

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: Giant Resource Recovery, Incorporated (Former Solite Corporation
Virginia Solite Division Facility) - Cascade, VA - EPA ID No.
VAD046970521 (Also incorporates former GRR, Inc. Facility,
EPA I.D. No. VAD077942266)

Facility Address: Cascade, VA

Facility EPA ID #: VAD046970521 & VAD077942266

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).

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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:

Solite Corporation, VA Solite Division - Cascade Plant (Solite) formerly produced lightweight aggregate used in manufacture of lightweight masonry units, pre-cast elements, structural concrete and other building materials from 1957 to 2004. Initial operations utilized coal as a primary fuel source for the kilns. The processing facilities are located in Town of Cascade, Pittsylvania County, Virginia. Raw materials were primarily obtained from the on-site-slate quarry (lake), located in Rockingham County, North Carolina. In the 1970s, Solite began to use alternative liquid (hazardous waste derived) fuels to provide the energy. The liquids included solvents and other hydrocarbons. The liquid was ignitable (D001) and contained numerous listed hazardous wastes and was subject to the requirement of Solite Hazardous Waste Management Permit under EPA ID number VAD046970521 which became effective January 19, 2004.

Giant Resource Recovery, Inc. (GRR) (formerly Oldover Corporation) owns and formerly operated its hazardous waste storage and blending facility (SWMUs Group T) on the site. The GRR Hazardous Waste Management Permit (EPA ID No. VAD077942266) became effective January 20, 1996 and expired on January 29, 2006.

Both Solite and GRR initiated RCRA Closure in accordance with the requirements of the GRR Permit. Final Closure Reports for the Solite and GRR closure activities were submitted on October 21, 2005 and November 23, 2005, respectively. In July 2006, Solite Corporation received the DEQ's approval of the "clean closure" certifications from both facilities.

A total of 26 SWMUs and 6 AOCs have been identified. The Phase I RCRA Facility Investigation (RFI) work was performed in October-November 2005, and December, 2005.

The Phase I RFI indicated that there currently six (6) monitoring wells and a water supply well on the property. Most groundwater monitoring wells utilized for the RFI workplan/report (MW-1 to MW-6, and one water supply well) are located around the Quarry Lake. At the east, west and north sides of the Group T Area (hazardous waste storage and fuel blending area) and the Group K Area (within which Baghouse is located), no wells were installed. The above groundwater monitoring wells were installed as part of due diligence activities associated with a potential property acquisition. Groundwater samples were collected from the six monitoring wells and the water supply well and were analyzed for VOCs, PAHs, TPH-DRO and RCRA metals. Additionally, one groundwater sample was collected by the Department of Environmental Quality in the tank farm area from a subsoil boring investigation. Analytical results indicate that the concentrations of constituents in groundwater are below the EPA Region III risk based criteria (RBC) for tap water and EPA maximum concentration levels (MCL). Based on the findings of the Phase I RFI the Department determined that additional investigation was required to further evaluate the site in the form of a Phase II RFI workplan.

The facility submitted a summary of the December 2010 and January 2011 confirmation sampling activities performed at the site in April 2011. The activities were performed in accordance with the Phase II RCRA Facility Investigation (RFI) Work Plan - Revision 01 (Arrowhead, March 2009) and subsequent correspondence. The Phase II investigative work included the installation of one (1) monitoring well

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(MW-7) within the Group K area and collection of groundwater elevation data to evaluate groundwater flow direction and one (1) groundwater sample to analyze for arsenic and dioxins and furans. In addition, the facility was to collect a groundwater sample from MW-4 and analyze for the Resource Conservation and Recovery Act (RCRA) list of metals. The Phase II RFI activities were completed by GRR in December 2010 and January 2011. The investigation activities and data presented within the April 2011 report (January 2011 Confirmatory Sampling Results) concluded the following: Groundwater flow is confirmed to be to the north/northwest; barium and chromium were detected in MW-4 below the RBC and MCL; arsenic was detected in MW-7 above the RBC but below the MCL; and OCDD (octachlorodibenop-dioxin) was detected in MW-7 below the RBC. No other detections of RCRA metals or dioxins and furans were reported by the laboratory and consequently no further screening of the data is required. The Phase I and Phase II results indicate that groundwater concentrations are below MCLs, and below RBCs where no MCL is available, across the site.

REFERENCES:

- Phase I RCRA Facility Investigation Workplan (revised March 2007)
- EPA Region III Risk Based Screening Levels
- Phase II RCRA Facility Investigation (RFI) Work Plan - Revision 01 (Arrowhead, March 2009) & associated correspondence.
- January 2011 Confirmatory Sampling Results (April 1, 2011)

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).

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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.

Footnotes:

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.

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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):

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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 – skip to #8 and enter “IN” status code.

RATIONALE AND REFERENCE(S):

Footnotes:

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

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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 ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
- (2) providing or referencing an interim-assessment⁵, 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 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 – skip to #8 and enter “IN” status code.

RATIONALE AND REFERENCE(S):

Footnotes:

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.

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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. 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.

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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).

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 GRR Cascade facility, EPA ID # VAD046970521 & VAD077942266, located in Cascade, Virginia. 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 _____ Date 5/9/2012
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FINAL NOTE: THE MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL EI IS A QUALITATIVE SCREENING OF CURRENT GROUNDWATER CONDITIONS AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF GROUNDWATER QUALITY.