

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:	Solite LLC (former Solite Corporation)
Facility Address:	Arvonias, VA
Facility EPA ID #:	VAD042755082

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).

Table 1:

Constituent of Concern	Background Concentration (mg/kg)	Region 3 SSL (mg/kg)	Maximum Observed Soil Concentration (mg/kg)
Kiln Area (Solite)			
Arsenic	28.2	0.026	30.6
Nickel	22	na	32.5
Baghouse Area (Solite)			
Arsenic	28.2	0.026	29
Nickel	22	NA	41.3
Tank Farm Area (Grr-Arvonio)			
Arsenic	28.2	0.026	252
Chromium	36.9	42	345
Used Oil Area (Solite)			
Nickel	22	NA	84.9
Chromium	36.9	42	55.7
Surface Impoundment Area (Grr-Arvonio)			
Arsenic	28.2	0.026	48.7
Nickel	22	NA	51
Cadmium	1.5	27	65
Chromium	36.9	42	71
Selenium	<1.2	19	29
Waste Oil Area (Solite)			
Arsenic	28.2	0.026	46.3
Diesel Tank Area (Solite)			
Nickel	22	NA	33.7

Table 2:

Monitoring well	MW-5	MW-6	MW-7	MW-8	Background Concentration (mg/kg)	Region 3 SSL
<i>Approximate Location</i>	<i>Tank Farm area</i>	<i>North of Tank farm</i>	<i>Northeast of Kiln area</i>	<i>North of Kiln area</i>		
Antimony	42	23		24	NA	13
Arsenic	30	< BKG	65	68	28.2	0.26
Chromium	87	< BKG	< BKG	< BKG	36.9	42
Selenium	46	27	<BKG	31	<1.2	19
Thallium	68.6	34.3	23.9	33.8	NA	3.6

The DEQ concludes that it is reasonable to suspect that groundwater is contaminated in these areas and further evaluation will be needed in a RCRA Facility Investigation (RFI).

References:

Evaluation of DEQ Collected Data – Revision 1, November 3, 2005
 EPA Risk Based Screening Levels

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):

Groundwater onsite most likely flows to the north-northeast, towards the Slate River and the James River. A line of perimeter monitoring wells are installed between the facility and the rivers. Please note that this line of wells intercepts the expected flow path of groundwater from MW-8 (location of MCL exceedance) to the river. Concentrations of the hazardous metals in these wells are below screening levels (RBC for tap water and MCLs). Please see Table 3 below. Therefore, the migration of potentially contaminated groundwater is considered stable.

Table 3:

Constituent	Concentration at MW-1	Concentration at MW-2
Antimony	ND	ND
Arsenic	ND	ND
Chromium	ND	ND
Cadmium	BD	ND
Nickel	BD	ND
Selenium	ND	ND
Thallium	ND	ND

References:

Evaluation of DEQ Collected Data – Revision 1, November 3, 2005
EPA Risk Based Screening Levels

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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):

Groundwater onsite most likely flows to the north-northeast, towards the Slate River and the James River. A line of perimeter monitoring wells is installed between the facility and the rivers. Concentrations of the constituents of concern in these wells are below screening levels; therefore, it is unlikely that contaminated groundwater discharges to the rivers.

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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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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 Solite LLC facility, EPA ID # VAD042755082, located in Arvon, 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	9/27/07
	(Print) Heather Lloyd		<i>Heather Lloyd</i>
	(Title) Environmental Specialist II		

Supervisor		Date	9/27/07
	(Print) <i>Leslie A. Romanchik</i> Leslie A. Romanchik		
	(Title) Director, Office of Hazardous Waste		
	(EPA Region or State) III/VA		

Locations where References may be found:

Department of Environmental Quality
Office of Hazardous Waste, Groundwater
629 East Main Street
Richmond, VA 23219

Contact telephone and e-mail numbers:

(Name)	Heather Lloyd
(Phone #)	(804)-698-4306
(e-mail)	helloyd@deq.virginia.gov