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: Pine Bluff Arsenal
Facility Address: 10020 Kabrich Circle Pine Bluff AR
Facility EPA ID #: AR0213820707

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).

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated"[1] 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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	yes			See attachment
Air (indoors)[2]		NO		
Surface Soil (e.g., <2 ft)	yes			
Surface Water	yes			
Sediment	yes			
Subsurf. Soil (e.g., >2 ft)	yes			
Air (outdoors)		NO		

____ 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):
Data was screened against Region III HHMSSL numbers and MCLs.
References include Pine Bluff Arsenal Draft CMS (10-90); Annual groundwater Report and the Interim Measures Data Summary (June 2002)

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] 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.

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)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No			No
Air (indoors)	—	—	—				
Soil (surface, e.g., <2 ft)	No	No	No	yes	yes	No	No
Surface Water	No	No			yes	yes	yes
Sediment	No	No			No	No	No
Soil (subsurface e.g., >2 ft)				yes			No
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).

YE 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):
References see question #2
Risk assessment found DDT in fish at low levels

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

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be

"significant"[4] (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):
See attached memo from PBA.
Contractors wear PPE; fish, surface water + surface soil in posted unfenced areas passed risk assessment (showed no significant risk). There are also SOP's in place, areas are fenced or posted and this is a military installation on Alert.

[4] 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.

5. Can the "significant" exposures (identified in #4) be shown to be within acceptable limits?

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_____ 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):

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 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 Pine Bluff Arsenal facility, EPA ID # AR 0213820704 located at Pine Bluff, AR 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 (signature) Annette Cusher Date 9/29/03
(print) Annette Cusher
(title) Engineer II

Supervisor (signature) Daniel Clanton Date 9/30/03
(print) Daniel Clanton
(title) Engineering Supervisor
(EPA Region or State) State of Arkansas

Locations where References may be found:

ADEQ Central files.

Contact telephone and e-mail numbers

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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.

Pine Bluff Arsenal Maxium Contaminant Levels

Soils COC's	Max mg/kg	SWMU #
Arsenic	1500	22
Barium	4060	65
Mercury	590	22
Chromium	1160	65
Lead	970	22
TCE	0.88	22
PCE	0.11	22
Vinyl Chloride	1.1	22
1,1,2,2-Tetrachloroethane	1.4	22
1,2-Dichloroethene	0.0223	23
Chlorobezene	1700	23
Benzene	240	24
cis-1,2 DCE	2	22
1,1,2-TCA	0.26	22
Benzo(a)anthracene	3	22
Benzo(b)fluoroanthene	6.5	22
DDT	12,000	23
DDD	74	75
Lindane	0.031	24
1,4-Dichlorobenzene	120	24
Carbon tetrachloride	7	24
Alpha BHC	0.077	24
Beta BHC	0.014	24
Methylene Chloride	3.4	24
Hexachlorophene	0.0207	65
Dieldrin	0.146	75
Chloroform	18	23
1,2-dichlorobenzene	40	24
1,2-dichloroethane	5.4	24

Sediment

COC's	Max (µg/g)
DDD	2.095
DDE	0.067
DDT	6.649

Surface Water

COC's	Max (µg/l)
Arsenic	42.49
Barium	601
Cadmium	4.1
Mercury	1.8
Nickel	28.7
Lead	18.3
DDT	7
DDD	7
DDE	7

groundwater

COC's	MAX µg/l	SWMU #
Arsenic	130	60
Mercury	18	27
Chromium	386	62
lead	236	23
Selenium	100	60
Cadmium	23	23
TCE	2620	62
PCE	5080	62
Vinyl Chloride	14	19
1,1,2,2-Tetrachloroethane	3059	22
1,1,2-Trichloroethane	49	19
1,2-Dichloroethene	541	19
Chlorobezene	230,000	24
Benzene	300,000	24
1,1,1-TCA	850	19
Lindane	24	23
1,4-dichlorobenzene	28,000	75
Carbon tetrachloride	590	24
1,2,4-Trichlorobenzene	360	24
Sulfate	2,060	25
Hexachlrorethane	153	62
T Phosphorus	4,470	60
1,1-Dichloroethene	120	22
Trans1,2Dichloroethene	69	62
Bis 2 ethylhexylphalate	42	62
1,1-DCA	9	65
1,1,2,2-TCE	140	19
Chloroform	535	27