

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: Dana Corporation, Boston Weatherhead Division
Facility Address: 5278 U.S. 24 East, Antwerp, OH
Facility EPA ID #: OHD 005 039 730

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?

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			Benzene, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,1,2-TCA, TCE, and vinyl chloride exceed MCLs.
Air (indoors) ²	X			TCE exceeds residential indoor air screening criteria.
Surface Soil (e.g., <2 ft)	X			cis-1,2-DCE, TCE, vinyl chloride, and PAHs exceed PRGs
Subsrf. Soil (e.g., >2 ft)	X			cis-1,2-DCE, TCE, and vinyl chloride exceed PRGs.
Sediment	X			cis-1,2-DCE, TCE, and vinyl chloride exceed PRGs.
Surface Water		X		All concentrations below Ohio Water Quality Criteria.
Air (outdoors)		X		Ohio EPA Air Permits

_____ 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.

References:

Documentation of Current Conditions (Volumes I & II). November 2003. RMT, Inc.
Sediment and Surface Water Results (Letter Report). April 27, 2004. RMT, Inc.
Surface Water/Sediment Workplan for the Maumee Cemetery Ditch. September 2004. RMT, Inc.
RCRA Facility Investigation Report (Volumes I & II). August 2005. RMT, Inc.
RCRA CA725 Environmental Indicator Determination. E-mail, September 6, 2005. RMT, Inc.

Rationale: The Dana facility comprise 27 acres on the eastern edge of the town of Antwerp. U.S. Route 24, a cemetery, residences, and the Maumee River are located to the north and west. The facility is bounded on

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.

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the east and west by industrial property. A farm field is located to the south. Auto parts manufacturing at the facility ceased in April 2003. The plant has closed and is unoccupied except for some storage activities at the main loading dock area. One full-time Dana employee remains at the plant as a caretaker.

Groundwater - A groundwater contaminant plume consisting of TCE and its degradation products is present in the surface lacustrine clay unit in the southern and eastern portion of the facility. It extends downward through a clay till, into the deeper outwash and bedrock units beneath the facility but its areal extent in the deep aquifers is much less than that found in the surface lacustrine clay unit. In the bedrock unit, mainly vinyl chloride is found in a small area at the former TCE Storage Area at the southern portion of the facility. The plume barely extends off-site in the bedrock at the southern facility boundary (farm field). The closest residential wells downgradient and using the bedrock aquifer were sampled; no VOCs were detected. Groundwater contaminants exceeding maximum contaminant levels (MCLs) for drinking water are mainly *cis*-1,2-DCE, TCE, and vinyl chloride. Maximum contaminant concentrations detected in the various units underlying the facility and corresponding MCLs (exceedances in **bold**) are:

Groundwater Contaminant	Maximum Concentration ($\mu\text{g/l}$)	MCL ($\mu\text{g/l}$)
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Lacustrine/Till Unit		
Benzene	1,200	5
1,1-dichloroethene	437	7
<i>cis</i> -1,2-dichloroethene	370,000	70
<i>trans</i> -1,2-dichloroethene	1,720	100
1,1,2-trichloroethane	50	5
Trichloroethene	470,000	5
Vinyl chloride	14,500	2

Outwash Unit		
Benzene	<1	5
1,1-dichloroethene	<1	7
<i>cis</i> -1,2-dichloroethene	12	70
<i>trans</i> -1,2-dichloroethene	<1	100
1,1,2-trichloroethane	<1	5
Trichloroethene	29	5
Vinyl chloride	1	2

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Groundwater Contaminant	Maximum Concentration ($\mu\text{g/l}$)	MCL ($\mu\text{g/l}$)
Bedrock Unit		
Benzene	<1	5
1,1-dichloroethene	<1	7
<i>cis</i> -1,2-dichloroethene	110	70
<i>trans</i> -1,2-dichloroethene	0.33	100
1,1,2-trichloroethane	<1	5
Trichloroethene	1.5	5
Vinyl chloride	170	2

Air (indoors) - The potential for vapor intrusion into on-site industrial buildings was evaluated due to the presence of VOCs in soil and shallow groundwater in the surface lacustrine clay unit beneath the main manufacturing plant. Indoor air was sampled in the manufacturing plant at seven areas. SUMMA canisters were placed approximately 5-feet above the plant floor. One SUMMA canister was placed in a sub-basement to assess the worst-case exposure scenario. *Cis*-1,2-DCE, TCE, and vinyl chloride were detected at respective maximum concentrations of 21, 45, and 4 $\mu\text{g}/\text{m}^3$.

Air (outdoors) - The vacuum-enhanced pumping (VEP) system installed as an interim measure pursuant to the corrective action Consent Order uses an air stripper to treat VOCs removed from groundwater and extracted subsurface air. The VOCs emitted to ambient air have an Ohio EPA permit.

Surface and Subsurface Soil - Soil data was compared to Soil Screening Levels (SSLs) and Preliminary Remediation Goals (PRGs) for Industrial Soils. Of the 20 SWMUs or Areas of Concern investigated on-site, six areas had exceedances of SSLs and/or PRGs: 1) TCE and vinyl chloride in surface and subsurface soils at the Boiler Blowdown Sump (SWMU 8); 2) *cis*-1,2-DCE, TCE, and vinyl chloride in surface and subsurface soils at the TCE Storage Area and Clarifier; 3) *cis*-1,2-DCE, TCE, and vinyl chloride in subsurface soils at the Oil Storage Tank Containment Area (AOC A); 4) TCE in surface and subsurface soils at the former TCE Degreasers; 5) *cis*-1,2-DCE, and TCE in subsurface soils at the Empty Drum Storage Area; and 6) PAHs in surface soils at the 300-gallon Kerosene Aboveground Storage Tank.

Surface Water and Sediment - The facility stormwater discharges to the Cemetery Ditch located immediately west of the facility. The Cemetery Ditch discharges to the Maumee River. Contaminant concentrations in surface water in the Cemetery Ditch were compared to Ohio Water Quality Criteria (WQC) for human health (non-drinking). None of the contaminants exceeded Ohio WQC. For sediment, applicable PRGs and ecological screening criteria were exceeded for *cis*-1,2-DCE, TCE and/or vinyl chloride at sample locations within 500-feet of the discharge pipe.

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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)

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

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.

References:

Sediment and Surface Water Results (Letter Report). April 27, 2004. RMT, Inc.
Surface Water/Sediment Workplan for the Maumee Cemetery Ditch. September 2004. RMT, Inc.
Cemetery Ditch Removal Action Technical Memorandum. August 15, 2005. RMT, Inc.

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

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RCRA Facility Investigation Report (Volumes I & II). August 2005. RMT, Inc.
RCRA CA725 Environmental Indicator Determination. E-mail, September 6, 2005. RMT, Inc.

Rationale: Groundwater - Potential on-site exposure to contaminated groundwater in the surface lacustrine clay unit can occur from direct contact during excavation activities and from management of the VEP system installed as an interim measure to remove VOCs from the lacustrine clay unit.

Potential off-site exposure to contaminated groundwater in the bedrock aquifer is not possible under current conditions. A small vinyl chloride plume extends only slightly off-site beneath a farm field and is being monitored. The closest residential wells were sampled and were free of site-related VOC contaminants. Two on-site industrial wells used formerly for manufacturing purposes have been plugged and abandoned. The facility currently relies on city water for on-site use.

Indoor air: Dana Corporation has ceased manufacturing at the facility. Only a few workers are presently active in an area located at the main loading dock at the northwest corner of the plant. Although the contamination has not been identified beneath this portion of the plant, the exposure to the contaminated indoor air is potentially a complete pathway for the workers inside the plant.

Surface and subsurface soil - The direct exposure of workers to contaminated surface soil exceeding PRGs is not reasonably expected under current conditions. Impacted areas are either located directly beneath the plant under thick concrete floors or are located outdoors to the south (former TCE Storage Area) and east (former Clarifier) in an area where activities are restricted to personnel involved with remediation activities being performed under a site Health & Safety Plan. In addition, asphalt pavement is being laid at the former TCE Storage Area where PRGs in surface soil are exceeded. The purpose of the pavement is to further limit any direct contact and to prevent surface infiltration. Reduced surface infiltration is desirable to increase the efficiency of the on-site interim remediation VEP system. Pavement activities are scheduled to begin on September 26, 2005, and be completed by October 21.

The entire facility is fenced, gated, and locked to prevent trespassing. Manufacturing operations have ceased at the facility. Under current conditions, only a few workers are active on-site in a leased portion of the building located at the northwest corner of the plant (main loading dock). They do not perform any work outside at the southern and eastern contaminated area.

Exposures to construction workers during subsurface activities beneath the plant and at the southern and eastern portion of the facility are possible, if such activities were to occur.

Sediment - The on-site storm sewer system and the upper 500-feet of the Cemetery Ditch which receives storm runoff from the facility were found to have concentrations of cis-1,2-DCE, TCE, and vinyl chloride in sediment which exceeded applicable PRGs and ecological screening criteria. Because of its minimal base flow and shallow depth, the ditch does not support a fish population. On-site construction workers could be potentially exposed to contaminants in the storm sewer system. Off-site workers, trespassers, and visitors at the cemetery could be potentially exposed to site-related contaminants present in the Cemetery Ditch.

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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)?

_____ 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.”

X 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

References:

Cemetery Ditch Removal Action Technical Memorandum. August 15, 2005. RMT, Inc.
RCRA Facility Investigation Report (Volumes I & II). August 2005. RMT, Inc.
RCRA CA725 Environmental Indicator Determination. E-mail, September 6, 2005. RMT, Inc.
Summary of Confirmation Sampling Analytical Data. E-mail, September 13, 2005. RMT, Inc.

Rationale: Groundwater - Construction workers at the facility may be exposed to contaminated groundwater in the surface lacustrine clay unit during excavation activities. Conservative screening criteria for cis-1,2-DCE, TCE, and vinyl chloride are exceeded. However, Dana has ceased manufacturing operations at the facility. Any construction activities are performed using the site Health & Safety Plan prepared under the corrective action Consent Order. Implementation of the plan eliminates or minimizes exposures to site-related contaminants.

Potential on-site exposure of contaminated groundwater is also possible at the VEP system. However the system is designed to keep the groundwater within pipes and tanks, and only clean water is discharged. There is a written Health & Safety Plan that eliminates or minimizes exposure during operation and maintenance activities.

Subsurface soil - Potential exposures to subsurface soil contamination under current conditions would not

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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be expected to pose a significant risk to construction workers. The plant has ceased manufacturing operations and has been decommissioned pursuant to Ohio EPA regulations. The only current construction activities at the site are associated with remediation. A site Health & Safety Plan that addresses and minimizes exposures to VOCs has been developed by RMT (Dana's Contractor) for conducting any remediation activities at the facility.

Indoor air: The maximum indoor air concentration of cis-1,2-DCE (21 ug/m³) and vinyl chloride (4 ug/m³) did not exceed the conservative residential screening criteria of 35 ug/m³ and 5.6 ug/m³ respectively. However, TCE at a maximum concentration of 45 ug/m³ exceeded the residential screening criteria. Therefore, a site specific risk characterization of indoor air pathway for the workers was conducted. A unit risk inhalation factor (URF) was calculated for workers exposed to 8 hrs a day at the northwest corner of the plant. Using a cancer slope factor of 6.0E-03 (mg/kg-d)⁻¹ for TCE, the URF was calculated to be 0.85E-06 ug/m³. With a conservative assumption of workers exposed at an exposure frequency of 245 days for 30 years, the excess cancer risk due to indoor air exposure to TCE was calculated to be 1.1E-05. Also the cumulative risk and noncancer hazard due to the exposure to these volatile contaminants was 1.3E-5 and one respectively. Therefore, worker exposure to indoor air concentration is considered insignificant.

Sediment - Investigations in 2004 of the on-site storm sewer system and the Cemetery Ditch which receives facility stormwater runoff found concentrations of cis-1,2-DCE, TCE, and vinyl chloride which exceed applicable PRGs and ecological screening criteria. In response to this release, contaminated sediment (approximately 7.5 cubic yards) was removed from the storm sewer lines and catch basins. Additionally, approximately 600 tons of contaminated sediment and underlying native soil from the Cemetery Ditch were removed in August 2005. Confirmation sampling shows that the cleanup goals protective of human health and the environment (654 µg/kg for cis-1,2-DCE, 112 µg/kg, for TCE, and 202 µg/kg for vinyl chloride) were achieved at most locations. However, five confirmation sample locations still exceed cleanup goals for cis-1,2-DCE and TCE.

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):

Sediment - The maximum residual contamination of cis-1,2-DCE at 8.9 ppm and vinyl chloride at 0.1 ppm did not exceed the conservation Region 9 PRG screening criteria of 43 ppm and 0.75 ppm respectively. However TCE at a maximum concentration of 170 ppm exceeds the residential and industrial screening criteria. Therefore, a site specific risk assessment was conducted for the cemetery visitor and the workmen

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exposure to ambient air volatilization of TCE from the contaminated sediment. Other exposure pathways such as dermal contact or ingestion of the contaminated sediment is potentially incomplete due to the depth at which the contamination is found. The excess cancer risk at an estimated exposure frequency of 52 days per year for a cemetery visitor using a cancer slope factor of $6E-03$ (mg/kg-d)⁻¹ for TCE was calculated to be $6.6E-08$. For a caretaker in the cemetery using a conservative assumption of 245 days of exposure a year for 30 years, the excess cumulative risk was calculated to be $1.22E-06$. These exposures are within acceptable limits. In addition, Dana has applied for a permit to fill and re-contour the excavated ditch. When the permit is obtained, fill will be laid down to provide access to the five remaining sample locations that still exceed cleanup goals. Further excavation and confirmation sampling will be performed to meet cleanup goals. This is expected to occur in late-October or November 2005.

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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):

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 Dana Corporation facility, EPA ID No. OHD 005 039 730, located at Antwerp, Ohio 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) Kenneth S. Bardo Date Sept. 29, 2005
(print) Kenneth S. Bardo
(title) Environmental Scientist

Supervisor (signature) George Hamper Date 9-29-05
(print) George Hamper
(title) Section Chief
(EPA Region or State) EPA Region 5

B. Sundar
9/29/05

Locations where References may be found:

RCRA 7th Floor File Room, EPA Region 5 Office, 77 W. Jackson Blvd., Chicago, IL

Contact telephone and e-mail numbers

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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.