 acres more or less, and subject to all legal highways, easements, and agreements of record.

**Response:**

To respond to this comment, it was necessary to review the soil data for the referenced "wedge". Based on that review, two contaminants of concern (COCs) were identified. A risk analysis was then performed using those two COCs. The analysis bounded the risks from the uncontrolled release of the "wedge" soil by assuming the soils were relocated to a residential area. The risk results were used to determine if the deed restriction was required to protect human health and the environment. Results and conclusions are summarized below.

**Contaminants of concern.** The data review confirmed that the plutonium-238 value of 26 pCi/g was the highest Pu-238 result reported in and around the "wedge". It is important to note that the value was generated using soil screening instruments that have a plutonium-238 detection limit of about 25 pCi/g. Therefore, actual Pu-238 concentrations in the area, as documented by measurements made with more sensitive instruments, were much lower ( $\leq 3.9$  pCi/g). However, in the interest of conservatism, the 26-pCi/g result was used to evaluate the residual risks potentially associated with exposure to Pu-238 in the soil. (Note that a 95% upper confidence level was not calculated as fewer than 20 Pu-238 results were available.)

The cesium-137 value of 0.6 pCi/g was also found to be an appropriate bounding concentration. The highest measured Cs-137 concentration was outside, but in proximity to, the boundaries of the wedge. For cesium, a 95% upper confidence level was not calculated as fewer than 20 cesium-137 results were available.

All other radionuclide results were at or below their respective background levels. Specifically, isotopes of radium, thorium, and uranium were detected, but in concentrations that did not warrant inclusion in this analysis.

**Risk analysis.** The analysis assumed an individual would incidentally consume and ingest soils from the wedge. The same individual was assumed to receive external exposure from the soil and to ingest additional radioactivity via transfer of the contaminants from the soil to produce grown in a home garden. The results of the risk analysis are shown in the following two tables.

## Table 1. Release Block "H" Wedge Risk Analysis for Pu-238

### Risk Calculations for Pu-238 Soil Inhalation, Soil Ingestion, External Exposure, and Consumption of Produce from a Home Garden

(Ref: Equation and parameter values from Risk-Based Guideline Values, March 1997)

#### Maximum Pu-238 Soil Concentration

26 pCi/g Concentration (Location SCR974 – in the center of the RB H "wedge")

#### Slope Factors

2.95E-10 risk/pCi ingested  
2.74E-08 risk/pCi inhaled  
1.94E-11 risk/yr/pCi/g

#### Risk: Residential Soil Ingestion

Risk = CS \* EF \* [(IRc\*EDc)+(IRa\*EDa)] \* ING SF  
CS = 26 pCi/g (CS = concentration in soil)  
EF = 350 days/year (EF = exposure frequency)  
IRc = 0.2 g/day (IRc = child ingestion rate)  
EDc = 6 years (EDc = child exposure duration)  
IRa = 0.1 g/day (IRa = adult ingestion rate)  
EDa = 24 years (EDa = adult exposure duration)  
ING SF = 2.95E-10 risk/pCi ingested

Risk = 9.66E-06

#### Risk: Residential Soil Inhalation

Risk = CS \* EF \* ED \* IR \* (1/PEF) \* INH SF \* 1000 g/kg  
CS = 26 pCi/g (CS = concentration in soil)  
EF = 350 days/year (EF = exposure frequency)  
ED = 30 years (ED = exposure duration)  
IR = 20 m<sup>3</sup>/day (IR = inhalation rate)  
PEF = 4.28E+09 m<sup>3</sup>/kg (PEF = particulate emission factor)  
INH SF = 2.74E-08 risk/pCi inhaled

Risk = 3.50E-08

#### Risk: Residential External Exposure

Risk = CS \* ED \* (1-SE) \* TE \* EXT SF  
CS = 26 pCi/g  
ED = 30 yr (ED = exposure duration)  
SE = 0.2 unitless (SE = gamma shielding factor)  
TE = 0.375 unitless (TE = gamma exposure time factor)  
EXT SF = 1.94E-11 risk/yr/pCi/g (EXT SF = external slope factor)

Risk = 4.54E-09

#### Risk: Residential Home Garden

Risk = CS \* BV \* IR \* FI \* EF \* ED \* ING SF  
CS = 26 pCi/g (CS = concentration in soil)  
BV = 5.0E-04 unitless (BV = soil-to-plant concentration factor for plutonium)  
IR = 340 g/day (IR = produce ingestion rate)  
FI = 0.36 unitless (FI = fraction of produce from home garden)  
EF = 350 days/year (EF = exposure frequency)

ED = 30 years (ED = exposure duration)  
ING SF = 2.95E-10 risk/pCi ingested (ING SF = ingestion slope factor)  
Risk = 4.93E-06

**Pu-238 Risk Summary for Residential Use of RB H Wedge Soil**

	Risk
Soil ingestion	9.66E-06
Soil inhalation	3.50E-08
External exposure	4.54E-09
<u>Home-grown produce</u>	<u>4.93E-06</u>
<b>Total</b>	<b>1.46E-05</b>

## Table 2. Release Block "H" Wedge Risk Analysis for Cs-137

### Risk Calculations for Cs-137+D Soil Inhalation, Soil Ingestion, External Exposure, and Consumption of Produce from a Home Garden

(Ref: Equation and parameter values from Risk-Based Guideline Values, March 1997)

#### Cs-137 Soil Concentration

0.6 pCi/g Maximum concentration (Location S0219 – just outside the RB H "wedge")  
 1.02 pCi/g Total concentration (including background value of 0.42 pCi/g)

#### Slope Factors

3.16E-11 risk/pCi ingested  
 1.91E-11 risk/pCi inhaled  
 2.09E-06 risk/yr/pCi/g

#### Risk: Residential Soil Ingestion

Risk = CS \* EF \* [(IRc\*EDc)+(IRa\*EDa)] \* ING SF  
 CS = 1.02 pCi/g (CS = concentration in soil)  
 EF = 350 days/year (EF = exposure frequency)  
 IRc = 0.2 g/day (IRc = child ingestion rate)  
 EDc = 6 years (EDc = child exposure duration)  
 IRa = 0.1 g/day (IRa = adult ingestion rate)  
 EDa = 24 years (EDa = adult exposure duration)  
 ING SF = 3.16E-11 risk/pCi ingested

Risk = 4.06E-08

#### Risk: Residential Soil Inhalation

Risk = CS \* EF \* ED \* IR \* (1/PEF) \* INH SF \* 1000 g/kg  
 CS = 1.02 pCi/g (CS = concentration in soil)  
 EF = 350 days/year (EF = exposure frequency)  
 ED = 30 years (ED = exposure duration)  
 IR = 20 m<sup>3</sup>/day (IR = inhalation rate)  
 PEF = 4.28E+09 m<sup>3</sup>/kg (PEF = particulate emission factor)  
 INH SF = 1.91E-11 risk/pCi inhaled

Risk = 9.56E-13

#### Risk: Residential External Exposure

Risk = CS \* ED \* (1-SE) \* TE \* EXT SF  
 CS = 1.02 pCi/g  
 ED = 30 yr (ED = exposure duration)  
 SE = 0.2 unitless (SE = gamma shielding factor)  
 TE = 0.375 unitless (TE = gamma exposure time factor)  
 EXT SF = 2.09E-06 risk/yr/pCi/g (EXT SF = external slope factor)

Risk = 1.92E-05

**Risk: Residential Home Garden**

Risk = CS \* BV \* IR \* FI \* EF \* ED \* ING SF  
CS = 1.02 pCi/g (CS = concentration in soil)  
BV = 4.0E-02 unitless (BV = soil-to-plant concentration factor for cesium)  
IR = 340 g/day (IR = produce ingestion rate)  
FI = 0.36 unitless (FI = fraction of produce from home garden)  
EF = 350 days/year (EF = exposure frequency)  
ED = 30 years (ED = exposure duration)  
ING SF = 3.16E-11 risk/pCi ingested (ING SF = ingestion slope factor)

**Risk = 1.66E-06**

**Cs-137 Risk Summary for Residential Use of RB H Wedge Soil**

	Risk
Soil ingestion	4.06E-08
Soil inhalation	9.56E-13
External exposure	1.92E-05
Home-grown produce	1.66E-06
<b>Total</b>	<b>2.09E-05</b>

**Results and conclusions.** Based on the conservative exposure scenarios detailed above, the absence of a restriction on the movement of RB H "wedge" soils would not present an unacceptable risk to a member of the public. In addition, the RB H "wedge" was not used as a process area, is located outside the controlled (security fence) area, has had no reported releases, and has no anomalous locations identified by qualitative field instrumentation. Therefore, the DOE and the US and Ohio EPAs concur with the request from MMCIC to lift the restriction and the appropriate notations appear elsewhere in this ROD, however OEPA and ODH recommend that any surplus soils from this area be used or kept on the Mound property to eliminate any future concerns regarding disposition of soil.

#### **4.0 ADMINISTRATIVE RECORD FILE REFERENCES**

Information used to select the remedy is contained in the Administrative Record file. The file is available for review at the Mound CERCLA Reading Room, Miamisburg Senior Adult Center, 305 Central Avenue, Miamisburg, Ohio. The Administrative Record File references for RB H includes the following:

An Archaeological Survey of Portions of the Mound Facility, Montgomery County, Ohio, Public Archaeology Report No. 18, Laboratory of Anthropology, Wright State University, December, 1987.

Literature Review Update and Archaeological Survey of the EG&G Mound Facility and Adjacent Areas, City of Miamisburg, Miami Township, Montgomery County, Ohio, April 16, 1991.

Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan, Final, May 1992.

Operable Unit 9 Site Scoping Report, Volume 3 - Radiological Site Survey, Final, June 1, 1993.

Operable Unit 9; Hydrogeologic Investigation: Bedrock Report, Technical Memorandum, Revision 0, January 1994.

Operable Unit 9; Ecological Characterization; Technical Memorandum, Revision 0, March 1994.

Operable Unit 9; Hydrogeologic Investigation: Buried Valley Aquifer Report, Technical Memorandum, Revision 1, September 1994.

Operable Unit 9 Background Soils Investigation Soil Chemistry Report, Technical Memorandum, Revision 2, September 1994.

Operable Unit 9 Hydrogeologic Investigation: Groundwater Sweeps Report, Technical Memorandum, April, 1995.

Other Soils Characterization Report, Volume I - Text. Final, Revision 0. May 1, 1995.

Operable Unit 9 Regional Soils Investigation Report, Revision 2, August 1, 1995.

Potential Release Site Package, PRS #93, Final, Revision 2, November 1996.

Residual Risk Evaluation, Release Block H, August 1997.

The Mound 2000 Residual Risk Evaluation Methodology (RREM), Mound Plant, Final, Revision 0, January 6, 1997.

Workplan for Environmental Restoration at the Mound Plant, The Mound 2000 Approach, December 1998.

Memorandum, Randolph Tormey, Deputy Chief Counsel, Ohio Field Office, US DOE dated February 17, 1999 regarding Institutional Controls, Mound Facility, Miamisburg, Ohio.

Letter from Mr. Timothy J. Fischer, Remedial Project Manager, US EPA to Mr. Arthur Kleinrath, US DOE dated April, 1999, RE: Ecological Risk Assessment, Release Block H.

Letter from Mr. Brian Nickel, Mound Project Manager, Office of Federal Facilities and Oversight, OEPA to Mr. Oba Vincent, US DOE dated April, 1999, RE: DOE Mound Release Block H Ecological Assessment.

Technical Position Report In Support of the Release Block H Residual Risk Evaluation, Public Review Draft, Rev 2, April 1999.

**Appendix A**

**Quitclaim Deed for RB H**

## QUITCLAIM DEED

The UNITED STATES OF AMERICA, acting by and through the Secretary of the Department of Energy (hereinafter sometimes called "Grantor"), under and pursuant to the authority of the Atomic Energy Act of 1954, Section 161 (g) (42 U.S.C. §2201(g), the covenants contained herein, and other good and valuable consideration, duly paid by the Miamisburg Mound Community Improvement Corporation, a non-profit corporation subsisting under the laws of Ohio and recognized by the Secretary of Energy as the agent for the community wherein the former Mound Facility is located (hereinafter sometimes called "Grantee"), the receipt of which is hereby acknowledged, hereby QUITCLAIMS unto Grantee its successors and assigns, subject to the reservations, covenants, and conditions hereinafter set forth, all of its right, title and interest, together with all improvements thereon and appurtenances thereto, in the following described premises, commonly known as Parcel H:

Situate in the State of Ohio, County of Montgomery, being in the City of Miamisburg, being part of Section 30, Range 5, Township 2, lying in the Miami Rivers Survey (M.R.S.), and being part of city lots numbered 2259 within the Corporation Limits of the City of Miamisburg, and being more particularly bounded and described with bearings referenced to the Ohio State Coordinate System, South Zone, as follows:

Beginning at a concrete monument, being the North East corner of Section 36 and the North West corner of Section 30, and being the point of beginning for the land herein described, thence S 5° 47' 45" W 130.89 feet to an iron pin being the TRUE POINT OF BEGINNING; thence S 85° 03' 12" E 1023.90 feet to a concrete monument, thence N 6° 54' 59" E 231.00 feet to a concrete monument, thence S 84° 36' 50" E 30.00 feet to a iron pin, thence S 6° 54' 54" W 100.00 feet to a iron pin, thence S 84° 36' 37" E 193.40 feet to a concrete monument, thence S 5° 34' 19" W 571.986 feet along the center line of Mound Road to a point, thence S 90° 0' 0" W 72.86 feet to a point, thence S 51° 28' 1.6" W 48.51 feet to a point, thence S 83° 32' 4" W 97.29 feet to a point, thence S 63° 48' 53" W 98.67 feet to a point, thence N 89° 55' 58" W 173.02 feet to a point, thence N 83° 49' 39" W 244.21 feet to a point, thence along the arc of a curve to the right having a radius of 360.67 feet for a distance of 353.12 feet to a point, thence N 25° 03' 02" W 214.48 feet to a point, thence S 64° 03' 10" W 37.94 feet to a point, thence N 64° 35' 31" W 56.61 feet to a point, thence N 25° 43' 03" W 160.76 feet to a point, thence N 65° 33' 00" E 35.05 feet to a point, thence N 5° 31' 01" E 57.67 feet to a iron pin being the true point of beginning containing 14.29 acres more or less, and subject to all legal highways and easements of record. Prior Deed Reference: Deed Book \_\_\_\_\_, Page \_\_\_\_.

RESERVING UNTO Grantor, the United States Environmental Protection Agency (USEPA) and the State of Ohio, acting by and through the Director of the Ohio Environmental Protection Agency (OEPA) or the Ohio Department of Health (ODH), their successors and assigns, an easement to, upon or across the Premises in conjunction with the covenants of

Grantor and/or Grantee in paragraphs numbered 1.1-1.3, 3.2 and 3.3 of this Deed and as otherwise needed for purposes of any response action as defined under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, including but not limited to, environmental investigation or remedial action on the Premises or on property in the vicinity thereof, including the right of access to, and use of, to the extent permitted by applicable law, utilities at reasonable cost to Grantor. Grantee understands that any such response action will be conducted in a manner so as to attempt to minimize interfering with the ordinary and reasonable use of the Premises.

This Deed and conveyance is made and accepted without warranty of any kind, either express or implied, except for the warranty in paragraph 3.3 of this Deed, and is expressly made under and subject to all reservations, restrictions, rights, covenants, easements, licenses, and permits, whether or not of public record, to the extent that the same affect the Premises.

1. The parties hereto intend the following restrictions and covenants to run with the land and to be binding upon the Grantee and its successors, transferees, and assigns or any other person acquiring an interest in the Premises, for the benefit of Grantor, USEPA and the State of Ohio, acting by and through the Director of OEPA or ODH, their successors and assigns.
  - 1.1 Excepting those soils **Commencing** at an iron pin found on the southerly projection of the centerline of Mound Road, said point also being the northeast corner of a 164.13 Acre tract of land as described in Deed Book 1246, Page 45 of the Deed Records of Montgomery County and being the **TRUE POINT OF BEGINNING**, thence South  $06^{\circ} 38' 48''$  West, 100.00 feet to an iron pin found; thence South  $84^{\circ} 42' 56''$  East, 193.40 feet to an iron pin found; thence South  $05^{\circ} 33' 53''$  West, 571.98 feet to a point on the centerline of Mound Road; thence due West, 72.93 feet to a point; thence South  $51^{\circ} 28' 10''$  West, 9.97 feet to a point on the proposed westerly right-of-way of Mound Road; thence along the proposed westerly right-of-way of Mound Road, North  $06^{\circ} 34' 20''$  West, 299.85 feet to a point; thence North  $04^{\circ} 05' 41''$  West, 185.03 feet to a point; thence along the proposed westerly right-of-way of Mound Road, North  $06^{\circ} 34' 20''$  West, 75.76 feet to a point; thence along the proposed westerly right-of-way of Mound Road, on a curve to the right for a distance of 130.93 feet with a radius of 923.62 feet and a central angle of  $08^{\circ} 07' 19''$  and a chord distance of 130.82 feet and a chord bearing of North  $02^{\circ} 30' 42''$  West to a point; thence along the existing westerly right-of-way of Mound Road, on a non-tangent curve to the right for a distance of 6.10 feet with a radius of 360.00 feet and a central angle of  $00^{\circ} 58' 18''$  and a chord distance of 6.10 feet and a chord bearing of North  $12^{\circ} 20' 00''$  West to a point; thence South  $89^{\circ} 52' 28''$  East, 18.27 feet to the **POINT OF BEGINNING**.

Containing 287,684.98 square feet, 6.604 acres more or less, and subject to all legal highways, easements, and agreements of record. Grantee covenants that any soil from the Premises shall not be placed on any property outside the boundaries of that described in instruments recorded at Deed Book (1214, pages 10, 12, 15, 17 and 248; Deed Book 1215, page 347; Deed Book 1246, page 45; Deed Book 1258, pages 56 and 74; Deed Book 1256, page 179; Micro-Fiche 81-376A01; and Micro-Fiche

**81-323A11)** of the Deed Records of Montgomery County, Ohio (and as illustrated in the CERCLA 120(h) Summary, Notices of Hazardous Substances Release Block H, Mound Plant, Miamisburg, Ohio dated \_\_\_\_\_, 1999) without prior written approval from ODH and OEPA, or successor agencies.

- 1.2 Grantee covenants not to use, or allow the use of, the Premises for any residential or farming activities, or any other activities which could result in the chronic exposure of children under eighteen years of age to soil or groundwater from the Premises. Restricted uses shall include, but not be limited to:

- (1) single or multifamily dwellings or rental units;
- (2) day care facilities;
- (3) schools or other educational facilities for children under eighteen years of age; and
- (4) community centers, playgrounds, or other recreational or religious facilities for children under eighteen years of age.

Grantor shall be contacted to resolve any questions which may arise as to whether a particular activity would be considered a restricted use.

- 1.3 Grantee covenants not to extract, consume, expose, or use in any way the groundwater underlying the premises without the prior written approval of the United States Environmental Protection Agency (Region V) and the OEPA.
2. The Grantor hereby grants to the State of Ohio and reserves and retains for itself, its successors and assigns an irrevocable, permanent, and continuing right to enforce the covenants of this Quitclaim Deed through proceedings at law or in equity, including resort to an action for specific performance, as against and at the expense of Grantee, its successors and assigns, including reasonable legal fees, and to prevent a violation of, or recover damages from a breach of, these covenants, or both. Any delay or forbearance in enforcement of said restrictions and covenants shall not be deemed to be a waiver thereof.
3. Pursuant to Section 120(h)(3) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. §9620(h)(3)), the following is notice of hazardous substances, the description of any remedial action taken, and a covenant concerning the Premises.
- 3.1 **Notice of Hazardous Substance:** Grantor has made a complete search of its files and records concerning the Premises. Those records indicate that the hazardous substances listed in Exhibit "B," attached hereto and made a part hereof, have been stored for one year or more or disposed of on the Premises and the dates that such storage/disposal took place.
- 3.2 **Description of Remedial Action Taken:** Institutional Controls are established. The Institutional Controls are set forth as covenants in Sections 1.1, 1.2, and 1.3 of this Deed.

- 3.3 **Covenant:** Grantor covenants and warrants that all remedial action necessary for the protection of human health and the environment with respect to any hazardous substances remaining on the property has been taken, and any additional remedial action found to be necessary after the date of this Deed regarding hazardous substances existing prior to the date of this Deed shall be conducted by Grantor, provided, however, that the foregoing covenant shall not apply in any case in which the presence of hazardous substances on the property is due to the activities of Grantee, its successors, assigns, employees, invitees, or any other person subject to Grantee's control or direction.
4. Unless otherwise specified, all the covenants, conditions, and restrictions to this Deed shall be binding upon, and shall inure to the benefit of the assigns of Grantor and the successors and assigns of Grantee.

**IN WITNESS WHEREOF**, the United States of America, acting by and through its Secretary of the Department of Energy, has caused these presents to be executed this \_\_\_\_\_ day of \_\_\_\_\_, 1999.

UNITED STATES OF AMERICA

WITNESSETH:

\_\_\_\_\_  
 \_\_\_\_\_

State of Ohio )  
 County of Montgomery ) SS.

Before me, a Notary Public in and for said State and County, appeared this \_\_\_\_ day of \_\_\_\_\_, 1999, \_\_\_\_\_, who acknowledged that she is the Manager of the Ohio Field Office for the United States Department of Energy, with full authority to execute the foregoing on behalf of the United States of America, and who acknowledged the above to be her signature and her free act and deed.

SEAL

\_\_\_\_\_  
 \_\_\_\_\_ Notary Public

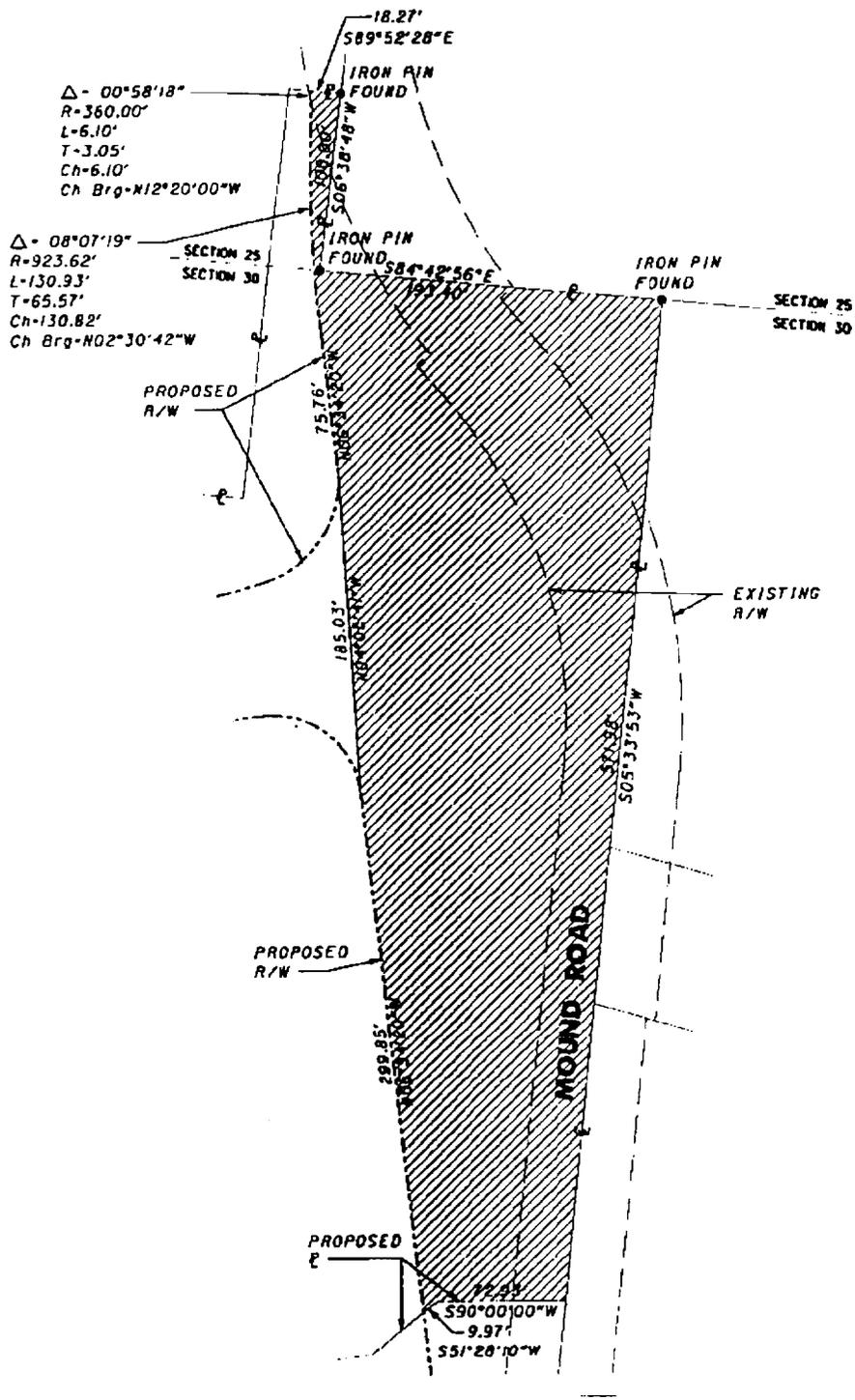
**Appendix B**  
**Legal Description of RB H**

## H "Wedge"

Situate in the County of Montgomery, in the State of Ohio and in the City of Miamisburg, part of Section 25, Town 1, Range 6 MRs and part of Section 30, Town 2, Range 5 MRs and being more particularly described as follows: **Commencing** at an iron pin found on the southerly projection of the centerline of Mound Road, said point also being the northeast corner of a 164.13 Acre tract of land as described in Deed Book 1246, Page 45 of the Deed Records of Montgomery County and being the **TRUE POINT OF BEGINNING**,

thence South 06° 38' 48" West, 100.00 feet to an iron pin found; thence South 84° 42' 56" East, 193.40 feet to an iron pin found; thence South 05° 33' 53" West, 571.98 feet to a point on the centerline of Mound Road; thence due West, 72.93 feet to a point; thence South 51° 28' 10" West, 9.97 feet to a point on the proposed westerly right-of-way of Mound Road; thence along the proposed westerly right-of-way of Mound Road, North 06° 34' 20" West, 299.85 feet to a point; thence North 04° 05' 41" West, 185.03 feet to a point; thence along the proposed westerly right-of-way of Mound Road, North 06° 34' 20" West, 75.76 feet to a point; thence along the proposed westerly right-of-way of Mound Road, on a curve to the right for a distance of 130.93 feet with a radius of 923.62 feet and a central angle of 08° 07' 19" and a chord distance of 130.82 feet and a chord bearing of North 02° 30' 42" West to a point; thence along the existing westerly right-of-way of Mound Road, on a non-tangent curve to the right for a distance of 6.10 feet with a radius of 360.00 feet and a central angle of 00° 58' 18" and a chord distance of 6.10 feet and a chord bearing of North 12° 20' 00" West to a point; thence South 89° 52' 28" East, 18.27 feet to the **POINT OF BEGINNING**.

Containing 82,149.70 square feet, 1.886 acres more or less, and subject to all legal highways, easements, and agreements of record.



## Release Block H

Situate in the State of Ohio, County of Montgomery, being in the City of Miamisburg, being part of Section 30, and Section 36, Range 5, Township 2, lying in the Miami Rivers Survey (M.R.S.), and being part of city lots numbered 2258 and 2259 within the Corporation Limits of the City of Miamisburg, and being more particularly bounded and described with bearings referenced to the Ohio State Coordinate System, South Zone, as follows:

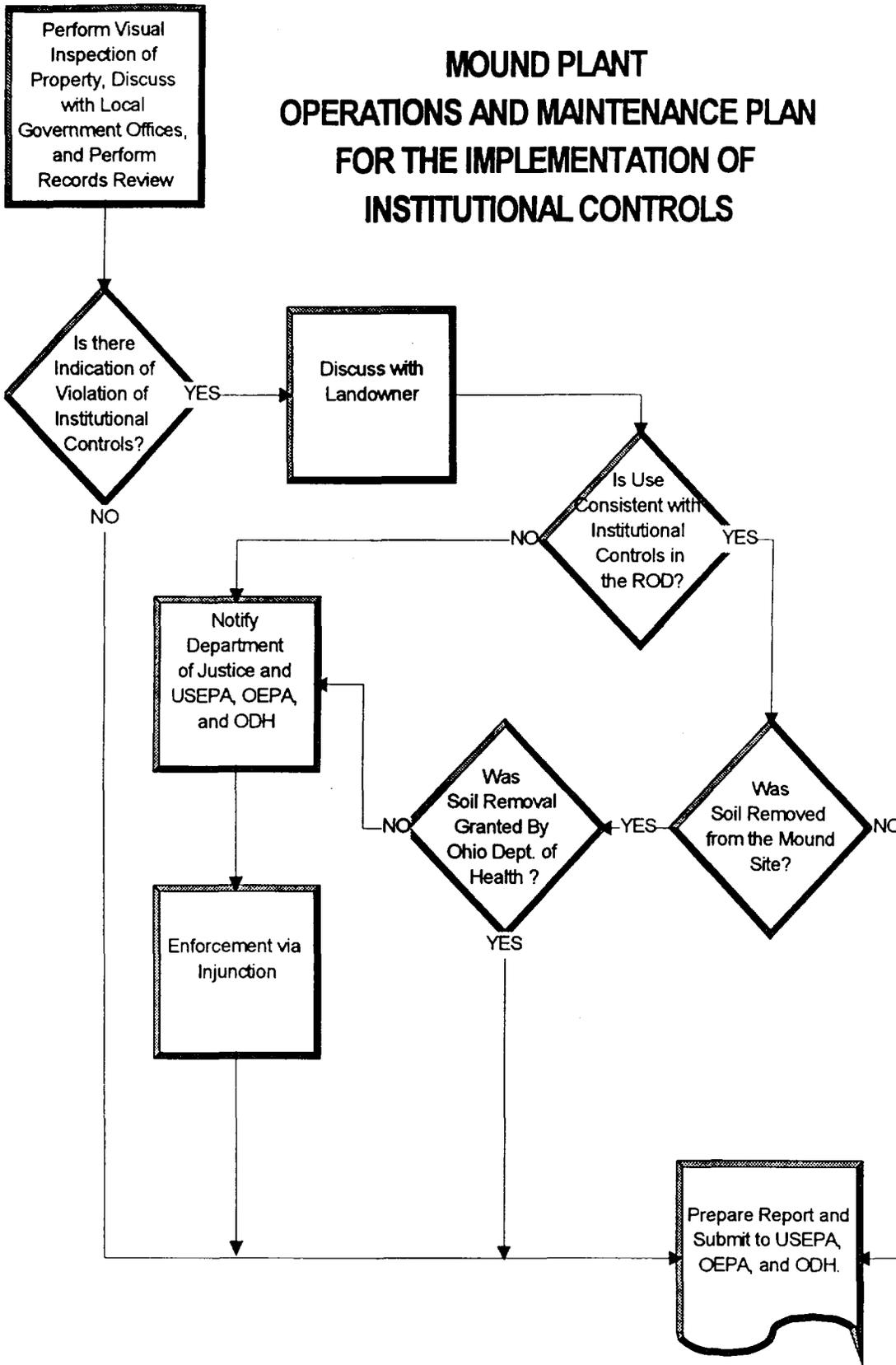
Beginning at a concrete monument, being the North East corner of Section 36 and the North West corner of Section 30, and being the point of beginning for the land herein described, thence S 5° 47' 45" W 130.89 feet to an iron pin being the TRUE POINT OF BEGINNING; thence S 85° 03' 12" E 1023.90 feet to a concrete monument, thence N 6° 54' 59" E 231.00 feet to a concrete monument, thence S 84° 36' 50" E 30.00 feet to a iron pin, thence S 6° 54' 54" W 100.00 feet to a iron pin, thence S 84° 36' 37" E 193.40 feet to a concrete monument, thence S 5° 34' 19" W 571.986 feet along the center line of Mound Road to a point, thence S 90° 0' 0" W 72.86 feet to a point, thence S 51° 28' 1.6" W 48.51 feet to a point, thence S 83° 32' 4" W 97.29 feet to a point, thence S 63° 48' 53" W 98.67 feet to a point, thence N 89° 55' 58" W 173.02 feet to a point, thence N 83° 49' 39" W 244.21 feet to a point, thence along the arc of a curve to the right having a radius of 360.67 feet for a distance of 353.12 feet to a point, thence N 25° 03' 02" W 214.48 feet to a point, thence S 64° 03' 10" W 37.94 feet to a point, thence N 64° 35' 31" W 56.61 feet to a point, thence N 25° 43' 03" W 160.76 feet to a point, thence N 65° 33' 00" E 35.05 feet to a point, thence N 5° 31' 01" E 57.67 feet to a iron pin being the true point of beginning containing 14.29 acres more or less, and subject to all legal highways and easements of record.



## **Appendix C**

### **Mound Plant Operations and Maintenance Plan for the Implementation of Institutional Controls**

# MOUND PLANT OPERATIONS AND MAINTENANCE PLAN FOR THE IMPLEMENTATION OF INSTITUTIONAL CONTROLS



## **Appendix D**

### **Listing of Applicable Relevant and Appropriate Requirements (ARARs)**

### **Chemical Specific ARARs**

- OAC 3745-81-11, Maximum Contaminant Levels for Inorganic Chemicals
- OAC 3745-81-12, Maximum Contaminant Levels for Organic Chemicals
- OAC 3745-81-13, Maximum Contaminant Levels for Turbidity
- OAC 3745-81-15, Maximum Contaminant Levels for Radium 226, 228,  
Gross Alpha
- OAC 3745-81-16, Maximum Contaminant Levels for Beta Particle & Photon  
Radioactivity

### **Location Specific ARARs**

- ORC 6111.03, Protection of Waters of the State
- ORC 3734.20, Description of OEPA Director's power for Protection of  
Public Health and the Environment

### **Action Specific ARARs**

- ORC 317.08, Criteria for County Recording of Deeds
- ORC 5301.25(A), Proper Recording of Land Encumbrances