

# ADEM



## ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 36130-1463 ♦ 1400 COLISEUM BLVD. 36110-2059

MONTGOMERY, ALABAMA

WWW.ADEM.STATE.AL.US

(334) 271-7700

**JAMES W. WARR**  
DIRECTOR

**DON SIEGELMAN**  
GOVERNOR

September 10, 2001

Mr. Ben Noble  
Senior Geologist  
U. S. Pipe & Foundry Company  
P. O. Box 10406  
Birmingham, Alabama 35202

Facsimiles: (334)  
Administration: 271-7950  
General Counsel: 394-4332  
Air: 279-3044  
Land: 279-3050  
Water: 279-3051  
Groundwater: 270-5631  
Field Operations: 272-8131  
Laboratory: 277-6718  
Mining: 394-4326  
Education/Outreach: 394-4383

RE: Environmental Indicator Evaluations  
U. S. Pipe and Foundry Bessemer Plant  
2023 St. Louis Avenue, Bessemer Alabama  
USEPA Identification Number: ALD 004 017 869

Dear Mr. Noble:

The Alabama Department of Environmental Management (ADEM) has recently completed a qualitative evaluation of the environmental conditions at U. S. Pipe and Foundry Bessemer Plant, and ADEM is pleased to provide you with a copy of the evaluation for your information.

While implementing the permitting requirements of the Alabama Hazardous Waste Management and Minimization Act (AHWMMA) and the Resource Conservation and Recovery Act (RCRA), as amended by the 1984 Hazardous and Solid Waste Amendments (HSWA), at U. S. Pipe and Foundry Bessemer Plant, ADEM is always cognizant of its role in protecting human health and limiting further migration of groundwater contamination. As such, the enclosed evaluation covers two specific concerns environmental contamination raises to the facility and local community:

- 1) Plausible human exposure to soil, groundwater, air and surface water contamination at or from the facility, and;
- 2) The continuing migration of contaminated groundwater, both on and offsite.

Please note that the purpose of the environmental indicator evaluation is solely to evaluate the status of the two environmental indicators discussed, and that it does not reduce or limit in any way the facility's obligation to perform any monitoring, maintenance, investigation, remediation, or other activity required pursuant to any applicable regulations, permits, or orders.

The enclosed environmental indicator evaluation should not be viewed as somehow separate and distinct from the corrective action process ongoing at U. S. Pipe and Foundry Bessemer Plant. Rather, it is an evaluation of current environmental conditions and a focusing of efforts on potential concerns that ADEM, the facility and interested members of the public must work toward satisfying through implementation of the corrective action process at U. S. Pipe and Foundry Bessemer Plant.

Birmingham Branch  
110 Vulcan Road  
Birmingham, Alabama 35209-4702  
(205) 942-6168  
(205) 941-1603 (Fax)

Decatur Branch  
2715 Sandlin Road, S.W.  
Decatur, Alabama 35603-1333  
(256) 353-1713  
(256) 340-9359 (Fax)

Mobile Branch  
2204 Perimeter Road  
Mobile, Alabama 36615-1131  
(334) 450-3400  
(334) 479-2593 (Fax)

Mobile - Coastal  
4171 Commanders Drive  
Mobile, Alabama 36615-1421  
(334) 432-6533  
(334) 432-6598 (Fax)



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Mr. Ben Noble  
September 10, 2001  
Page 2


Therefore, every evaluation should conclude with a projection or outline of future actions to move the facility toward the point where human exposures and/or groundwater releases are controlled. It should be understood that the evaluations operate at the "facility level." In other words, **every area** at the facility must meet the control definition before human exposures or groundwater releases can be considered controlled.

Because many different corrective action documents frequently exist at a facility, ADEM has tried to select the most pertinent documents from which to make its evaluation. The utilized source documents (titles and dates) are explicitly referenced in the evaluation to provide clarity and reproducibility. ADEM recognizes that the potential exists for current conditions at the facility to be somewhat different to that represented in the evaluation. Such discrepancies can be administratively managed during implementation of the ongoing corrective action process and subsequent reevaluations.

In summary, the evaluation represents a "snap-shot" of the facility's environmental conditions at a particular point in time, and it is a dynamic document subject to revision. Because of the evaluation's focus on current environmental conditions, ADEM views the evaluation as an excellent resource for members of the public as well as the facility. ADEM hopes you find the evaluation useful and informative.

If questions or comments arise regarding this evaluation, please contact Mr. Keith West of my staff at (334) 271-7748.

Sincerely,



Stephen A. Cobb, Chief  
Hazardous Waste Branch  
Land Division

SAC/KNW/sep:L:U.S. Pipe Bessemer EI Cover Letter (8-22-01)

Enclosure: Environmental Indicator Memo

cc: Clothes Stallworth, ADEM  
Doug McCurry, USEPA Region 4

File:



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**JAMES W. WARR**  
DIRECTOR

**DON SIEGELMAN**  
GOVERNOR

September 10, 2001

### MEMORANDUM

TO: Stephen A. Cobb, Chief *AC*  
Hazardous Waste Branch  
Land Division

THRU: Vernon H. Crockett, Chief *VHC*  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division *9/10/2001*

FROM: Keith West *KW by VHC*  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

SUBJ: Evaluation of U. S. Pipe and Foundry Company Bessemer status under the RCRAInfo  
Corrective Action Environmental Indicator Event Codes (CA725 and CA750)  
EPA I.D. Number: ALD 004 017 869

Facsimiles: (334)  
Administration: 271-7950  
General Counsel: 394-4332  
Air: 279-3044  
Land: 279-3050  
Water: 279-3051  
Groundwater: 270-5631  
Field Operations: 272-8131  
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Mining: 394-4326  
Education/Outreach: 394-4383

### I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of U. S. Pipe and Foundry Company Bessemer status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Act RCRAInfo database:

- 1) Current Human Exposures Under Control (CA725),
- 1) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the Hazardous Waste Branch Chief is required prior to entering these event codes into RCRAInfo. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate location within Attachments 1 and 2.

### II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the second evaluation for U. S. Pipe and Foundry Company Bessemer.



### III. FACILITY SUMMARY

The Bessemer Pipe Plant is a ductile iron foundry involved in the casting and sale of water piping and associated materials. The facility employs approximately 475 people and has been in operation at this location for approximately 107 years. The facility consists of the foundry proper, several pipe storage yards for the finished product, several settling ponds (These ponds are primarily used to settle cement lining water and casting machine cooling waters.), scrap raw material storage, and a facility landfill formerly used for disposition of solid foundry waste. Prior to 1974, general foundry wastes were placed in the Old Landfill (SWMU 21). Wastes managed in this unit were likely to include cupola slag, cement-lining operation waste, sediment from the wastewater treatment system, and waste core sands. The estimated volume of the landfill is approximately 76,000 cubic yards or 91,200 tons. Foundry waste that is generated at the facility is presently disposed of off-site at an approved solid waste disposal facility.

The Bessemer Pipe Plant uses a cupola in its melting operation to produce ductile iron. A variety of scrap is used in the process. This raw material is closely screened to minimize levels of unwanted metal contaminants. Melting operations occur for 8-10 hours per day, five days per week for an average of 240-250 days of operation per year. Approximately 15 tons of fine particulate material, termed cupola "baghouse dust", are generated per day of melting operation. Despite close screening of scrap raw material, limited contamination from heavy metals (Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, and Zinc) can be found in the baghouse dust.

Prior to 1987, the practice at the Bessemer Plant landfill was to mix the untreated baghouse dust with the general foundry waste materials on a daily basis as they were produced. The materials were placed in the landfill with heavy equipment. Since 1987, the baghouse dust has been treated (stabilized) with the proprietary Solifix™ process which renders the dust nonhazardous, and has been disposed of off-site.

The Bessemer Pipe Plant is located in a heavily industrialized area of Jefferson County, Alabama on the northern edge of the Bessemer City limits. Specifically, the facility lies in the northern half (1/2) of Section 5, Township 19 South, Range 4 West (Bessemer Quadrangle) of the Huntsville, Alabama Meridian Survey.

The Cupola baghouse dust sometimes contains lead and cadmium in concentrations exceeding the maximum EP Toxicity or TCLP levels. When this occurs, the dust is classified under ADEM and EPA as hazardous waste numbers D006 and D008. In 1998 U. S. Pipe and Foundry Bessemer was issued a Post-Closure Permit for the closed on-site landfill which contains lead (D006) and cadmium (D008). Following the issuance of the Permit U. S. Pipe and Foundry Bessemer submitted a Confirmatory Sampling Work Plan and a RCRA Facility Investigation Work Plan in accordance with schedule of compliance in Appendix D. After approval of the Confirmatory Sampling Report and RCRA Facility Investigation Report the Department imposed a Corrective Measures Study for SWMU's 8 and 22. The Corrective Measures Study is still ongoing.

#### **IV. CONCLUSION FOR CA725**

At this time U. S. Pipe and Foundry Company Bessemer has detected benzene, arsenic, and lead, in concentrations that exceed the relevant Groundwater Protection Standards required by its Post-Closure Permit. In addition, some of the background soil samples collected had concentrations of arsenic (ranged from 2.20 ppm to 87.1 ppm), collected from sixteen test pits/borings excavated along the south and southwest boundaries of the facility, which appear to be elevated, based on the Department's experience with other facilities in the Birmingham, Jefferson County area.

However, a site-specific screening level risk assessment, included as an attachment to the Phase I RCRA Facility Investigation Report dated March 18, 1999 and revised September 6, 1999, indicates that no unacceptable risks are present due to the contaminants on-site.

From the information contained in the screening level risk assessment the arsenic concentrations in the soil do not pose an unacceptable risk to human health or the environment at this time and warrant a CA725 yes.

#### **V. CONCLUSION FOR CA750**

At this time U. S. Pipe and Foundry Company Bessemer has detected benzene, arsenic, and lead, in concentrations that exceed the relevant Groundwater Protection Standards required by its Post-Closure Permit.

However, potentiometric data collected during routine groundwater monitoring events consistently indicate that both the shallow and deeper flow zones that are subject to semi-annual monitoring discharge into Valley Creek, which is not used for drinking water purposes. It should be noted that the concentration levels of the constituents-of-concern only slightly exceed the drinking water MCLs prior to discharge and subsequent dilution by the receiving water (Valley Creek). Arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non detect to 0.014 ppm, and lead ranged from non detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

The groundwater data collected to this point in time does not indicate that the groundwater poses an unacceptable risk to human health and the environment and warrants a CA750 yes.

#### **VI. SUMMARY OF FOLLOW-UP ACTIONS**

In accordance with the Post-Closure Care Permit, groundwater monitoring will continue at the subject facility. Specifically the groundwater monitoring program includes, but is not limited to, the collection of analytical and potentiometric data that will be utilized to document and verify that the groundwater discharge to Valley Creek does not pose a threat to human health or the environment.

- Attachments:
1. CA725: Current Human Exposures Under Control
  2. CA750: Migration of Contaminated Groundwater Under Control

**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES 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 RISK.**

ATTACHMENT 1  
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION  
RCRA Corrective Action  
Environmental Indicator (EI) RCRAInfo Code (CA725)  
Current Human Exposures Under Control

Facility Name: U. S. Pipe and Foundry Company Bessemer  
Facility Address: 2023 St. Louis Avenue Bessemer, Alabama  
Facility EPA ID #: ALD 004 017 869

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 RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRA Info Event Code (CA725)**

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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Benzene, arsenic, and lead have been detected in the Groundwater above the groundwater protection standard.
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)	X			Arsenic has been detected in the Soil above background levels.
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			Arsenic has been detected in the Soil above background levels.
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.

  **X**   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):** U. S. Pipe and Foundry Company Bessemer has detected benzene, arsenic, and lead, in concentrations that exceed the relevant Groundwater Protection Standards required by its Post-Closure Permit. In addition, some of the background soil samples collected had concentrations of arsenic (ranged from 2.20 ppm to 87.1 ppm), collected from sixteen test pits/borings excavated along the south and southwest boundaries of the facility, which appear to be elevated, based on the Department's experience with other facilities in the Birmingham, Jefferson County area.

<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.



In addition, potentiometric data collected during routine groundwater monitoring events consistently indicate that both the shallow and deeper flow zones that are subject to semi-annual monitoring discharge into Valley Creek, which is not used for drinking water purposes. It should be noted that the concentration levels of the constituents-of-concern only slightly exceed the drinking water MCLs prior to discharge and subsequent dilution by the receiving water (Valley Creek). Arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non detect to 0.014 ppm, and lead ranged from non detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

Groundwater Demonstration Workplan dated March 15, 1999,  
Phase I RCRA Facility Investigation Report dated March 18, 1999 revised September 6, 1999.  
Confirmatory Sampling Report dated January 12, 1999 revised May 19, 1999.  
Groundwater Monitoring Notice of Exceedence dated August 25, 1999.  
1999 Annual Groundwater Monitoring Report dated September 27, 1999.  
Groundwater Demonstration Workplan Addendum dated November 24, 1999.  
2000 Annual Groundwater Monitoring Report dated September 29, 2000.

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?

<b>Summary Exposure Pathway Evaluation Table</b>							
<b>Potential Human Receptors (Under Current Conditions)</b>							
<b>“Contaminated” Media</b>	<b>Residents</b>	<b>Workers</b>	<b>Day-Care</b>	<b>Construction</b>	<b>Trespassers</b>	<b>Recreation</b>	<b>Food<sup>3</sup></b>
<u>Groundwater</u>	No	No	No	Yes	No	No	No
<u>Air (indoors)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Soil (surface, e.g., &lt;2 ft)</u>	No	Yes	No	Yes	No	No	No
<u>Surface Water</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Sediment</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Soil (subsurface, e.g., &gt;2 ft)</u>	No	No	No	Yes	No	No	No
<u>Air (outdoors)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not “contaminated” as identified in #2, please strike-out specific Media, including Human Receptors’ spaces, or enter “N/C” for not contaminated.
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 assigned spaces in the above table. 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).

X 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

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

Rationale and Reference(s): Workers and construction workers at U. S. Pipe and Foundry Bessemer could be exposed to contaminated soil and groundwater at the site if their job involves digging into the surface and subsurface soil. Arsenic has been detected in soil as high as 87 ppm and lead at 6400 ppm. In the groundwater arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non-detect to 0.014 ppm, and lead ranged from non-detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

In addition, a site-specific screening level risk assessment, included as an attachment to the Phase I RCRA Facility Investigation Report dated March 18, 1999 and revised September 6, 1999, indicates that no unacceptable risks are present due to the contaminants on-site.

Groundwater Demonstration Workplan dated March 15, 1999,  
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1999 Annual Groundwater Monitoring Report dated September 27, 1999.  
Groundwater Demonstration Workplan Addendum dated November 24, 1999.  
2000 Annual Groundwater Monitoring Report dated September 29, 2000.

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)?

X 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): Workers and construction workers at U. S. Pipe and Foundry Bessemer could be exposed to contaminated soil and groundwater at the site if their job involves digging into the surface and subsurface soil. Arsenic has been detected in soil as high as 87 ppm and lead at 6400 ppm. In the groundwater arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non-detect to 0.014 ppm, and lead ranged from non-detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

In addition, a site-specific screening level risk assessment, included as an attachment to the Phase I RCRA Facility Investigation Report dated March 18, 1999 and revised September 6, 1999, indicates that no unacceptable risks are present due to the contaminants on-site.

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):

<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.

6. Check the appropriate RCRAInfo 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 (and 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 U. S. Pipe and Foundry Company Bessemer facility, EPA ID # ALD 004017869, located at 2023 St. Louis Avenue Bessemer, Alabama 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: KW x NCS Date September 10, 2001

Keith West  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

Supervisor: Vernon H. Crockett Date September 10, 2001

Vernon H. Crockett, Chief  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

Supervisor: Stephen A. Cobb Date September 10, 2001

Stephen A. Cobb, Chief  
Hazardous Waste Branch  
Land Division

Locations where References may be found:

Alabama Department of Environmental Management  
1400 Coliseum Boulevard  
Montgomery, Alabama 36110

U.S. EPA Region 4  
61 Forsythe Street  
Atlanta Federal Center  
Atlanta, Georgia 30303

U. S. Pipe and Foundry Company  
Bessemer Pipe Plant  
2023 St. Louis Avenue  
Bessemer, Alabama 35020

Contact telephone and e-mail numbers

Keith West  
Alabama Department of Environmental Management  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division  
334-271-7748  
[knw@adem.state.al.us](mailto:knw@adem.state.al.us)

Mr. Ben Noble  
Senior Geologist  
US Pipe & Foundry Company  
PO Box 10406  
Birmingham, Alabama 35202  
205-254-7434

**ATTACHMENT 2**  
**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**  
**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRAInfo Event Code (CA750)**  
**Migration of Contaminated Groundwater Under Control**

**Facility Name:** U. S. Pipe and Foundry Company Bessemer  
**Facility Address:** 2023 St. Louis Avenue, Bessemer Alabama  
**Facility EPA ID #:** ALD 004 017 869

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 RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

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): At this time U. S. Pipe and Foundry Company Bessemer has detected benzene, arsenic, and lead, in concentrations that exceed the relevant Groundwater Protection Standards required by its Post-Closure Permit.

However, potentiometric data collected during routine groundwater monitoring events consistently indicate that both the shallow and deeper flow zones that are subject to semi-annual monitoring discharge into Valley Creek, which is not used for drinking water purposes. It should be noted that the concentration levels of the constituents-of-concern only slightly exceed the drinking water MCLs prior to discharge and subsequent dilution by the receiving water (Valley Creek). Arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non detect to 0.014 ppm, and lead ranged from non detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

Groundwater Demonstration Workplan dated March 15, 1999,  
Phase I RCRA Facility Investigation Report dated March 18, 1999 revised September 6, 1999.  
Confirmatory Sampling Report dated January 12, 1999 revised May 19, 1999.  
Groundwater Monitoring Notice of Exceedence dated August 25, 1999.  
1999 Annual Groundwater Monitoring Report dated September 27, 1999.  
Groundwater Demonstration Workplan Addendum dated November 24, 1999.  
2000 Annual Groundwater Monitoring Report dated September 29, 2000.

<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).

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?

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.

Rationale and Reference(s): Potentiometric data collected during routine groundwater monitoring events consistently indicate that both the shallow and deeper flow zones that are subject to semi-annual monitoring discharge into Valley Creek, which is not used for drinking water purposes. It should be noted that the concentration levels of the constituents-of-concern only slightly exceed the drinking water MCLs prior to discharge and subsequent dilution by the receiving water (Valley Creek). Arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non detect to 0.014 ppm, and lead ranged from non detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

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<sup>2</sup>"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.



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): Potentiometric data collected during routine groundwater monitoring events consistently indicate that both the shallow and deeper flow zones that are subject to semi-annual monitoring discharge into Valley Creek, which is not used for drinking water purposes. It should be noted that the concentration levels of the constituents-of-concern only slightly exceed the drinking water MCLs prior to discharge and subsequent dilution by the receiving water (Valley Creek). Arsenic ranged from 0.0110 ppm to 0.0690 ppm, benzene ranged from non-detect to 0.014 ppm, and lead ranged from non detect to 0.0190 ppm. Further, concentration versus time plots do not indicate any increasing trends of the constituents-of-concern in groundwater.

Groundwater Demonstration Workplan dated March 15, 1999,

Phase I RCRA Facility Investigation Report dated March 18, 1999 revised September 6, 1999.

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Groundwater Demonstration Workplan Addendum dated November 24, 1999.

2000 Annual Groundwater Monitoring Report dated September 29, 2000.

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)?

  X   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) providing 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," providing 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 identifying if there is evidence that the amount of discharging contaminants is increasing.

       If unknown - enter "IN" status code in #8.

Rationale and Reference(s): The following information summarizes the maximum concentrations detected for the constituents of concern from the most current sampling data: benzene 0.0100 mg/l, arsenic 0.0530 mg/l, lead less than the Groundwater Protection Standard of 0.005 mg/L for benzene, .05 mg/L arsenic, and lead at 0.015 µg/L

Based on the data and information presented in the references listed below, the following observations can be summarized:

- There is no evidence of increasing concentrations of the constituents of concern with time.
- The discharge of these constituents of concern, at the concentrations indicated above, into Valley Creek is not anticipated to have unacceptable impacts.

Phase I RCRA Facility Investigation Report dated March 18, 1999 revised September 6, 1999.

1999 Annual Groundwater Monitoring Report dated September 27, 1999.

2000 Annual Groundwater Monitoring Report dated September 29, 2000.

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

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>)?

\_\_\_\_\_ 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): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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<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.

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): In accordance with the Post-Closure Care Permit, groundwater monitoring will continue at the subject facility. Specifically the groundwater monitoring program includes, but is not limited to, the collection of analytical and potentiometric data that will be utilized to document and verify that the groundwater discharge to Valley Creek does not pose a threat to human health or the environment.

AHWMMA Post-Closure Care Permit, ALD 004 017 869, issued March 31, 1998.  
2000 Annual Groundwater Monitoring Report dated September 29, 2000.

8. Check the appropriate RCRA Info 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 U. S. Pipe and Foundry Company Bessemer facility, EPA ID # ALD 004 017 869, located at 2023 St. Louis Avenue Bessemer, Alabama. 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: KW, VCC Date September 10, 2001

Keith West  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

Supervisor: Vernon H. Crockett Date September 10, 2001

Vernon H. Crockett, Chief  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

Supervisor: Stephen A. Cobb Date September 10, 2001

Stephen A. Cobb, Chief  
Hazardous Waste Branch  
Land Division

Locations where References may be found:

Alabama Department of Environmental Management  
1400 Coliseum Boulevard  
Montgomery, Alabama 36110

U.S. EPA Region 4  
61 Forsythe Street  
Atlanta Federal Center  
Atlanta, Georgia 30303

U. S. Pipe and Foundry Company  
Bessemer Pipe Plant  
2023 St. Louis Avenue  
Bessemer, Alabama 35020

Contact telephone and e-mail numbers

Keith West  
Alabama Department of Environmental Management  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division  
334-271-7748  
[knw@adem.state.al.us](mailto:knw@adem.state.al.us)

Mr. Ben Noble  
Senior Geologist  
US Pipe & Foundry Company  
PO Box 10406  
Birmingham, Alabama 35202  
205-254-7434



## ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 ♦ 1400 COLISEUM BLVD. 36110-2059

MONTGOMERY, ALABAMA 36130-1463

WWW.ADEM.STATE.AL.US

(334) 271-7700

JAMES W. WARR  
DIRECTOR

September 7, 1999

DON SIEGELMAN  
GOVERNOR

### MEMORANDUM

TO: Stephen A. Cobb, Chief *SA*  
Hazardous Waste Branch  
Land Division

FROM: Keith West *KW*  
Industrial Facilities Section  
Hazardous Waste Branch  
Land Division

SUBJ: Evaluation of U. S. Pipe and Foundry Company Bessemer status under the RCRIS  
Corrective Action Environmental Indicator Event Codes (CA725 and CA750)  
EPA I.D. Number: ALD 004 017 869

Facsimiles: (334)  
Administration: 271-7950  
Air: 279-3044  
Land: 279-3050  
Water: 279-3051  
Groundwater: 270-5631  
Field Operations: 272-8131  
Laboratory: 277-6718

### I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of U. S. Pipe and Foundry Company Bessemer status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Information System (RCRIS):

- 1) Current Human Exposures Under Control (CA725),
- 1) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the Hazardous Waste Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate location within Attachments 1 and 2.

### II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the first evaluation for U. S. Pipe and Foundry Company Bessemer.

### III. FACILITY SUMMARY

The Bessemer Pipe Plant is a ductile iron foundry involved in the casting and sale of water piping and associated materials. The facility employs approximately 475 people and has been in operation at this location for approximately 105 years. The facility consists of the foundry proper, several pipe storage yards for the finished product, several treatment ponds, scrap raw material storage, and a facility landfill formerly used for disposition of solid foundry waste. The estimated volume of the landfill is approximately 76,000 cubic yards or 91,200 tons. Foundry waste that is generated at the facility is presently disposed of off-site at an approved solid waste disposal facility.



The Bessemer Pipe Plant uses a cupola in its melting operation to produce ductile iron for pipe making. A variety of scrap is used in the process. This raw material is closely screened to minimize levels of unwanted metal contaminants. Melting operations occur for 8-10 hours per day, five days per week for an average of 240-250 days of operation per year. Approximately 15 tons of fine particulate material, termed cupola "baghouse dust", are generated per day of melting operation. Despite close screening of scrap raw material, limited contamination from select heavy metals can be found in the baghouse dust.

Prior to 1987, the practice at the Bessemer Plant landfill was to mix the untreated baghouse dust with the general foundry waste materials on a daily basis as they were produced. The materials were placed on the landfill with heavy equipment. Since 1987, the baghouse dust has been treated (stabilized) with the proprietary Solifix process which renders the dust nonhazardous, and has been disposed of off-site.

The Bessemer Pipe Plant is located in a heavily industrialized area of Jefferson County, Alabama on the northern edge of the Bessemer City limits. Specifically, the facility lies in the northern half (1/2) of Section 5, Township 19 South, Range 4 West (Bessemer Quadrangle) of the Huntsville, Alabama Meridian Survey.

**IV. CONCLUSION FOR CA725**

At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that has exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility, which appear to be elevated, based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

**V. CONCLUSION FOR CA750**

At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that has exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility, which appear to be elevated, based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

**VI. SUMMARY OF FOLLOW-UP ACTIONS**

U. S. Pipe and Foundry Company Bessemer, through the implementation of the Groundwater Demonstration Workplan, intends to demonstrate that a source other than a regulated unit caused the contamination or that the detection is an artifact caused by an error in sampling, analysis, or statistical evaluation or natural variation in the groundwater. The Department has also requested that U. S. Pipe and Foundry Bessemer develop additional background data for Arsenic, which appears to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. Environmental Indicator Evaluations for CA725 and CA750 should be updated for this facility after the ongoing RFI activities are completed, which is anticipated to occur in Fiscal Year 2000.

- Attachments:
1. CA725: Current Human Exposures Under Control
  2. CA750: Migration of Contaminated Groundwater Under Control



**ATTACHMENT I**

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION  
RCRA Corrective Action  
Environmental Indicator (EI) RCRIS Code (CA725)  
Current Human Exposures Under Control**

**Facility Name:** U. S. Pipe and Foundry Company Bessemer  
**Facility Address:** 2023 St. Louis Avenue Bessemer, Alabama  
**Facility EPA ID #:** ALD 004 017 869

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).

**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Benzene, Arsenic, and Lead have been detected in the Groundwater above appropriately protective risk-based levels.
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)	X			Arsenic has been detected in the Soil above appropriately protective risk-based levels.
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			Arsenic has been detected in the Soil above appropriately protective risk-based levels.
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.

  X   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): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the

<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.

**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

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?

<b>Summary Exposure Pathway Evaluation Table</b>							
<b>Potential Human Receptors (Under Current Conditions)</b>							
<b>“Contaminated” Media</b>	<b>Residents</b>	<b>Workers</b>	<b>Day-Care</b>	<b>Construction</b>	<b>Trespassers</b>	<b>Recreation</b>	<b>Food<sup>3</sup></b>
<u>Groundwater</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Air (indoors)</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>
<u>Soil (surface, e.g., &lt;2 ft)</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Surface Water</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>
<u>Sediment</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>
<u>Soil (subsurface, e.g., &gt;2 ft)</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Air (outdoors)</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>	<u>N/C</u>

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not “contaminated” as identified in #2, please strike-out specific Media, including Human Receptors’ spaces, or enter “N/C” for not contaminated.

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 assigned spaces in the above table. 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).

X 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

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

**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

Rationale and Reference(s): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

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."

X 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): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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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).

X 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

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<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.

**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

Rationale and Reference(s): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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**Current Human Exposures Under Control**

**Environmental Indicator (EI) RCRIS Event Code (CA725)**

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 (and 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 U. S. Pipe and Foundry Company Bessemer facility, EPA ID # ALD 004017869, located at 2023 St. Louis Avenue Bessemer, Alabama 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 Keith West Date September 7, 1999  
Keith West  
Environmental Engineer

Supervisor Stephen A. Cobb Date September 7, 1999<sup>5</sup>  
Stephen A. Cobb, Chief  
Hazardous Waste Branch, Land Division

Locations where References may be found:

Groundwater Demonstration Workplan dated March 15, 1999,  
Phase I RCRA Facility Investigation Report dated March 18, 1999.  
Confirmatory Sampling Report dated January 12, 1999 revised May 19, 1999.  
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Contact telephone and e-mail numbers

Keith West  
334-271-7754  
knw@adem.state.al.us

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<sup>5</sup>FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES 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 RISK.



**ATTACHMENT 2**  
**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**  
**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRIS Event Code (CA750)**  
**Migration of Contaminated Groundwater Under Control**

Facility Name: U. S. Pipe and Foundry Company Bessemer  
Facility Address: 2023 St. Louis Avenue, Bessemer Alabama  
Facility EPA ID #: ALD 004 017 869

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).

## RCRA Corrective Action

### Environmental Indicator (EI) RCRIS Event Code (CA750)

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): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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<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).

**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS Event Code (CA750)**

3. Has the migration of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"<sup>24</sup> 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"<sup>6</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.

  X   If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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<sup>24</sup>"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.

**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS Event 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): Rationale and Reference(s): At this time U. S. Pipe and Foundry Company Bessemer has Benzene, Arsenic, Lead, Cyanide, Gross Beta, and Gross Alpha that have exceeded the relevant Groundwater Protection Standard in its Post-Closure Permit. In addition, U. S. Pipe and Foundry Bessemer has background soil concentrations for Arsenic, collected from the four test pits excavated along the southwest boundary of the facility which, appear to be elevated based on the Department's experience with other facilities in the Birmingham, Jefferson County area. The RFI Investigation is still ongoing.

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**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS Event 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 implemented<sup>4</sup>)?

\_\_\_\_\_ 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): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

<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.



**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS Event Code (CA750)**

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 \_\_\_\_\_ facility, EPA ID # \_\_\_\_\_, located at \_\_\_\_\_. 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 Keith West Date September 7, 1999  
Keith West  
Environmental Engineer

Supervisor Stephen A. Cobb Date September 7, 1999  
Stephen A. Cobb, Chief  
Hazardous Waste Branch, Land Division

Locations where References may be found:

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Contact telephone and e-mail numbers

Keith West  
334-271-7754  
knw@adem.state.al.us