

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: Sims Metal Management (formerly Sierra Recycling/Old Dominion Wood Preservers)
Facility Address: 1177 Hosier Road, Suffolk, VA 23435
Facility EPA ID #: VAD980918221

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 #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 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)**

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.
- 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):

General Facility Information:

The subject property, which is 10-acres in size, is zoned as M-2 (heavy industrial) and located at 1177 Hosier Road, Suffolk, Virginia, approximately two (2) miles south of downtown Suffolk, Virginia. The first industrial use of the site was by Old Dominion Wood Preservers (Old Dominion) which operated from January 1984 up to June 1990. Old Dominion treated wood with a chromated copper arsenate (CCA) solution and/or with a fire retardant solution of ammonium phosphate. Sierra Recycling, Inc. (dba Virginia Soils Reclamation, Inc.) acquired the site in 1993 and received and biologically treated petroleum contaminated soils until the mid-1990s. Reportedly, a rubber shredding operation leased a portion of the site in the mid-1990s; however, no documentation to confirm such operation has been found. In early 2006, Sims Metal Management purchased the site and currently operates a scrap and iron metals recycling facility.

Groundwater Contamination:

Groundwater samples collected from monitoring wells W-9 and W-11 during a Phase I RCRA Facility Investigation (RFI) at the subject site indicated exceedances of EPA’s MCLs for arsenic, chromium and/or lead. Arsenic was detected at 0.04 mg/L at monitoring well W-9 and at 0.02 mg/L at monitoring well W-11 above EPA Region 3’s Risk Based Concentration (RBC) of 0.0000446 mg/L and EPA’s Maximum Contaminant Level (MCL) of 0.01 mg/L. Chromium was detected at monitoring well W-11 at a concentration of 0.13 mg/L above EPA Region 3’s RBC of 0.01095 mg/L and MCL of 0.1 mg/L. Lead was also detected in monitoring well W-11 at 0.06 mg/L above EPA’s MCL of 0.015 mg/L. Monitoring wells W-9 and W-11 were resampled in 2009; however, well W-9 was replaced because the polyvinyl chloride (PVC) casing was damaged. Monitoring well W-9 was replaced with the same construction details as the original well and is located approximately ten feet south of the original well W-9. The new well is referred to as W-9R. Monitoring well W-9R was sampled for arsenic which was detected at 0.122 mg/L which exceeds EPA’s MCL. Well W-11 was sampled for arsenic, chromium and lead, with detections of 0.015, 0.200 and 0.069 mg/L, respectively. Arsenic and chromium exceeded EPA’s MCL and EPA Region 3’s Regional Screening Levels (RSL) for tap water, and lead exceeded the EPA MCL.

References:

- (1) Groundwater Monitoring Report for Sims Metal Management, March 2010.
- (2) Phase I RCRA Facility Investigation Workplan for Sims Hugo Neu, December 2006.
- (3) Final Closure Report for Sierra Recycling Facility, August 2004.
- (4) Statistical Analysis and Risk-Based Closure Assessment for Sierra Recycling Facility, December 1998.
- (5) Sierra Recycling HWMU Closure, Final Closure Report, Volume 1 of 4, September 1998.
- (6) Sierra Recycling File Review/Action Items Memorandum from Mark Campbell to Maria Nold, Lora Fly and Lisa Lillis, August 2001.
- (7) Site Characterization Report for Former Old Dominion Wood Preservers, July 1993.

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)**

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):

The site, which is located in southeast Virginia on the coastal plain, is approximately 64 feet above sea level and gently crowns with the topography with the northern half sloping to the north and east (toward the Atlantic Ocean) and the southern half gently sloping to the south (toward the Great Dismal Swamp). According to historical reports, groundwater flow across the site is to the north or northwest and the depth to groundwater ranges between 4-7 feet below ground surface (bgs). The areas at the site where arsenic, chromium and/or lead have been detected in groundwater above EPA’s MCLs include the Former Kiln Shed and the Western Metal Building (Former Wood Treatment Area). Monitoring well W-11 is located in the vicinity of the Former Kiln Shed and monitoring well W-9 is located in the vicinity and downgradient of the Former Wood Treatment Area. A review of groundwater analytical data from 2005 and 2009 for both of these wells indicates that levels of arsenic, chromium, and/or lead have remained consistent.

To determine whether the contaminated groundwater has stabilized, EPA reviewed the location of monitoring wells at the site and associated groundwater analytical data. Taking into account that groundwater flow at the site is to the north or northwest, monitoring wells W-8, W-12, and W-13 are located downgradient of the Former Kiln Shed. In 2005, arsenic, chromium and lead were non-detect in wells W-8, W-12, and W-13, indicating that groundwater contamination in the vicinity of the Former Kiln Shed has not migrated. With respect to the Former Wood Treatment Area, monitoring wells W-6 and W-10 are located downgradient of this area. Analytical data for monitoring well W-6 from 2005 shows that arsenic and lead were not detected; however, chromium was detected at a concentration of 0.03 mg/L. The detection of chromium is not considered significant because is well below EPA’s MCL of 0.1 mg/L. The 2005 analytical data for monitoring well W-10 shows that arsenic, chromium and lead were not detected. In addition to the groundwater monitoring data, the explanation for the limited migration of arsenic, chromium and lead from the areas identified above is related to the chemistry of these metals. Typically, metals bind to the soil substrate so that they are effectively immobile and not likely to dissolve in and migrate with groundwater.

Therefore, based on a review of historical groundwater monitoring and groundwater flow data, EPA has determined that the migration of arsenic, chromium and lead contaminated groundwater in the vicinity of the Former Kiln Shed and Western Metal Bldg. areas has stabilized.

References:

- (1) Groundwater Monitoring Report for Sims Metal Management, March 2010.
- (2) Phase I RCRA Facility Investigation Workplan for Sims Hugo Neu, December 2006.
- (3) Final Closure Report for Sierra Recycling Facility, August 2004.
- (4) Statistical Analysis and Risk-Based Closure Assessment for Sierra Recycling Facility, December 1998.
- (5) Sierra Recycling HWMU Closure, Final Closure Report, Volume 1 of 4, September 1998.
- (6) Sierra Recycling File Review/Action Items Memorandum from Mark Campbell to Maria Nold, Lora Fly and Lisa Lillis, August 2001.
- (7) Site Characterization Report for Former Old Dominion Wood Preservers, July 1993.

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,

(9/2/2010)

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)**

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):

The closest surface water body to the site is a tributary located approximately 0.5 miles to the south that flows to Pocasin Lades and the Great Dismal Swamp. Since EPA has determined that groundwater contamination at the site is localized to the immediate vicinity of the Former Kiln Shed and the Former Wood Treatment Area and that such contamination has stabilized, it has been concluded that contaminated groundwater at the site does not discharge into surface water bodies.

References:

- (1) groundwater Monitoring Report for Sims Metal Management, March 2010.
- (2) Phase I RCRA Facility Investigation Workplan for Sims Hugo Neu, December 2006.
- (3) Final Closure Report for Sierra Recycling Facility, August 2004.
- (4) Statistical Analysis and Risk-Based Closure Assessment for Sierra Recycling Facility, December 1998.
- (5) Sierra Recycling HWMU Closure, Final Closure Report, Volume 1 of 4, September 1998.
- (6) Sierra Recycling File Review/Action Items Memorandum from Mark Campbell to Maria Nold, Lora Fly and Lisa Lillis, August 2001.
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**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

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)**

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-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 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):

⁴Note, 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.

⁵The 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)**

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):

EPA has requested additional groundwater sampling from select monitoring wells at the site to verify that arsenic, chromium and/or lead contaminated groundwater has not migrated from the Former Kiln Shed and Former Wood Treatment Area. Such samples will be analyzed for arsenic, chromium and lead.

