

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: Expert Management Inc.
Facility Address: 1 River Road, Tamaqua, PA 18252
Facility EPA ID #: PAD071203046

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?

- 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).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 2

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?

_____ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

 X 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):

The Expert Management Inc. (EMI) facility is a 340-acre parcel of the former ICI Explosives USA Inc. site, located in Tamaqua, PA. ICI Explosives USA Inc., predecessor to EMI with the same management team, was granted liability protection under Pennsylvania’s Act 2 program in 1988 for two adjacent parcels (660-acre and 220-acre) it subsequently sold to other parties. In 1997 and 1998, EPA determined, in letters to ICI, that no further corrective action was required at the 220-acre and 660-acre parcels, respectively.

The site is in the lowlands, adjacent to the Little Schuylkill River. Historic waste disposal and burning occurred at this property. Groundwater monitoring wells are located in two former industrial areas, the West Penn Storage Area and the Blasting Supplies Manufacturing Area. Groundwater flow is from the industrial areas, toward the river. Piezometers were placed in the river, and groundwater level measurements were taken under the river during 1999 and 2000. The data shows that the groundwater flow is upward, from the groundwater into the river, making it a gaining stream in the vicinity of the facility. The river is not used as a source of drinking water. The groundwater between the waste handling areas and the river is not currently a source of drinking water and EMI has said that future land-use at the facility will not allow potable wells to be installed at the site. A deed notice will delineate the land-use restrictions. PADEP and EPA plan to approve land-use restriction language before sale of the property.

ICI has conducted quarterly groundwater monitoring at this site between 1992 and 2001. There were 26 monitoring wells involved in the program. Low levels of mercury, antimony, ammonia, and nitrates were found in the groundwater, but not in the adjacent river. No other contaminants were found at levels exceeding their health-based limits.

West Penn Storage Area

In 1999, wastes were removed from disposal areas near the river in the West Penn Storage Area. The wastes had been releasing elevated concentrations of nitrate and ammonia into the groundwater - above the drinking water standard of 10mg/l for nitrate and the 0.21mg/l health-based limit for ammonia. Generally, EPA uses Maximum Contaminant Level (MCLs), safe drinking water levels, to determine whether remediation of groundwater is required. However, in this case, determining an Alternate Concentration Limit (ACL), using site-specific information about future land use and stream characteristics, is appropriate. The groundwater is not used as a drinking water source, and institutional controls (deed notice) will restrict future use of the groundwater.

In 2001, a site-specific risk evaluation of the nitrate level in the groundwater and its affect on possible receptors, in this case, the organisms in the river, was performed by EMI. An ACL of 130 mg/l was proposed by EMI and accepted by EPA and PADEP.

Groundwater monitoring data shows the groundwater met the ACL for 12 consecutive quarters and continues to decrease. The levels of nitrate in groundwater have dropped from 108mg/l in March 1998 to 13mg/l in December 2000, in the monitoring well most directly downgradient of the waste disposal area. In a letter dated October 10, 2001, PADEP (with EPA agreement) allowed EMI to discontinue groundwater monitoring at the site.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 3

Ammonia levels in groundwater at the former waste disposal areas are also elevated, as the waste material contained high concentrations of ammonia as well as nitrates. Since the removal of the waste material in August 1999, the concentrations of ammonia in groundwater have decreased significantly. In the sampling event just after the waste removal, groundwater concentrations in the immediate vicinity of the disposal site were 55.8mg/l and 56.4mg/l. The sampling event 16 months after the waste removal recorded groundwater concentrations of 37mg/l and 36mg/l. Although these levels are above the EPA health-based level which uses potable water as the exposure scenario (0.21mg/l), this groundwater is not a drinking water source. As described above, institutional controls will be used to restrict groundwater use. Pennsylvania's Medium Specific Concentrations (MSCs) applies 30mg/l as an action level for remediation of ammonia in used aquifers. The sampling results in December 2000 show concentrations only slightly above Pennsylvania's MSCs. The concentration of ammonia in groundwater is expected to continue to decrease, as the source has been removed. Ammonia has never been found above MCLs in the adjacent surface water.

Over 6 quarters of sampling, between September 1999 and December 2000, antimony was detected slightly above MCLs on two occasions, at different wells; in September 1999 at 7ug/l and in December 2000 at 14ug/l. The MCL for antimony is 6ug/l. These are isolated incidents and do not represent a contaminant plume. Also over the same 6 quarters of sampling, mercury was found slightly above the MCL of 2ug/l; at 2.8ug/l in September 1999. This also represents an isolated incident, not a plume.

Mercury and antimony have never been found in surface water above their respective MCLs or EPA surface water quality criteria.

Blasting Supplies Manufacturing Area

One well, in the Blasting Supplies Manufacturing Area, consistently has had elevated levels of mercury, historically between 15ug/l and 23ug/l. The MCL for mercury is 2ug/l. In order to further delineate the mercury hit, ICI/EMI installed 5 hydropunches in May 2000, downgradient of the mercury hit. Two rounds of sampling were performed. Only 1 sample above the detection limit of 0.2ug/l was found. A resample of that sampling point was performed, and no detection of mercury was found. The hydropunch data shows that the mercury in groundwater is limited to the one well. It is possible that the mercury in the well is from contamination that occurred during construction of the well, rather than being indicative of groundwater conditions. Soil containing mercury was at the well location during installation, and was removed from the area in 1998 and 1999.

Adjacent surface water has never shown mercury levels above MCLs or EPA surface water quality criteria. Water on this site is not used for potable purposes, and institutional controls over the land use will continue to restrict use of the groundwater.

References:

- Status Report on Groundwater Conditions Project Riverdale - ICI Tamaqua Property, January 12, 2001 (prepared by URS)
- Letter to PADEP: ICI Tamaqua Property, Alternate Concentration Limit for Nitrate (prepared by ENSR), July 18, 2001
- Groundwater Data Compilation - Project Riverdale, ICI Tamaqua Facility, December 8, 1999 (prepared by URS Greiner Woodward Clyde)
- Letter to ICI: Approval of Remedial Investigation Report (signed by Joseph Brogna, PADEP), Jan. 3, 2002
- Letter to ICI: Approval of ACL for Nitrates (signed by Reno Ducceschi, PADEP), October 10, 2001
- Letter to PADEP: Final ACL for Nitrate in Groundwater (signed by Donald Pawlowski), Sept. 28, 2001
- Letter to ICI: No Further Action at Western Parcel (signed by Linda Matyskiela, EPA), August 22, 1997
- Letter to ICI: No Further Action at Wakefield Parcel (signed by Paul Gotthold, EPA), November 6, 1998

Footnotes:

- 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).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 4

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)?

- _____ 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):

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.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 5

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

_____ 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):

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 6

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ 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 concentration³ 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 concentration³ 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 concentrations³ 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 measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 7

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 implemented⁴)?

_____ 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.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 8

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?”

_____ 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):

