RDMS DocID 109793

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: Gem Management, Inc. (*former* Olin Hunt)
Facility Address: One Wellington Road, Lincoln, Rhode Island, 02865
Facility EPA ID #: RID095976544

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 #8 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 nearterm 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?

_____ 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):

In late 1979 groundwater contaminated with volatile organic compounds (VOCs) was discovered in the North Central Industrial Park (NCIP), Lincoln. Several sources of the groundwater contamination were identified in the NCIP, including leaks from Hunt Chemical's underground piping for its waste water treatment system. Hunt Chemical property was placed on CERCLIS in 1981. Between 1983 and 1984 Olin Corporation purchased the Hunt Chemical property (now referred to as the Olin Limerock Facility). Operations at the facility ceased in January 1991. Olin began to manage groundwater contamination on a "voluntary" basis in October 1988. The remedy consisted of a groundwater pump & treat system which incorporated interceptor wells, monitoring wells, piezometers, carbon treatment of extracted water, NBC discharge under a POTW permit, and quarterly monitoring. This system was not formally approved under the Remediation Regulations until November 20, 1998, through an Order of Approval which added a bioremediation component consisting of biosparging and bioventing to augment the then ongoing pump & treat system. The remedial objectives (on-site – DEM's Method 1 GB Groundwater Objectives; and at the downgradient property line – DEM's Method 1 GA Groundwater Objectives) have been achieved, and a Letter of Compliance was issued by DEM on June 10, 2002.

Order of Approval, November 20, 1998 - ATTACHED

Letter of Compliance, June 10, 2002 - ATTACHED

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[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)?

   _____ 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.

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):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentrations 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 concentrations 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 judgment/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 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.

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):

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[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?"

   _____ 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):

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 Gem Management, Inc. (former Olin Hunt) facility, EPA ID # RID095976544, located at One Wellington Road, Lincoln, Rhode Island, 02865. 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 Joseph T. Martella II — Date 7-13-11
Joseph T. Martella II
Senior Sanitary Engineer

Supervisor Kelly J. Owens — Date 7/13/11
Kelly J. Owens
Supervising Engineer
EPA Region 1, Rhode Island

REV'D BY F.B.
OK - 7/18/11

Locations where References may be found:
RIDEM/OWM FILE

Contact telephone and e-mail numbers:

Name: Joseph T. Martella II
Phone #: (401) 222-2797 x7109
E-mail: joseph.martella@dem.ri.gov

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

CERTIFIED MAIL

November 20 1998

Michael J. Bellotti, P.G.
Senior Associate Hydrogeologist
Olin Chemicals - Olin Corporation
P.O. Box 248
Lower River Road
Charleston, TN 37310

RE: Olin Limerock Facility
One Wellington Road, Lincoln, Rhode Island
Case No. 98-035

Dear Mr. Bellotti:

Enclosed please find the **Order of Approval** (Order) for the proposed groundwater remediation for the above referenced site. Please review the stipulations of this Order thoroughly to ensure your compliance with the requirements.

Please notify this office 48 hours prior to the beginning of any work related to the remediation of the property. If you have any questions regarding this matter, please contact Joseph T. Martella II at (401)-222-2797, ext. 7109.

This order shall be recorded in the land evidence records of the facility's town as required by law.

Sincerely,

Terrence D. Gray

Terrence D. Gray, P.E.
Chief, Office of Waste Management

cc: Ed Szymanski, Associate Director, RIDEM
Greg S. Fine, Supervising Engineer, RIDEM/OWM
Joseph T. Martella II, Engineer, RIDEM/OWM
Claude Cote, Esquire, RIDEM/Office of Legal Services
Janet Whelan, Olin

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

In the matter of the application
for Remedial Action Approval at:
Olin Limerock Facility
One Wellington Road
Lincoln, Rhode Island

Case No. 98-035

ORDER OF APPROVAL

In the above entitled matter wherein **Olin Corporation (Olin), in its capacity as Owner of the Olin Limerock Facility site located at One Wellington Road in Lincoln, Rhode Island, more specifically identified as Lots 2 and 137 of Plat 28 in the Town of Lincoln, Rhode Island,** filed with the Rhode Island Department of Environmental Management, Office of Waste Management (the Department) the following documents which collectively fulfill the requirements of Section 9.00 Remedial Action Work Plan (RAWP) of the Department's amended Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations):

Remedial Action Work Plan, For The Limerock Facility, Lincoln, Rhode Island, prepared by Envirogen, Inc. dated July 1997;

Letter response to the Department's comments prepared by Olin dated 23 October 1997;

Letter response to the Department's comments prepared by Olin dated 9 September 1998;

Letter response to the Department's comments prepared by Olin dated 16 September 1998; and

RAWP addendum letter prepared by Olin dated 7 October 1998.

The RAWP describes a plan or means to prevent pollution as defined in Chapter 46-12 of the General Laws of 1956, as amended and the Department's Remediation Regulations, as amended August 1996 in accordance therewith.

Upon consideration thereof, the Department approves said plan or means to prevent pollution provided that:

1. The remedy as described in the RAWP shall be implemented within ninety (90) days of receipt of this Order;

2. Sampling of all media involved in the Remedial Action shall be conducted in accordance with the requirements of the RAWP and its addendum;

3. The on-site groundwater remediation goal shall be the Department's Method 1 GB Groundwater Objectives, with the additional application of the Department's Method 1 GA Groundwater Objective for xylene, in accordance with the Remediation Regulations. The groundwater remediation goal at the downgradient property boundary shall be the Department's Method 1 GA Groundwater Objectives in accordance with the Remediation Regulations;

4. The remedy as described in the RAWP shall incorporate the existing operating groundwater pump and treat component and the Department approved bioremediation component consisting of biosparging and bioventing;

5. Quarterly sampling to monitor the groundwater quality shall be conducted in all groundwater monitoring wells according to the RAWP and the Remediation Regulations and will continue until such time as the Department determines that acceptable levels of contamination have been achieved and the remedy has been deemed successful;

6. Removal of the remedial system at the conclusion of the remedy will be contingent upon final Department approval;

7. Remedial Action Status Report(s), periodic monitoring reports and a closure report shall be submitted to the Department in accordance with the RAWP and the Remediation Regulations;

8. Results of all environmental sampling and status reports shall be sent to the Department in accordance with item 14;

9. All waste derived from implementation of the RAWP shall be managed in accordance with the Remediation Regulations and Department Policy Memo 95-01;

10. Remedial work must be consistent with Section 11.00 Remedial Action in the Remediation Regulations;

11. The Department shall be immediately notified of any site or operation condition that results in non-compliance with this Order;

12. Any Remedial Action interruptions other than those necessary for sampling, inspection or adjustment of operation shall be reported to the Department by telephone within one (1) working day and in writing with seven (7) days in accordance with item 14;

13. This Order of Approval does not remove Olin's obligation to obtain any necessary permits from other state, local, or federal agencies;

14. All notices and submissions should be sent to:

Joseph T. Martella II
Department of Environmental Management
Office of Waste Management
235 Promenade Street, 3rd Floor
Providence, RI 02908-5767
Telephone Number (401) 222-2797, Ext.7109

15. This Order shall be recorded in the Town land evidence records of the subject property.

This Order shall remain in full force and effect as long as said system or means shall be operated and maintained in a condition satisfactory to the Department of Environmental Management. Failure to comply with all points stipulated in this Order shall result in the issuance of a Notice of Violation and Order against the owner of the property.

This Order shall be subject to modification or revocation in accordance with the law.

Entered as an Order of the Department of Environmental Management this 20th day of November, 1998.

By: Terrence D. Gray
Terrence D. Gray, PE
Chief, Office of Waste Management
Department of Environmental Management

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

June 10, 2002

CERTIFIED MAIL

LETTER OF COMPLIANCE
CASE # 98-035

Bruce R. Iannuccillo
President
BBI Realty, Inc.
70 Calverley Street
Providence, RI 02908

RE: Former Olin Limerock Facility, 1 Wellington Road, Lincoln, Rhode Island
Plat 28, Lot 137

Dear Mr. Iannuccillo:

On 4 September 1996 the Rhode Island Department of Environmental Management (the Department) enacted the amended Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced site, the Department's Office of Waste Management (OWM) has received and reviewed the following documents submitted on behalf of the BBI Realty, Inc. (BBI) and Olin Corporation (Olin):

1. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: First Quarter, 1999, prepared by Olin, dated 28 May 1999;

2. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Second Quarter, 1999, prepared by Olin, dated 30 August 1999;

3. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Third Quarter, 1999, prepared by Olin, dated 9 November 1999;

4. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Fourth Quarter, 1999, prepared by Olin, dated 31 January 2000;

30% post-consumer fiber

5. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: First Quarter, 2000, prepared by Olin, dated 16 May 2000;

6. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Second Quarter, 2000, prepared by Olin, dated 4 August 2000;

7. Olin Limerock Facility, Lincoln, RI, Case No. 98-035, Quarterly Report: Third Quarter, 2000, prepared by Olin, dated 22 November 2000;

8. Olin Limerock Facility, Lincoln, RI, Case No. 98-035, Quarterly Report: Fourth Quarter, 2000, prepared by Olin, dated 2 February 2001;

9. Quarterly Groundwater Sampling and Request for Interim Letter of Compliance, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 14 June 2001;

10. Quarterly Groundwater Sampling, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 21 July 2001;

11. Quarterly Groundwater Sampling, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 12 October 2001;

12. Quarterly Groundwater Sampling and Final Closure Report, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 2 March 2002; and

13. Copy of the recorded (stamped)Environmental Land Usage Restriction (ELUR) for Town of Lincoln Plat 28, Lot 137, submitted by BBI, recorded and received by the Department on 23 May 2002.

Based upon the information contained in these submittals and the recording of the ELUR on 23 May 2002, the Department has concluded that the above referenced property is in compliance with the Remediation Regulations at this time.

Be advised that the Department reserves the right to require additional actions under the aforementioned Remediation Regulations at the subject property should any of the following occur:

A. Conditions at the site, previously unknown to the Department are discovered;

B. Information, previously unknown to the Department becomes available;

C. Policy and/or regulatory requirements change; or

D. Failure by the BBI, or any future holder of any interest in the property, to adhere to the terms and conditions of the Environmental Land Usage Restriction for the property.

Nothing in this Letter of Compliance relieves the responsible party nor the site from compliance with all other applicable State or Federal regulations.

If you have any questions regarding this letter, please contact me at (401) 222-2797 x7109.

Sincerely,

Joseph T. Martella II, Senior Engineer
Office of Waste Management
Department of Environmental Management

Authorized by,

Kelly J. Owens

Kelly J. Owens, Supervising Engineer
Office of Waste Management
Department of Environmental Management

cc: Leo Hellested, P.E., Chief, RIDEM/OWM