

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS code (CA725)**

**Current Human Exposures Under Control**

Facility Name: **Former Royster Facility**  
Facility Address: **Money Point, Pratt Street, Chesapeake, Virginia**  
Facility EPA ID #: **VAD 003 178 126**

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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 "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "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 "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**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. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater		X		
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2 ft)		X		
Air (outdoors)		X		

- If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.
- If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.
- If unknown (for any media) - skip to #6 and enter “IN” status code.

## Rationale and Reference(s):

**This plant (also referred to as the Royster Company Money Point Plant) manufactured commercial fertilizer from approximately the mid-1930s until 1973. From 1978 through 1986, waste piles and mixing operations took place with metal constituents such as zinc, chromium, lead, and cadmium. According to the 1986 Facility Management Plan, the only regulated hazardous waste managed by the Royster facility was emission control dust/sludge from the primary production of steel in electric furnaces (K061). The waste was mixed with non-hazardous zinc rich filter cake sludge. The emission control dust/sludge and the zinc rich filter cake sludge were both generated from off-site operations and brought to the Royster site. According to a letter from Royster to USEPA Region III dated March 18, 1986, the mixture was then transferred to Royster’s South Norfolk facility and used as feed stock for the production of commercial fertilizer.**

**In December 1985, Elizabeth River Terminals (ERT) purchased the site from Royster. Kinder Morgan purchased ERT in 2001, and is the current owner of the former Royster site. According to Kinder Morgan, the site buildings were demolished between 1989 and 1993. As of May 1986, Royster no longer received or handled hazardous waste.**

**On November 28, 2006, a RCRA Corrective Action (CA) site visit was conducted and a meeting was held at the former Royster facility site by representatives of the EPA, the Virginia Department of Environmental Quality (VDEQ), the EPA’s contracted consultant, and Kinder Morgan. In addition to the above, the facility’s administrative record was researched and applicable administrative records were summarized and compiled based upon file searches of the DEQ’s Central Office, Office of Hazardous Waste, RCRA files, and the DEQ’s Regional Office files (all media), and the EPA’s RCRA file records.**

**A summary of the salient findings associated with the above meeting, site visit, and file searches of the facility’s administrative record, indicate that current human exposures are under control.**

### **SWMU #1 - Former Mixing Tank**

This open top plate steel tank was used to receive and mix two waste streams; one hazardous and one non-hazardous. The dimensions of this unit were 36 feet, 6 inches by 38 feet, 8 inches; the tank was 46 inches high. The carbon steel plate tank covered the entire front room of the process building. Kinder Morgan indicated that this structure was actually a small processing building, that was lined with metal plates (the floor and all four walls). The 1986 Facility Management Plan also refers to this SWMU as a storage tank.

Operation of this unit reportedly began in December 1985. A letter from Royster to the Virginia Department of Health dated May 1986 indicated that the facility no longer handled hazardous waste. Therefore, it is assumed that the mixing tank was no longer in use by 1986.

Wastes managed included granulated emission control dust from the electric furnaces of a nearby steel production process and a zinc-rich, non-hazardous filter cake sludge from a nearby zinc sulfate production process. The dust had a high zinc content with low concentrations of hexavalent chromium, lead, and cadmium. The waste was mixed with non-hazardous zinc-rich filter cake sludge. Each batch mixing operation could process approximately 100 tons of material per year. This process was conducted three to six times per year. According to a letter from Royster to USEPA Region III dated March 18, 1986, the mixture was then transferred to Royster's South Norfolk facility and used as feedstock for the production of commercial fertilizers.

The tank mixing unit (SWMU No. 1) has been closed in general accordance with the approved Closure Plan for this SWMU. Closure activities included four rounds of sampling and analyses, and three rounds of soil excavation and removal. In addition to the excavation of contaminated soil, the building housing the tank mixing facility and the foundation were also demolished and removed. These actions have mitigated any environmental impacts from historic operations and have resulted in the Facility posing no unacceptable risk to human health and the environment.

### **SWMU #2 - Former Waste Piles A and B**

According to a July 1986 Facility Management Plan, two indoor storage waste piles (A and B) were in use at the site. Waste Pile A operated from 1978 to September 1984. It was located inside a warehouse building, which was destroyed during a windstorm in September 1984. The warehouse structure was 150 feet by 250 feet in size. Approximately 5,000 tons of material were mixed here during this unit's operational period according to a March 18, 1986 letter from Royster to USEPA Region III. Waste Pile B replaced Waste Pile A and was operated in a warehouse structure adjacent to Waste Pile A. Dimensions of this building were 100 feet by 50 feet. It operated from September 1984 and was used until SWMU #1 was constructed in this building in December 1985. It appears that SWMU #1 replaced SWMU #2. Wastes managed included granulated emission control dust from the electric furnaces of a nearby steel production process and a zinc-rich, non-hazardous filter cake sludge from a nearby zinc sulfate production process.

In this case, the waste pile unit (SWMU No. 2) at the Royster property underwent closure activities that included five rounds of sampling and analyses, and three rounds of soil excavation and removal. The foundation of the building that formerly housed the waste pile facility was demolished and also removed prior to closure.

The distribution of residual contaminants in soils (post remedial action) at the SWMUs is such that there is insufficient mass of contamination in any one area to remain a concern for potential leaching to groundwater. In December 1988, the facility was inspected by a representative from the Virginia Department of Waste Management. Based on the December 1988 site visit, the Virginia Department of Waste Management determined that the company had completed a clean closure at the Facility. EPA Region III agrees with this determination.

Various Virginia State Offices and the USEPA provided oversight for activities at the former Royster property during the operating years of the facility through facility close out. The Virginia Department of Waste Management was the lead agency during the closure of the facility. The agency worked with the property owners through three

rounds of contaminated soil excavation and removal, and confirmation analyses before approving the closure of the facility in June 1989.

Additional soil samples were collected in 2006 through the Elizabeth River Project as part of the wetland restoration effort at the site.

Based on the sampling results under RCRA Closure of the SWMU No. 1 and 2 and the more recent facility soil sampling, the (VDEQ) and the USEPA agree that Corrective Action is Complete at the facility provided that future use of the property will be restricted to industrial use and/or wetlands revitalization.

References:

Final RCRA Site Visit Report for the Former Royster Company Facility.  
Prepared by Tetra Tech EC, Inc., March 2007.

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 appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

**Summary Exposure Pathway Evaluation Table**

Potential **Human Receptors** (Under Current Conditions)

<b><u>“Contaminated” Media</u></b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media, which are not “contaminated” as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“\_\_\_”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

Rationale and Reference(s):

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

- If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”
- If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”
- If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?
- If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
  - If no - (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.
  - If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), 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, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Former Royster facility, EPA ID # VAD 003 178 126, located at Money Point, Pratt Street in Chesapeake, Virginia under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

Completed by *Bill Wentworth*  
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Date 12/17/08

Supervisor *[Signature]*  
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Date 12/22/08

Locations where References may be found:

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