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:	GE Coshocton
Facility Address:	1350 South Second Street Coshocton, OH 43812
Facility EPA ID #:	OHD 004 302 428

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):

Groundwater exceeds the site specific risk-based performance standards in the Consent Order for arsenic (50 ppb) and the new MCL for arsenic (10ppb). Iron and Manganese exceed the Secondary MCLs of 300 ppb (Fe), and 50 ppb (Mn), SMCLs effect the aesthetic quality of the water relating to public acceptance of the drinking water. Mn and Fe results are below the SCMLs in the perimeter wells surrounding the plume. The arsenic values are health based numbers and drive the assessment of groundwater migration.

Ref.: Summary of Groundwater Monitoring Activities Rounds (1-7), 6/13/00 through 4/10/2003.

Foot notes:

[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):

Arsenic results in monitoring wells within the existing area of contaminated groundwater have shown falling or stabilized results within the last 3 years of data. Shallow wells MW-19, MW-16, and MW-24 surround the plume at a shallow level in the aquifer and provide perimeter wells with results below the 10 ppb level for arsenic. Intermediate wells MW-21, MW-25, and MW-22 provide surrounding perimeter wells in the intermediate level in the aquifer and are below 10 ppb for arsenic. The deep well MW-23 is below the 10 ppb arsenic level, but deep well MW-14 is at 34-37 ppb for arsenic. The arsenic results in MW-14 over the last 2 years exhibits a stabilizing trend. The results are 37 ppb (10/24/01), 42 ppb (8/21/02), 14 ppb (11/20/02), and 34 ppb (4/10/03). These results show a slightly falling or stable arsenic level in this well which indicates stability in the deep portion of the plume.

Ref.: Summary of Groundwater Monitoring Activities 6/13/00 through 4/10/03. Field Oversight and Split Sampling Report, GE-Coshocton, May 27, 2003.

[2] "exis
ting 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?

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

_X_ 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):

Equipotential lines show the flow of the groundwater from the aquifer to the Muskingum River [1]. These lines show that only the shallow and intermediate portion of the aquifer, which is shown to be below 10ppb of arsenic at the perimeter of the plume, is able to discharge into the Muskingum River. There is also a regional flow pattern southward in the aquifer following the bedrock valley that follows the flow of the modern Muskingum River.[2]

No evidence of the deep portions of the aquifer recharging the Muskingum River in the vicinity of the facility exists. However, regional flow will dominate at depth outside the discharge influence of the surficial river. Contamination in the deep portions of the aquifer, measured at 34 ppb at the GE Facility and found to be stable over time, may recharge the Muskingum River flow down the bedrock valley. This contamination will mix with river discharge of 8600 cubic feet/second diluting the contamination. Upstream and downstream Muskingum River samples taken in 1985 and 1987 indicate results of less than 3.7 ppb detection limit for arsenic.[3]

[1] Figure 12 from the Description of Current Conditions, General Electric Electromaterials Department, Coshocton, Ohio, August 1988

[2] Coshocton County Ground-Water Resources, Ohio University Extension, AEX-490.16, Golden, Paul E. et al.

[3] Description of Current Conditions, General Electric Electromaterials Department, Coshocton, Ohio, August 1988

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)?

.

_____ 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):

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

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):

[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):

The O&M Plan for the sight requires bi-annual sampling of the monitoring wells on-site and analysis for metals, TOC, and some water quality parameters.[1] These samples, along with a proposed well nest in the area downgradient of MW-14, will define the plume in the deep aquifer as well as provide additional sampling points for the shallow and intermediate areas of the aquifer. An existing well MW-20 will be added to the sampling events to acquire a more complete knowledge of the deep portion of the aquifer. If concentrations increase, or the plume migrates substantially, alternatives for groundwater remediation will be re-evaluated.[2]

[1] Operation and Maintenance Plan, RCRA Corrective Measures Implementation Program, GE Coshocton, February, 2000.

[2] Section 2.5.1, Operation and Maintenance Plan, RCRA Corrective Measures Implementation Program, GE Coshocton, February, 2000.

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 GE Coshocton facility , EPA ID # OHD 004-302-428 , located at_1350 South Second Street, Coshocton, OH 43812. 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) Christopher J. Black
(title) Geologist

Supervisor (signature) _____ Date _____
(print) George Hamper
(title) ECAS Section Chief
(EPA Region or State) U.S. EPA Region 5

Locations where References may be found:
US EPA 77 W. Jackson Chicago IL -7th Floor Records Center or Chris Black's Work Station - 09021.

Contact telephone and e-mail numbers

(name) Christopher J. Black
(phone #) (312) 886-1451
(e-mail) Black.christopher@epa.gov