



NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Elementis Chemicals, Inc. (Former Harsco Chemical)
Facility Address: 441 Daniel Webster Highway, Merrimack, NH
Facility EPA ID #: NHD 000471771
DES Site #: 198901022

RCRA RECORDS CENTER
FACILITY Elementis
ID. NO. NHD 000471771
FILE NO. R-13
106598

INTRODUCTION

The purpose of this EI Determination is to provide documentation in support of the CA750 determination entered in the RCRAinfo for this site. The New Hampshire Department of Environmental Services, as an authorized Corrective Action Program, manages this site under the State Program to assure that conditions at the site do not adversely affect the protection of human health and the environment. Documentation to support this EI Determination is presented for each criterion and is consistent with the United States Environmental Protection Agency requirements. All reports referenced are available for review at the Department's office and a limited number of reports are available on the Department's internet web site.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to look beyond programmatic activity to track changes in the quality of the surrounding environment. The two EI developed to-date address the quality of the environment in relation to current human exposures to contamination, and the migration of contaminated groundwater.

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 a monitoring program is in place to confirm that contaminated groundwater subject to RCRA corrective action associated with the identified facility remains within the original delineated boundaries.

Relationship of EI to Final Remedies

¹ 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.

² 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.

The EI are near-term objectives which are currently being used as Program measures to satisfy requirements of the Government Performance and Results Act of 1993, (GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains only to the physical migration and spread of contaminated ground water and contaminants (e.g., non-aqueous phase liquids) within groundwater. Final remedies remain the long-term objective of the RCRA Corrective Action program, and achieving this EI does not substitute for other stabilization or final remedy requirements. Wherever practicable, contaminated groundwater is to be restored to conditions 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).

Applicable Acronyms

- The New Hampshire Department of Environmental Services - Department
- Ambient Groundwater Quality Standards – AGQS
- Risk Characterization and Management Policy – RCMP
- Groundwater Management Permit – GMP
- Groundwater Management Zone -GMZ
- Remedial Action Plan - RAP
- Surface Water Quality Standards – SWQS
- Volatile Organic Compounds - VOCs
- 1,1- Dichloroethylene – 1,1-DCE
- 1,1-Dichloroethane – 1,1-DCA
- Cis-1,2-Dichloroethylene – cis-1,2. DCE
- Tetrachloroethylene – PCE
- Trichloroethylene - TCE
- Vinyl chloride – VC

DETERMINATION

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

if data are not available, skip to #8 and enter "IN" (more information needed) status code.

2. Is groundwater known or reasonably suspected to be "contaminated" above

appropriately protective "levels" (i.e., AGQS) 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):

A total of 25 different compounds have been detected in Site groundwater. AGQS is exceeded for 1,1-DCA, 1,1-DCE, Cis-1,2, DCE, PCE, TCE, VC, Naphthalene, Ethylbenzene and Chromium.

- 2005 Annual Summary Report Dated January 2006

3. Has the migration of contaminated groundwater stabilized and is it 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 GMZ..
	If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the GMZ - 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):

GMP GWP-198901022-M-02 requires Elementis to complete regular monitoring of groundwater and surface water to ensure that the contaminant plume does not extend past the Groundwater Management Zone. This is the existing area of known contamination and based on the analytical data submitted by Elementis, the size and concentration of the contaminant plume is stable or decreasing.

- Groundwater Management Permit Renewal Application dated November 2002
- GMP GWP-198901022-M-002 dated January 2003

- Submittal of Additional Information in response to Department comments on the Remedial Action Implementation and Annual Groundwater Monitoring Report dated March 2004
- 2005 Annual Summary Report dated January 2006

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

X	If yes - continue after identifying potentially affected surface water bodies.
	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 Souhegan River and Baboosic Brook form the boundary of the site on southern and eastern boundary.

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 AGQS and does not exceed the Department's SWQS, 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)?

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 <u>key</u> 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 of <u>each</u> contaminant discharged above its SWQS "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 greater than the SWQS, 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):

Groundwater sampling results over the last few years have shown that the source removal activities and ISCO injection applications have resulted in a significant reduction in VOCs and other compounds in site groundwater. Concentrations of VOCs in surface water have declined substantially. There have been minor detections of VOCs in surface water since October 2004, none have exceeded SWQS. VOCs and metals have been detected in adjoining sediments. Elementis has determined the levels pose little or no risk. The Department's Ecological Risk Assessor agreed that the human risk was minimal, however questioned the determination and the results. Therefore, the Department has agreed to allow the groundwater remediation to proceed and upon meeting the site performance standard revisiting the sediment issue for any ecological risk. See the following reports:

- Sediment sampling plan dated April 2004
- Report on Sediment Sampling dated July 2004
- Elementis letter dated November 12, 2004
- Department letter dated December 1, 2004
- 2005 Annual Summary Report dated January 2006
- Semiannual Groundwater Monitoring Report dated June 2006

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 implemented³)?

	<p>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,⁴ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialist, 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:</p>
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	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):

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 GMZ?

X	If yes - continue after providing or citing documentation for planned activities or future sampling measurement events. Specifically identify the document that ensures that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the GMZ.
	If no - enter "NO" status code in #8.

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

Rationale and Reference(s):

Groundwater and surface water monitoring will continue as required by the GMP. This requires notification if contaminated groundwater migrates past the GMZ or any violations of the Department's SWQS.

- GMP GWP-198901022-M-002 dated January 2003

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.

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X	YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. 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) David Bowen 8/16/06 Date
David Bowen
Hydrogeologist

Supervisor (signature) Kenneth Kettenring Date 8/16/06
Kenneth Kettenring
Hydrogeologist

Locations where References may be found:

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