

US EPA ARCHIVE DOCUMENT

## 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: Ashland, Inc.  
Facility Address: 1800 Glenrose Avenue, Lansing, Michigan  
Facility EPA ID #: MID 047 173 653

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).

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

Page 2

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> 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	<u>X</u>	___	___	Volatile organic compounds (VOCs)
Air (indoors) <sup>2</sup>	<u>X</u>	___	___	No buildings exist on the property except for a remediation shed. The groundwater plume extends into the residential area
Surface Soil (e.g., <2 ft)	___	<u>X</u>	___	VOCs fall within acceptable risk range
Surface Water	___	<u>X</u>	___	In 1987 low levels of VOCs were found up- and downgradient of the property in the surface water samples from the Grand River
Sediment	___	<u>X</u>	___	In 1987 low levels of VOCs were found up- and downgradient of the property in sediment samples from the Grand River in 1987
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	VOCs exceed soil to groundwater migration levels.
Air (outdoors)	<u>X</u>	___	___	Groundwater treatment through the air stripper emissions may contribute contamination to outdoor air

\_\_\_ 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):** The site was used for a chemical distribution operation by Ashland from 1968 to 1984. In 1985 the underground storage tanks, the above ground storage tanks, and associated piping were decontaminated and removed from the Site. The process buildings and surface structures were demolished and removed. A groundwater treatment system building remains on-site.

**Groundwater:** Concentrations of volatile organic compounds (VOCs) in groundwater are above United States Environmental Protection Agency (USEPA) Maximum Contaminant Levels (MCLs) and/or Michigan Department of Environmental Quality (MDEQ) residential drinking water criteria (RDWC). The on-site VOCs found at concentrations above the MCLs and/or RDWC in groundwater were vinyl chloride (VC) 2,000 micro grams per liter (µg/L); chloroethane 20,000µg/L, 1,1-dichloroethene <10µg/L, cis-1,2-dichloroethene (cis-1,2-DCE) 40,000 µg/L, trichloroethene (TCE) <200 µg/L, 1,1,1-trichloroethane 3,500 µg/L, benzene 16 µg/L, toluene 23,000 µg/L, ethylbenzene 1,900 µg/L, and xylenes 7,000 µg/L (Ashland, 1994, Fluor Daniel, 1997 and URS, 2003).

Off-site groundwater concentrations are significantly lower than on-site groundwater concentrations, the depth to groundwater increases and the amount of fine-grained glacial overburden increases (URS 2003). The off-site VOCs found at concentrations above the MCLs and/or RDWC in groundwater were VC 130µg/L, cis-1,2-DCE 270µg/L, TCE 64µg/L, and benzene 22µg/L, (Ashland, 1994, Fluor Daniel, 1997 and URS, 2003). Comparing the off-site groundwater concentrations (URS 2003) to Michigan Part 201 Generic Cleanup Criteria and Screening Levels (Residential & Commercial Groundwater Volatilization to Indoor Air Inhalation Criteria), levels are typically orders of magnitude below the criteria. Volatilization of VOCs from groundwater to indoor air is not expected.

*Surface Soil:* A soil risk evaluation was conducted in which soil sampling results from 1985 and 1986, 1987, 1990, and 1999 were compared to USEPA risk-based Preliminary Remediation Goals (PRGs) for industrial direct contact exposures (ESC, 2001). For surface soil, the cumulative potential carcinogenic risk was  $3 \times 10^{-6}$  and potential non cancer hazard was 0.2. The only individual analyte contributing to a total site risk above  $1\text{E-}06$  in surface soil was tetrachloroethylene (risk =  $3 \times 10^{-6}$ ). The site risks and hazards fall within EPA's range of acceptable risks and hazards.

*Subsurface Soil:* A soil risk evaluation was conducted in which soil sampling results from 1985 and 1986, 1987, 1990, and 1999 were compared to USEPA risk-based Preliminary Remediation Goals (PRGs) for industrial direct contact exposures. Analytes contributing to a risk above a  $1 \times 10^{-6}$  risk in subsurface soils were benzene (risk =  $8 \times 10^{-6}$ ) and 1,1,2,2-tetrachloroethane ( $1 \times 10^{-5}$ ). The site risks and hazards fall within EPA's range of acceptable risks and hazards.

Footnotes:

- <sup>1</sup> "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).
- <sup>2</sup> Recent evidence (from the Colorado Dept. 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.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 3

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)

<b><u>“Contaminated” Media</u></b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>
Air (indoors)	Yes	Yes	No	No	No	No	No
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>
Air (outdoors)	Yes	Yes	Yes	No	No	No	No

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.

- X   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).
- 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:* Groundwater is not used for potable purposes on-site. Environmental workers utilize personal protective gear (i.e., gloves, protective coverings, etc.) when working with the groundwater recovery and treatment system equipment and/or monitoring wells. Several active Lansing Board of Water and Light (LBWL) production wells are within a one-mile radius of the property. LBWL utilizes and provides treated groundwater for potable purposes. Publicly reported municipal water testing results (provided annually by LBWL) have not shown detections of chlorinated organics above MCLs. The groundwater from the production wells are blended and treated prior to distribution. In addition, a well survey conducted as part of the RFI (TM Gates 1990), did not identify private wells downgradient of the property. Although drinking water pathway can be excluded for groundwater contamination, indoor air volatilization of volatile contaminants in the groundwater cannot be excluded. Similar exposure potential for outdoor air contamination exists for air stripper emissions through groundwater pump and treatment system.

*Air (indoors):* Indoor air volatilization is a complete pathway to the residents close to the Facility. Ambient air may be contaminated due to air stripper emissions.

*Subsurface Soil:* No near-term construction is planned on-site. Access to the property is limited by a locked fence and barbed wire. Workers have the potential to come in contact with subsurface soil. Environmental workers utilize personal protective equipment (i.e., gloves, protective coverings, etc.) to prevent exposure. A soil risk evaluation was conducted in which soil sampling results from 1985 and 1986, 1987, 1990, and 1999 were compared to USEPA risk-based Preliminary Remediation Goals (PRGs) for industrial direct contact exposures. Analytes contributing to a risk above a  $1 \times 10^{-6}$  risk in subsurface soils were benzene (risk =  $8 \times 10^{-6}$ ) and 1,1,2,2-tetrachloroethane ( $1 \times 10^{-5}$ ). The site risks and hazards fall within EPA's range of acceptable risks and hazards.

*Air (outdoors):* Outdoor air is a completed pathway dispersion modeling studies indicate that the ambient air contamination from the air stripper emission is negligible and falling within the acceptable regulatory limits (URS Technical Memorandum, April 7, 2005).

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

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

Page 4

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be “**significant**”<sup>4</sup> (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:* Groundwater is not used for potable purposes on-site. Workers utilize personal protective equipment (i.e., gloves, protective coverings, etc.) to prevent exposure when working with the groundwater recovery and treatment system equipment and/or monitoring wells. Several active Lansing Board of Water and Light (LBWL) production wells are within a one-mile radius of the property. LBWL utilizes and provides treated groundwater for potable purposes. Publicly reported municipal water testing results (provided annually by LBWL) have not shown detections of chlorinated organics above MCLs. The groundwater from the production wells are blended and treated prior to distribution. In addition, a well survey conducted as part of the RFI (TM Gates 1990) did not identify private wells downgradient of the property. It is on this basis that groundwater is not considered a completed pathway.

*Air (indoor):* The indoor air volatilization associated with groundwater contaminants is not concern with respect to onsite workers or offsite residents. Johnson and Ettinger modeling results indicate that the indoor air concentration of vinyl chloride, benzene and other contaminants resulting in acceptable individual excess cancer risk of 1 in 100,000 and a non cancer hazard quotient of 1 (see attached Johnson and Ettinger modeling).

*Subsurface Soil:* The property has been vacant since 1985. Access to the property is limited by a locked fence and barbed wire. Workers access the property on an intermittent basis, and follow health and safety practices and wear appropriate personal protective equipment to prevent potential exposure. No near term construction is planned at the site. A groundwater recovery system is in place as an interim measure to intercept soil to groundwater migration. No underground utilities are present in this area that would require future maintenance. Subsurface soil work is conducted in accordance with approved health and safety plans for site work. Soil vapor extraction pilot studies implemented in August 2004 will likely lead to further reduction in subsurface contaminant concentrations.

*Air (outdoor):* Dispersion modeling studies indicate that the ambient air contamination from the air stripper emission is negligible and falling with in the acceptable regulatory limits. It is on this basis that outdoor air is considered a completed pathway.

<sup>4</sup> 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.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 5

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):

Skip to 6



**US EPA ARCHIVE DOCUMENT**

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):

IN - More information is needed to make a determination.

Supervisor \_\_\_\_\_ Date \_\_\_\_\_  
George Hamper  
Chief  
U.S. EPA Region 5

U.S. EPA File Room  
77 W. Jackson Blvd.  
Chicago, IL 60604

Ashland. 1994. RCRA Facility Investigation Report, Revision 1. Ashland Chemical Inc., Industrial Chemical and Solvents Division, Glenrose Avenue, Lansing, Michigan. January 1994.

ESC. 2001. Technical Memorandum: Risk Evaluation for Soil. Ashland Inc. – Glenrose Avenue Site, Lansing, Michigan. July 2001.

Fluor Daniel GTI. 1997. Supplemental RFI Report. Ashland Chemical Company, 1800 Glenrose Avenue, Ingham County, Lansing, Michigan. November 1997.

TM Gates. 1990. RCRA Facility Investigation (RFI) Report. Ashland Chemical, Inc. Industrial Chemical and Solvents Facility, Glenrose Avenue, Lansing, Michigan. July 1990.

URS. 2003. Draft Corrective Measures Study (CMS)-Glenrose Avenue, Lansing, Michigan. September 2003.

URS 2005. URS Technical Memorandum Air Modeling, , Glenrose Avenue, Lansing, Michigan, April 7, 2005

URS 2005. URS Technical Memorandum Johnson and Ettinger Modeling, Glenrose Avenue, Lansing, Michigan, April 21, 2005.

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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.**



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