

**Documentation of Environmental Indicator Determination
in Accordance with EPA Interim Final Guidance 2/5/99**

**RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo code (CA725)**

Current Human Exposures Under Control

Facility Name: Missouri Pressed Metals, Inc. (MPM)
Facility Address: 1200 East Boonville Road, Sedalia, MO 65302
Facility EPA ID #: MOD073029936

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

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

 If no - re-evaluate existing data, or

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

BACKGROUND

Definition of Environmental Indicators (for RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

While Final Remedies remain the long-term objective of the RCRA Corrective Action Program the EIs are near-term objectives which are currently being used as program

measures for the Government Performance and Results Act of 1993 (GPRA). The “Current Human Exposures Under Control” EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action Program’s overall mission to protect human health and the environment requires that Final Remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

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

2. Are groundwater, soil, surface water, sediments or air **media** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g, Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to end users of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale/Key Contaminants</u>
Groundwater	<u>X</u>	___	___	<u>1,1,1-trichloroethane (TCA),</u>
Air (indoors) ²	___	<u>X</u>	___	<u>1,1-dichloroethane,</u>
Surface Soil (e.g., <2 ft)	___	<u>X</u>	___	<u>1,1-dichloroethene,</u>
Surface Water	___	<u>X</u>	___	<u>tetrachloroethene, and</u>
Sediment	___	<u>X</u>	___	<u>chloroethane.</u>
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	_____
Air (outdoors)	___	<u>X</u>	___	_____

Footnotes:

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

² Recent evidence (from the Colorado Department of Public Health and Environment, and others) suggests that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures

located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

- _____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.
- X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.
- _____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s): In December 1985 and January 1986, a disposal area immediately adjacent to the north and east sides of the main building was discovered. Soil and groundwater were found to be contaminated with 1,1,1-trichloroethane (TCA) and related compounds. The area adjacent to the building was designated as a regulated hazardous waste land disposal unit and therefore became subject to closure requirements. As part of the initial closure, surficial soils exceeding the required closure standard were excavated and disposed of off site. Additional soil sampling at depth revealed varying concentrations of TCA and related compounds at depths of three to five feet. The remainder of the contaminated soil has been covered in-situ with an engineered cap. Installation of nine monitoring wells at the facility revealed similar constituents of concern in the groundwater. Groundwater contamination is being contained/remediated via a french drain installed as a groundwater stabilization measure. Figure 1 depicts the location of the regulated unit, the groundwater monitoring network, and the interceptor trench. Table 1 depicts contamination levels found in subsurface soils during the 1988 excavation. Table 2 depicts the levels of contamination found in groundwater during the semi-annual sampling events in 2000.

In addition, the final RFA Report dated September 27, 1991, identified three SWMUs and three AOCs, other than the former land disposal unit. Of these, the RFA identified one AOC as requiring further corrective action. Nine SWMUs were subsequently identified by MPM in the Post-Closure Permit Application dated March 1994 (some of which were previously identified in the RFA). Groundwater and soil investigations and remediations were completed at these areas subsequent to the final RFA. Detailed discussions of these past investigations/remediations are provided in the attached memorandum dated July 23, 1998.

Contamination remains within subsurface soils of the regulated unit. However, the unit has been capped and closed, and MPM has made notice in the property deed that the regulated unit is present, and that it must not be disturbed.

The highest levels of groundwater contamination are found to the northwest of the facility, as indicated in the Phase II Groundwater Investigation (PRC 1993). Figure

2 illustrates the plume of contamination at the time of the 1992-1993 investigation, prior to installation and operation of the interceptor trench. Groundwater currently discharges to the interceptor trench immediately downgradient of the facility, and to surface water in the vicinity of the site. MPM is currently conducting surface water monitoring pursuant to 10 CSR 25-7.264(2)(F)(4) as referenced in the facility permit. Two sampling locations are monitored semi-annually for volatile organic compounds (EPA Method 8260), pH, specific conductance, and temperature. No detectable contamination related to the facility has been found in surface water samples collected to date.

All contaminated surface soils have been removed, therefore no contamination is reasonably expected to be present in sediments associated with surface water due to overland flow. Also, MPM conducted a qualitative risk assessment in 1996, and based upon results in the report (see Table 3), the maximum TCA concentration expected to be detected in the unnamed tributary to Cedar Creek is approximately 1.7 parts per billion (ppb), using conservative assumptions. The maximum contaminant level (MCL) for TCA in drinking water is 200 ppb. For other contaminants with established MCLs, (dichloroethane and vinyl chloride) estimated concentrations in surface water are considerably below their respective MCLs (7 ppb and 2 ppb). The contaminants of concern in groundwater would not reasonably be expected to accumulate in tributary sediments due to groundwater discharge to the unnamed tributary and the volatile nature of the contaminants.

Air samples have not been collected at this site; however, the Johnson-Ettinger model (1991) has been used to estimate indoor air concentrations and assess the potential risk to workers at the MPM facility due to the contaminated groundwater plume located beneath the MPM facility. Results of the model are attached. The results indicate the cumulative excess cancer risk to the industrial workers was found to be less than 1×10^{-5} , or 1 excess cancer case per 100,000 of the population. The hazard quotient was also calculated for each of the noncarcinogenic constituents in the groundwater. The sum of these quotients is the hazard index, if the index is less than one this indicates no significant risk to the exposed population. The hazard index for the constituents at MPM was less than one, indicating no significant risk.

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

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

<u>"Contaminated" Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	<u>no</u>	<u>yes</u>	<u>no</u>	<u>yes</u>	<u>no</u>		<u>no</u>
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)				<u>yes</u>	<u>no</u>		<u>no</u>
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.
2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media - Human Receptor combination (Pathway).

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

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

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

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

Rationale and Reference(s): Groundwater monitoring is currently conducted in accordance with the RCRA Post-Closure Permit for the regulated unit. However, there are no shallow groundwater users in the vicinity, and contaminated groundwater is discharging to the interceptor trench. Previous investigation has indicated that contaminated groundwater is confined to the shallow zone (i.e., deeper groundwater

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

that might be used as a drinking water source has not been impacted.) This contaminated groundwater is conveyed by the city sewer to the City of Sedalia's Publicly Owned Treatment Works (POTW), in accordance with MPM's agreement with the City of Sedalia. The only potential for exposure exists in the event contaminated groundwater comes into contact with receptors during construction and/or sampling activities. Subsurface soils have been capped. In addition, MPM has made notice in the deed that the regulated unit is present at the facility, and that it must not be disturbed. All contaminated media are subsurface; therefore, any potential receptors would not be directly exposed unless disturbing soils or removing the lid from the pump station or sump.

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

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

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

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

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

Rationale and Reference(s): During the initial phases of closure of the former land disposal unit, 40 cubic yards of contaminated surficial soils exceeding the required closure standard were excavated in August 1988 and disposed of at the Peoria Disposal Company Landfill in Peoria, Illinois. Confirmatory soil samples revealed high levels of TCA contamination remaining in the subsurface soils. Concentrations exceeding 28,000 ppb TCA were encountered in samples taken five feet below the excavation limit. MPM determined that no further excavation could be performed without endangering the structural integrity of the adjacent building, therefore precluding the possibility of "clean closure". Therefore, the remainder of the contaminated soils were covered in-situ with an engineered cap. Approximately 10 cubic yards of contaminated soil from SWMU 4 – the Soil Pile was incorporated as surface fill material in the northern portion of the former land disposal unit to bring the area to proper grade with the adjacent building. Disturbance of the capped area is not permitted and the facility has made notice in the property deed that the regulated unit is present; therefore, any exposure to contaminated soils is highly unlikely.

Groundwater contamination remains; however, the groundwater currently discharges to the interceptor trench immediately downgradient of the facility and no measurable impacts to surface water have been identified. Surface water is sampled semi-annually, in accordance with the Missouri Hazardous Waste Management Facility Permit, and no contamination has been detected in the surface water samples to date. All contaminated surface soils at the facility have been removed, therefore no contamination is reasonably expected to be present in sediments associated with surface water due to overland flow.

Groundwater sampling is and will be routinely conducted to assess the effectiveness of the trench and drain in removing groundwater contamination and to assess the extent of the contaminant plume. During the April and October 2000 sampling events, groundwater samples exceeded the Groundwater Protection Standards (GPS) established in MPM's Hazardous Waste Management Facility Permit (see attachment). Table 2 provides MPM's analytical results for these sampling events. The GPSs for the individual constituents are: 1,1-Dichloroethene⇒ 7 µg/L; TCA⇒ 200 µg/L; and Tetrachloroethene⇒ 5 µg/L. The monitoring well network is effectively monitoring contamination levels and groundwater flow, and the operation of the interceptor trench and drain installed by MPM as part of the groundwater stabilization measure continues to effectively contain the groundwater contamination plume.

The presence of a bedrock low to the north of Boonville Road appears to have an impact on off-site movement of the shallow groundwater plume. This is in an area located on property not currently accessible to MPM. MPM is required by the permit to provide yearly documentation of the current landowner status. MPM must attempt to gain access to the property within 90 days of MPM becoming aware of any change of

ownership of the property so that MPM may monitor groundwater contamination in this area. The residence of the property has been vacant for approximately eight years, and the surrounding land is currently not utilized. MPM has made several attempts to gain access to this property for purposes of long-term monitoring of groundwater contamination. To date, these efforts have been rejected. The Missouri Attorney General's Office (AGO) has also sought access on MPM's behalf but did not get a response. Documentation supporting the AGO's and MPM's continued attempts to gain access to the adjacent property are attached.

Shallow groundwater is not used as a potable source in this area, and groundwater monitoring information available to date indicates that groundwater flow direction is to the northwest. MPM's monitoring well system currently contains five monitoring wells located in and around the plume. Of these wells, MW-13 is downgradient of the most concentrated portion of the contamination plume found during the Geoprobe investigation. Figures 3 and 4 illustrate groundwater flow for the April 2000 and October 2000 semi-annual groundwater sampling events. Contamination in the area to the northeast of the plume, which may have been present prior to the installation of the groundwater extraction system, and which may not be controlled by the extraction system is expected to be controlled by natural attenuation processes and does not discharge to surface water.

During the installation of the Phase II monitoring wells, bedrock cores were taken from the bedrock unit underlying the shallow contaminant plume. Analysis of these cores indicated that the competent bedrock underlying the interface zone acts as an aquitard. This aquitard, which is estimated to be 40 feet thick, effectively prevents the migration of any contamination into lower bedrock units which may be potential water supply sources.

MPM conducted a qualitative risk assessment in 1996, and based upon the results, the maximum TCA concentration expected to be detected in the unnamed tributary to Cedar Creek, is approximately 1.7 ppb, using conservative assumptions. The MCL for TCA in drinking water is 200 ppb. For other contaminants with established MCLs, (dichloroethane and vinyl chloride) estimated concentrations in surface water are considerably below their respective MCLs (7ppb and 2 ppb). The contaminants of concern in groundwater would not reasonably be expected to accumulate in tributary sediments due to groundwater discharge to the unnamed tributary and the volatile nature of the contaminants.

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

- If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
- If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.
- If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

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

- YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Missouri Pressed Metals facility, EPA ID #MOD073029936, located at 1200 East Boonville Road under current and reasonably expected conditions. This determination will be re-evaluated when the agency/state becomes aware of significant changes at the facility.
- NO - "Current Human Exposures" are NOT "Under Control."
- IN - More information is needed to make a determination.

Completed by: (Signature) Original signed by Natalie Roark Date August 13, 2001
(Print) Natalie Roark
(Title) Environmental Engineer

Supervisor: (Signature) Original signed by Richard Nussbaum Date August 13, 2001
(Print) Richard Nussbaum, P.E., R.G.
(Title) Unit Chief, Corrective Action Unit
(EPA Region or State) State

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Locations where References may be found: MPM facility files located at:

Missouri Department of Natural Resources

Hazardous Waste Program

1738 East Elm Street

Jefferson City, Missouri 65102

and/or

U.S. Environmental Protection Agency, Region VII

RCRA Corrective Action and Permits Branch

Air, RCRA, and Toxics Division

901 N. 5th Street

Kansas City, KS 66101

Contact telephone and e-mail numbers

(Name): Natalie Roark

(Phone #): (573) 751-3553

(E-mail): nrroarn@mail.dnr.state.mo.us

Final Note: The Human Exposures EI is a Qualitative Screening of exposures and the determinations within this document should not be used as the sole basis for restricting the scope of more detailed (e.g., site-specific) assessments of risk.

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ATTACHMENT

July 23, 1998 Memo to MDNR File

ATTACHMENT

Johnson-Ettinger Model

FIGURES

TABLES

ATTACHMENT

Site Access Documentation