

**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:** WOOD PRESERVERS, INC.  
**Facility Address:** PO Box 158, 15939 Historyland Highway, Warsaw, VA 22572  
**Facility EPA ID #:** VAD 003113750

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).

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2. Is **groundwater** known or reasonably suspected to be “**contaminated**”<sup>1</sup> 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):**

REFERENCES: RFI Report (June 2003), Natural Attenuation of Chromium Laboratory Test Work and Analysis (April 2004), Letter Scope of Work for Groundwater Level "Rebound" Evaluation (May 2004) and previously submitted quarterly/semi-annual/annual groundwater monitoring reports, 1986 to present.

**RATIONALE:**

Groundwater monitoring activities have identified elevated concentrations of organic constituents in shallow groundwater in the immediate vicinity of the closed Surface Impoundment (SI). Measured concentrations of wood preserving constituents such as Dibenzofuran, 2,4-Dimethylphenol, Naphthalene, Phenanthrene, *o*-Cresol, and 2-Methylnaphthalene have exceeded applicable MCLs or residential ACLs (see attached tables).

**Footnotes:**

<sup>1</sup>“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”<sup>2</sup> 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”<sup>2</sup>).

\_\_\_\_\_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

**Rational and Reference(s):**

REFERENCES: RFI Report (June 2003) and previously submitted quarterly/semi-annual/annual groundwater monitoring reports, 1986 to present.

RATIONALE: Groundwater monitoring wells have been installed across the facility over the last 18 years in response to monitoring and investigation requirements under both RCRA and Clean Water Act permitting programs. Shallow wells located at the site are adequate to evaluate groundwater releases from SWMUs, the regulated units, and areas of concern. In addition, deeper wells are located downgradient of the closed surface impoundments to monitor the identified groundwater plume in the vertical direction.

The facility is currently conducting groundwater monitoring in accordance with a Consent Order for Post-closure care (issued by the Commonwealth in lieu of a post-closure permit) and a NPDES permit issued by the Commonwealth. In addition, hydraulic containment of the groundwater contaminant plumes associated with the closed regulated units is maintained through a series of five groundwater extraction wells. Extracted water is used as process water.

Although a well-developed plume associated with the regulated units has been identified, groundwater concentrations have been slowly decreasing since the interim measure was implemented in 1986 and the vertical extent of the plume as identified by the deeper wells on site is stable. In addition, monitoring wells with measured concentrations above the established residential clean-up standards are located within the capture zone of the hydraulic containment system. As a component of the RFI Workplan, in December 2001, all shallow monitoring wells were sampled at the facility for the constituents of concern to address this EI. The result of this sampling event indicated that the plume has not migrated beyond the facility boundary and remains proximate to the surface impoundments closed as landfills.

Installation of four additional wells was included in the RFI Workplan and the results are currently under review in accordance with the Facility Lead Agreement in place between the facility, the EPA and the Commonwealth. However, preliminary review of the site-wide groundwater data indicates that the additional wells have further defined the contaminant plumes in the vicinity of the Old Treating Plant Area (AOC 2) and the Former Tank Farm (SWMU 10). Interim measures are under consideration for both areas. The determination that the groundwater plume is not migrating beyond the defined area of contamination will be re-evaluated following the implementation of any interim measures and annually thereafter.

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

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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

  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):**

The nearest potential location of groundwater discharge to surface water (an unnamed tributary to Little Totusky Creek) is approximately 1600 feet to the southeast of the farthest extent of hazardous waste constituents identified in groundwater. As indicated in Questions 2 and 3 above, the extent of hazardous waste constituents detected in groundwater is extremely limited in nature, both laterally and vertically, has stabilized, and poses no potential for migration to and beyond the downgradient facility boundary. As a result, there is little to no potential for constituent discharge to surface waters.

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> 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)?

N/A

\_\_\_\_\_ 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<sup>3</sup> 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 concentration<sup>3</sup> 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<sup>3</sup> 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):**

Footnotes:

<sup>3</sup> 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 implemented<sup>4</sup>)?

N/A

\_\_\_\_\_ 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<sup>5</sup>, 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):**

Footnotes:

<sup>4</sup> 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.

<sup>5</sup> 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?”

  X   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):**

The Consent Order for Post-closure Care of the regulated units and the NPDES Permit require continued groundwater monitoring. The post-closure care period for the facility extends to September 19, 2018. In addition, the RFI Workplan outlines additional monitoring and investigations to be conducted across the facility. Proposed Interim Measures are included in the RFI Report currently under review.

