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:	Henkel Corporation
Facility Address:	322 West Main Street, Morenci, MI
Facility EPA ID #:	MID 058 723 867

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 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).

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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Vinyl Chloride, TCE
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)	X			Lead
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2ft)		X		
Air (outdoors)		X		

____ 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):
Groundwater has been analyzed in all monitoring wells in 1991 and 2002. In 1991, the concentration of trichloroethene exceeded the U.S. EPA's Maximum Contaminant Level (MCL) for drinking water in one monitoring well (MW3).

In 2002, the following chemicals were detected in Monitoring Well 3 (MW3):
1,1 dichloroethane, 1,1 dichloroethene, bromodichloromethane, chloroform, cis-1,2 dichloroethene, trans 1,2 dichlroethene, trichloroethene, trichlorofluoromethane, 1,1,1 trichloroethane and vinyl chloride.

The maximum concentration of vinyl chloride and TCE were found to be 30 ppb and 14 ppb respectively. These levels exceed the MCL and MDEQ residential and industrial drinking water criteria. This information can most recently be located in the US EPA Supplemental Risk Analysis for Henkel Surface Technologies dated April 22, 2003.

Historical groundwater analysis from 1991 to the present indicates decreasing concentrations of all contaminants, with the exception of vinyl chloride, which is the final degradation product of

[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.

trichloroethene. As attenuation (biodegradation and natural dechlorination) occurs in the groundwater system, it is expected that vinyl chloride will decrease as well. This will be verified by Henkel's groundwater monitoring.

Groundwater discharges into Bean Creek, as determined by the geology and groundwater flow regime. which is the western border of the facility. Bean Creek flows from south to north. The flow is significant with a mean of 22 cubic feet/sec (cfs). This flow is based on 22 years of U.S. Geological Survey gauging data at Powers, OH, about 15 miles upstream.

In September of 2002, soils inside and outside the fence line of the Henkel facility were sampled and analyzed for volatile and semi volatile organic compounds, poly chlorinated biphenyls, and metals. The surface soil at Waste Storage area number 6 had a maximum lead concentration of 56,000 mg/Kg and far exceeded the MDEQ industrial soil screening criteria. No other chemical contaminants were found at levels posing a human health risk for industrial or commercial use using Michigan Department of Environmental Quality (MDEQ) Part 201 guidance. A Human Health risk assessment conducted by Techlaw Inc. on behalf of the US EPA verified this result in early 2003.

In July of 2004 sediments from Bean Creek, which borders the site on the east, were sampled for Metals, Volatile Organic Compounds, Semi-Volatile Organic Compounds and Poly-Chlorinated Biphenyl compounds. Analytical results indicate that none of these contaminants were found in the Bean Creek sediment sampling locations in excess of MDEQ Part 201 residential soil screening criteria which is conservative when compared to sediment screening criteria

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	N	N	N	Y	N	N	N
~~Air (indoors)~~							
Soil (surface, e.g., <2 ft)	N	Y	N	Y	N	N	N
~~Surface Water~~							
~~Sediment~~							
~~Soil (subsurface e.g., >2 ft)~~							
~~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

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

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):

Lead concentration in Waste storage area 6 has lead contamination that greatly exceeds MDEQ part 201 industrial screening criteria and thus provides a potential for exposure to construction worker, routine worker and trespasser. Cleanup of Waste Storage area will be performed by Henkel under a pending agreed order.

Although vinyl chloride in ground water exceeds the residential and commercial drinking water criteria, restrictions are in place to prevent the use of groundwater for potable purposes. However, groundwater exists at shallow levels, 10 to 25 feet below ground surface, the construction worker could come into contact with groundwater during excavation activities.

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."

[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.

____ 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):

Currently, the Henkel Morenci facility is not in operation and surrounded by a fence and locked gate, limiting access to authorized personnel only. Thus the exposure to trespassers and routine workers due to surface soil contamination is negligible. If any worker or construction access is required, appropriate personal protective equipment will be used and personnel will have the required safety training to work in potentially contaminated areas. The concentration of trichloroethylene (14 ppb) and vinyl chloride (30 ppb) detected in ground water is well below the MDEQ ground water contact criteria which is 37000 ppb and 570 ppb respectively. Thus the cumulative risk of construction workers due to inhalation, ingestion and dermal contact from ground water is expected to be not significant and falling within the risk range of 1e-04 to 1e-06.

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

NOT APPLICABLE

_____ 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 RCRIS 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):

X 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 **Henkel Corporation** facility, EPA ID # **MID 058 723 867**, located at **322 West Main Street, Morenci, MI**, 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) _____ Date _____

(print) Brian P. Freeman

(title) Sr. Chemist and Project Manager

Supervisor (signature) _____ Date _____

(print) George Hamper

(title) Chief, Corrective Action Section, ECAB

(EPA Region or State) 5

Locations where References may be found:
Region 5 records center (7th floor).

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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.