

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: Avionics Specialties Incorporated
Facility Address: 3367 Earlysville Road Earlysville VA 22936
Facility EPA ID #: VAD 089027759

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)?

| | <u>Yes</u> | <u>No</u> | <u>?</u> | <u>Rationale / Key Contaminants</u> |
|-----------------------------|------------|-----------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Groundwater | X | | | Tetrachloroethene (PCE), Trichloroethene (TCE), 1,1,1-Trichloroethane (1,1,1-TCA), 1,4-Dioxane, 1,1-Dichloroethane (1,1-DCA), 1,1-Dichloroethene (1,1-DCE) |
| Air (indoors) ² | X | | | 1,1,1-TCA, PCE, TCE, 1,1-DCA, 1,1-DCE |
| Surface Soil (e.g., <2 ft) | X | | | Arsenic, Thallium |
| Surface Water | X | | | 1,1,1-TCA, 1,1-DCE, 1,1-DCA, PCE, TCE, 1,4-Dioxane |
| Sediment | X | | | 1,1,1-TCA, 1,1-DCE, PCE, TCE, 1,1-DCA, 1,4-Dioxane |
| Subsurf. Soil (e.g., >2 ft) | X | | | PCE, Arsenic, Thallium |
| 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:

Available data from the Phase 1 RFI work have been compiled and compared to appropriately protective risk-based screening levels and criteria, as described in the RFI Status Report of Phase 1 Activities and Phase 2 Work Plan dated June 10, 2014. This data and risk screening criteria are described in Tables 4 through 15 of the June 2014 RFI Status Report. Additional data generated from the Phase 2 RFI fieldwork is available in the April 30, 2015 RFI Phase 2 Work Plan Amendment 2 submittal (and related data/figures), and the residential well data deliverables provided on July 14, 2015 and August 25, 2015. The primary chemicals of concern are chlorinated volatile organic compounds (VOCs) including tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and 1,4-dioxane.

References:

June 10, 2014 RFI Status Report of Phase 1 Activities and Phase 2 Work Plan
 April 30, 2015 RFI Phase 2 Work Plan Amendment 2 (and related data/figures)
 July 14, 2015 Residential Well Data Deliverable and August 25, 2015 Residential Well Data Deliverable

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)

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

Several exposure pathways are presently judged to be complete based on the current site conditions and the Preliminary Exposure Assessment Conceptual Site Model included as Table 16 in the June 2014 RFI Status Report of Phase 1 Activities and Phase 2 Work Plan. The data indicate potential exposure risk exists for (1) ingestion of and dermal contact with tapwater from groundwater, (2) inhalation of volatiles in tapwater from groundwater during showering, (3) vapor intrusion/inhalation of volatiles in indoor air from shallow groundwater, and (4) incidental ingestion and dermal contact with surface water and sediment.

Additional data for offsite surface water and sediment is contained in the April 30, 2015 RFI Phase 2 Work Plan Amendment 2 (and related data/figures). Residential well data is contained in the July 14, 2015 and August 2015 data deliverables. The site’s current condition as a closed manufacturing operation is expected to continue, and the one

employee who served as caretaker is no longer employed since the plant was shuttered and fenced in August 2015. Offsite groundwater consumption by residents will continue, with the 10 closest homes to the site being addressed via the routine residential well sampling and carbon filter maintenance program that has been in place since 2008.

Site related VOCs have been detected in one residential well located approximately 800 feet northwest of the Facility. This well is part of the routine well sampling and carbon filter maintenance program referenced above. Although carbon filtration can be effective for removal of VOCs, some constituents have been detected in the post treatment (effluent) samples collected at this residence. Bottled water has been and will continue to be provided to this residence as part of the response action required by EPA pursuant to the 2012 Administrative Order entered into with Avionics.

References:

June 10, 2014 RFI Status Report of Phase 1 Activities and Phase 2 Work Plan

April 30, 2015 RFI Phase 2 Work Plan Amendment 2 (and related data/figures)

July 14, 2015 Residential Well Data Deliverable and August 25, 2015 Residential Well Data Deliverable

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 cannot 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:

Exposures from the complete pathways indicated above are not reasonably expected to be significant. The groundwater exposure pathway is complete but reasonably anticipated current exposures by offsite residents have been mitigated by the response action (routine well sampling and carbon filter maintenance program) that has been in place since 2008. The one residence with impacts in the effluent from the carbon filter has been provided with bottled water which is used for consumption and cooking.

The inhalation pathway is complete based on concentrations detected above appropriately protective risk-based levels. However, based on the prior evaluation of the use of impacted tapwater from groundwater in a humidifier in the one residence situated approximately 800 feet northwest of the Facility, we found that estimated risks were not outside of EPA’s acceptable risk range (or potentially unacceptable). EPA also evaluated risks for vapor intrusion and inhalation and dermal exposure while showering, and found that these risks are below acceptable EPA thresholds.

The surface water and sediment pathway is considered to be complete, but we don’t expect the reasonably anticipated exposures to be significant or potentially unacceptable. Based on our evaluation of these exposure pathways, the potential risks associated with typical human exposure in a recreational setting are far below acceptable EPA thresholds.

References:

June 10, 2014 RFI Status Report of Phase 1 Activities and Phase 2 Work Plan
April 30, 2015 RFI Phase 2 Work Plan Amendment 2 (and related data/figures)
July 14, 2015 Residential Well Data Deliverable and August 25, 2015 Residential Well Data Deliverable
December 5, 2014 Email communication (redacted) between EPA and resident
September 3, 2015 Internal EPA Memorandum – Supporting Documentation for HHEI Determination, Avionics Specialties Inc.
September 9, 2015 Internal EPA Memorandum – Walnut Hill Well Analytical Results for 2014-2015 and 2014/2015 Data Validation reports

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):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the (insert facility and EPA ID #), located at (insert address) 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 _____
Donna M. McCartney
USEPA Project Manager

Date: _____

Supervisor _____
Luis A. Pizarro
Associate Director, Office of Remediation
EPA Region III

Date _____

Locations where References may be found:

US EPA Region III
Land and Chemicals Division
1650 Arch Street
Philadelphia, PA 19103

Contact telephone numbers and e-mail

(name) Donna McCartney
(phone #) 215-814-3427
(e-mail) mccartney.donna@epa.gov

(name) _____
(phone #) _____
(e-mail) _____