

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: Aerojet General Corporation
Facility Address: PO BOX 1036, Camden, AR 71711-1036
Facility EPA ID #: ARD091688283

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program, the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA. The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

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

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”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	Perchlorate is in groundwater
Air (indoors) ²	No	The COC’s are not volatiles
Surface Soil (e.g., <2 ft)	Yes	Perchlorate, HMX, RDX, TPH
Surface Water	Yes	Perchlorate
Sediment	Yes	Perchlorate
Subsurface Soil (e.g., >2ft)	Yes	Perchlorate
Air (outdoors)	No	The COC’s are not volatiles

___ 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):

See Appendix I of the Focused RCRA Facility Investigation Report (RFI), Open Burn Unit and Building 52 Areas, November 1, 2001, Surface Water Interim Measures Quarterly Reports, and the Summary/Progress Semi-annual Report, East Camden, Arkansas, August 17, 2005.

COC Maximum Hits table

Constituent	Media	Maximum	Location
Perchlorate	Soil	2808.70 mg/kg	TTU 4
Perchlorate	Sediment	1244.31 mg/kg	Drainage path of TTU 4
Perchlorate	Groundwater	431 mg/l	PM-2S near B52 SWIM
Perchlorate	Surface water	>0.004 mg/l	Facility wide
Perchlorate	Residential groundwater	0.025 mg/l	Approximately 3 miles from facility boundary
RDX	Groundwater	0.030 mg/l	B22
TPH	Soil	2700 mg/kg	D29

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.

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

Summary Exposure Pathway Evaluation Table

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

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	Yes	No	No	No	No	No	No
Air (indoors)							
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	Yes	No	No
Surface Water	No	Yes	No	Yes	Yes	No	No
Sediment	No	Yes	No	Yes	Yes	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	Yes	No	No	No
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

- Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
- 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).

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.

Rationale and Reference(s):

There are no daycares in or near the facility. Food crops are not grown on the facility, where the contamination is the highest. There are no completed studies demonstrating the levels of perchlorate in water which impacts food crops or animals. There are no COCs to cause any significant air contamination.

See Appendix I of the Focused RCRA Facility Investigation Report, Open Burn Unit and Building 52 Areas, November 1, 2001, Surface Water Interim Measures Quarterly Reports, and the Summary/Progress Semi-annual Report, East Camden, Arkansas, August 17, 2005 and Lab Reports for Samples taken at Locust Bayou.

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

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

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):

To date, the level of contamination in residential groundwater wells is not considered significant. A risk evaluation, using the reference dose demonstrated no risk to children or adult receptors.

On site perchlorate concentrations in surface water are in the process of being remediated. The facility is completing its RFI. The highest levels of contamination are found in the historic open burning area. The facility plans to remediate this area as soon as the new thermal treatment area is built and operational. Although the historic open burning area is still being utilized by the facility (the burning is done in pans), the access is limited to those employees who are responsible for the burn events. These employees are only around the unit during the loading of the pans and the unloading of the ash.

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.

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

If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

If no (there are current exposures that can be reasonably expected to be “unacceptable”)-continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

The facility is located in an industrial park. All contaminated soils at the facility are located inside the perimeter fence. The gate of this facility is manned by a guard. This should eliminate the trespasser scenario for soils, surface water, and sediments. Facility personnel must wear protective clothing at all times, similar to level D, including a lab coat. Contractors must also follow the health and safety plan of the facility. Each contractor and visitor must participate in safety training upon entrance to the facility. There is not a day care on or near the facility. Hunting is not allowed within the facility, nor are food crops grown on the facility.

The contaminated groundwater on the facility is not utilized by the facility and a risk evaluation has shown that the levels of perchlorate in residential groundwater should not impact the health of the adults and children drinking the water.

The surface water is seasonally impacted by perchlorate. The facility has implemented a surface water interim measure in the affected area of the facility and will implement another surface water interim measure prior to the next rainy season.

See the Part B permit Application, the RFI Workplan, sampling results for Locust Bayou residents, and the SWIM quarterly reports.

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (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 Aerojet General Corporation facility, EPA ID #ARD091688283, located at Camden, Arkansas 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) _____ [Signed] _____ Date 9/22/2005 _____
(print) Annette Cusher _____
(title) Engineer II _____

Supervisor (signature) _____ [Signed] _____ Date 9/22/2005 _____
(print) Daniel Clanton _____
(title) Engineering Supervisor _____
(EPA Region or State) ADEQ _____

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.

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