

9/17/03VB

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control**

Facility Name: Great Lakes Chemical Company(formerly FMC Corporation)
Facility Address: Nitro, WV
Facility EPA ID #: WVD 00 500 5087

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?

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

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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) 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	X			See # 1, below
Air (indoors) ²		X		See # 4, below
Surface Soil (e.g., <2 ft)	X			See # 2, below
Surface Water		X		See # 3, below
Sediment		X		See # 3, below
Subsurf. Soil (e.g., >2 ft)	X			See # 3, below
Air (outdoors)		X		See # 4, below

_____ 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.

YE 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.

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 Dept. of Public Health and Environment, and others) suggest 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.

RATIONALE:

- #1.-** Based on the Phase I Draft RFI results of April and May 2003, the primary detected site-related constituents are carbon bisulfide, methylphenol, benzene, carbon tetrachloride, chloroform and arsenic. The groundwater impacts are limited to localized areas in the low permeability silt/clay zone. The potential off-site contaminant migration is indicated from the monitoring wells along the river bank with concentrations exceeding MCLs are MW-11S - carbon tetrachloride (17,000 ppb), MW-12S - carbon tetrachloride (1,900), chloroform (1,200), methylene chloride (58), vanadium (20), and MW- 14S - arsenic (23). At these points, the contaminated groundwater will discharge into Kanawha River. Through dilution, the impact to human health would be minimal. WV has exempted the Kanawha, or de-classified it, as a drinking water source, so there are no intakes on the Kanawha. The only human exposure would then be recreational, although no such activity occurring at the facility. The contaminants and concentrations are insignificant for that exposure route.
- #2.** Based on the Phase I Draft RFI results of April and May 2003, site-related contaminants are present in surface and subsurface soil above the EPA risk-based screening levels.
- #3.** There are no discrete surface water conveyances at the facility. During operations, all surface water runoff from process areas was collected and treated via the facility's on-site wastewater treatment plant. The Kanawha River is immediately adjacent to the facility. Based on the collection and treatment of on-site surface water, and the nature of the many chemicals used at the facility (chemicals that violently react with moisture), surface water and sediments in the Kanawha River are not anticipated to be impacted by surface water run-off from facility operations. Although groundwater wells in the close proximity to the Kanawha River showed some constituents in excess of ten times the groundwater quality standards, surface water is not anticipated to be affected due to the low permeability of the silt and clay water-bearing zone where these contaminants were detected (and the corresponding low rates of groundwater discharge to the river from this zone), and the significant dilutional effect of the river.
- #4.** There are no indoor air media as the facility has stopped production and the above-ground structures are presently (September 2003) being demolished . Ambient air monitoring conducted during the Phase I Draft RFI identified acceptable air quality conditions through out the facility.

REFERENCES: Phase I Draft RFI results, (FMC 7/24/2003 Presentation, EPA Philadelphia, PA)

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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)

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	NO	NO	NO	YES			NO
Air (indoors)							
Soil (surface, e.g., <2 ft)	NO	NO	NO	NO	NO	NO	NO
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)				YES			NO
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

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

Rationale:

General Note— the facility is no longer in operation. Demolition activities consisting of removal of all above-ground structures while leaving in place foundations and pavement, will be completed by September 2003. The facility is surrounded by a chain-link fence on all sides, which will remain following demolition activities.

Groundwater: There are no known groundwater users in the vicinity of the facility. Public municipal water using the Elk river as a source is supplied to the residents and industry in the area. All groundwater beneath the facility flows to the Kanawha River, which is located immediately west of the downgradient property boundary and forms a regional hydraulic discharge boundary. Therefore, there is no possibility of potential groundwater users downgradient of the facility. The zoning for the facility is currently industrial and is expected to remain industrial. The shallow water-bearing zone (silt and Clay) would not produce sufficient quantities of groundwater for residential or residential use, but is shallow enough in some locations (within five to ten feet of the ground surface) to be contacted by construction workers during excavation activities. Deeper groundwater, in the sand unit that overlies bedrock, is not affected by site-related constituents.

Surface and subsurface Soil: There are no residents on or on the immediate vicinity of the facility. Approximately 85 percent of the facility is covered by asphalt or concrete cover material. The facility is fenced and gated and is no longer in operation. Also, the current zoning for the facility and the areas surrounding the facility is industrial. These factors eliminate the potential for exposure to surface soil and subsurface soil by residents, workers, daycare, trespassers, recreational users and food. However, it is possible that a construction worker could be exposed to surface soil and/or subsurface soil during current or ongoing excavation or construction activities, or during environmental investigations or remediation.

Reference(s): Phase I Draft RFI, May 2003

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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 can not 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

Rationale and Reference(s):

Groundwater: Under current conditions, the shallow groundwater beneath the facility would be contacted by construction workers only during excavation activities associated with the facility demolition or environmental remediation. Under these activities, the frequency and duration of contact would be low and the adherence to the Health and Safety Plan requirements and its requirement for personal protective equipment should negate exposure pathway.

Soil: Samples of exposed surface soil samples from the Phase I Draft RFI, 5/2003, show two samples with concentrations of contaminants exceeding the industrial soil quality criteria for direct contact. While some subsurface soil samples exceed soil quality criteria, the duration of construction workers potential exposure to subsurface soil would be a much shorter duration than the default values in the risk calculation considering the non-residential soil quality standards (i.e. industrial worker protective).

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.

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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):

