DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	Former Teledyne Monarch Plant 1
Facility Address:	10 Lincoln Park, Hartville, Ohio
Facility EPA ID #:	OHD 068 901 610

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

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. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

X If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Key groundwater contaminants include: 1,1,1-trichloroethene 240,000 micro grams per liter (µg/L), 1,1-dichloroethane 15,000 µg/L, tetrachloroethene 13,000 µg/L, cis-1,2-dichlorethene 220,000 µg/L, acetone 632,000ug/l and vinyl chloride 4500J µg/L (J = estimated value) (Unsaturated Zone and Perched Unit Aquifer Remediation Pre-Design Study, MACTECH 2004). Sampling of offsite residential wells was undertaken vinyl chloride was deleted at 3.2 µg/L (Final Interim Report, IT, 1993).

Key subsurface soil contaminants include: 1,1,1-trichloroethane 45,000 micrograms per kilogram (µg/kg), 1,1-dichloroethane 57,000 µg/kg, acetone 3,600 µg/kg, ethylbenzene 3,300 µg/kg, xylenes (total) 27,000 µg/kg, tetrachloroethene 130,000 µg/kg, trichloroethene 46,000 µg/kg, cis-1,2-dichchloroethene 340,000 µg/kg, vinyl chloride 13,000 µg/kg, and methylene chloride 18,000 µg/kg (Unsaturated Zone and Perched Unit Aquifer Remediation Pre-Design Study, MACTECH 2004).

[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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Contaminated groundwater is within the confines of the facility's industrial complex, which is zoned for industrial use. The groundwater does not intersect any surface water within the perimeter of the plume. The depth to groundwater is five feet (Unsaturated Zone and Perched Unit Aquifer Remediation Pre-Design Study MACTECH 2004). The site is not used for habitation, has no full time residents, and does not house any recreational, healthcare, day-care, or playground facilities. No recreational areas are located within the facilities boundary, and no growth of crops, grazing of livestock, or harvesting of fish occurs on the property. There are no human exposures to contaminated groundwater on- or off-site. Verification that the Human Exposure and Migration of Contaminated Groundwater Environmental Indicators associated with the presence of volatile organic compounds (VOCs) in site groundwater are under control is based on the following factors:

Although concentrations of groundwater constituents in site monitoring wells exceed Maximum Containant Levels and Region 5 Risk Base Screening Levels (RBSLs). TDY installed a groundwater pumping and soil gas recovery system in 1984 to prevent further migration of VOC-impacted groundwater off-site and to remediate VOC-impacted soil (Description of Current Conditions, Teledyne Monarch Rubber Plant No. 1, Hartville, Ohio, IT, 1991). Approximately 20 years of data indicate that the current pumping system effectively prevents off-site migration of VOC's in groundwater. VOC concentrations in groundwater have decreased since system startup, and groundwater elevation measurements indicate hydraulic control has been achieved in the unconsolidated aquifer (IT, 1996). Therefore, no additional corrective measures for the unconfined aquifer, other than continued operation of the current Interim Measure, are indicated.

One off-site well located at 241 Jefferson Street, S.E. had detectable levels of vinyl chloride. Bottled water was immediately provided to the resident and another well was installed and completed in a deeper aquifer. Subsequent sampling and analysis indicate that the replacement well does not contain detectable levels of VOCs (Final Interim Report, IT, 1993).

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[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

X If yes - continue after identifying potentially affected surface water bodies.

____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): The infiltration of impacted perched aquifer groundwater into the storm sewer and its ultimate discharge to Middle Branch Nimishillen Creek approximately 3 miles south of the site.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

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X If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Key groundwater contaminants include: 1,1,1-trichloroethene 240,000 micro grams per liter (µg/L), 1,1-dichloroethane 15,000 µg/L, tetrachloroethene 13,000 µg/L, cis-1,2-dichlorethene 220,000 µg/L, acetone 632,000ug/l and vinyl chloride 4500J µg/L (J = estimated value) (Unsaturated Zone and Perched Unit Aquifer Remediation Pre-Design Study, MACTECH 2004).

No major streams or rivers exist near the plant, but surface water and sediment are present in Swartz Ditch. The Revised Corrective Measures Study (RCMS) included direct contact with sediments in Swartz ditch as a potential exposure pathway, which also constituted a potential ecological risk. That pathway was eliminated by the excavation of sediments and piping of the position of Swartz Ditch on the western side of the railroad tracks during 2002. Currently, the only potential ecological risk pathway is the infiltration of impacted perched aquifer groundwater into the storm sewer and its ultimate discharge to Middle Branch Nimishillen Creek approximately 3 miles south of the site. Storm sewer sampling data indicate that the VOC concentrations in the pipe discharging the site meet the December 2002 OEPA Aquatic Life Criteria (OAC 3745-1). The ditch is potentially interconnected with the perched groundwater in the southern portion of the site. Analytical results indicated the presence of constituents in the sediment downstream of the Facility. In 2001 Swartz Ditch was excavated sediments were excavated as part of a flood control project for the Village of Hartville. The project involved channelization of Swartz Ditch and installation of a 29-inch by 45-inch elliptical concrete storm water line to replace the open ditch. As part of the flood control project, impacted ditch sediments were excavated to a depth of approximately six feet from the

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

point of storm sewer discharge into Swartz Ditch to approximately 475 feet downstream. A total of 2,249 tons of sediment/soils was excavated and disposed of at an approved landfill (Construction Oversight Report Swartz Ditch Improvements, January 2002). Therefore, there is no unacceptable risk to human receptors associated with direct contact with surface water or sediment in Swartz Ditch.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s): Not Applicable

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

____ If no - enter "NO" status code in #8.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Current sampling locations are: Perched Unit monitoring wells IM-1, RFI-30, and RFI-32; Unconsolidated Aquifer: MW-1, MW-4, RFI-6, RFI-7R, RFI-15, RFI-26,BH-5, and BH-20R; Bedrock Aquifer: Northeast Well, West Well, and South Rock Well; Residential Wells: Eicher Well and New Weaver Well, as well as sampling of the air stripper influent and effluent. The monitoring and residential wells are sampled on a quarterly basis and the air stripper influent and effluent are sampled monthly (Design Documents for the Interim Measures, High Vacuum Dual Phase Extraction System, Former Teledyne Monarch Facility, Hartville, Ohio, MACTECH 1999).

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Former Teledyne Monarch Plant 1 facility, EPA ID #OHD 068 901 610, located at 10 Lincoln Park, Hartville, Ohio under current and reasonably expected conditions. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____

(print) John Nordine

(title) Geologist

Supervisor (signature) _____ Date _____

(print) George Hamper

(title) Chief, Corrective Action Section

(EPA Region or State) EPA Region 5

Locations where References may be found:
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