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:	General Electric Company, Former Appliance Park East facility
Facility Address:	Snowden River Parkway, Columbia MD
Facility EPA ID #:	MDD 046279311

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?

X 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	X			See explanation below (1)
Air (indoors) [2]		X		See explanation below (2)
Surface Soil (e.g., <2 ft)		X		All shallow contam. has been excavated or treated.
Surface Water		X		No contamination found.
Sediment	X			See explanation below (3)
Subsurf. Soil (e.g., >2 ft)	X			See explanation below (4)
Air (outdoors)		X		No releases to outdoor air have been found.

___ 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):

(1) Units 2&7: A groundwater plume of trichloroethylene (TCE) contamination is present above the Maximum Contaminant Level (MCL) of 5 : g/l. The extent of the plume, as well as the pump and treat remediation system currently operating, has been investigated in the *RFI Report for Units 2&7* and the *Interim Corrective Measures Implementation Plan*.

UST No. 9: A groundwater plume of benzene and ethylbenzene is present above their respective MCLs of 5 : g/l and 700 : g/l. Groundwater monitoring data can be found in the Quarterly Progress Reports.

Unit 6: TCE was detected in groundwater at a concentration of 670 : g/l (MCL = 5 : g/l) in temporary piezometer P-1. The plume appears to be small and is located under the former Warehouse building. (see *RFI Report for Unit 6* for more information)

(2) Indoor air samples were taken by GE in the building above the TCE plume at Units 2&7 and the results showed levels below OSHA criteria. Data is presented in the *RFI Report for Units 2&7*.

(3) Sediment samples (from 1992) were taken in a 200 m reach of Dorsey Creek , which receives discharge from the Storm Water Management Pond (SWMP). Results showed: (a) elevated levels of chromium, lead, nickel, silver, bis(2-ethylhexyl)phthalate, and polynuclear aromatic hydrocarbons (PAHs) in comparison to ecological sediment effects screening levels and (b) elevated levels of arsenic,bis(2-ethylhexyl)phthalate, and PAHs above residential human health Risk Based Concentrations (RBCs). Data can be found in *RFI Report for Unit 1, SWMP and Dorsey Creek*.

(4) Soil (> 2 feet) contaminated with TCE above soil screening levels is located in the Units 2&7 area. The extent of contamination and the soil vapor extraction remediation system is discussed in the *RFI Report for Units 2&7* and *Interim Corrective Measures Implementation Plan*.

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)~~							
~~Surface Water~~							
Sediment	Yes	Yes				No	No
Soil (subsurface e.g., >2 ft)				No			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).

_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.

GW: No residential or industrial wells are located in any of the plume areas. There are no day care facilities on site. No construction is anticipated in the contaminated areas.

Sediment: There is a potential human exposure pathway because sediment sampling results (as described in #2 above) are above human health RBCs for arsenic, bis(2-ethylhexyl)phthalate, and several PAHs.

Soil (> 2ft): There is no food being grown/produced in contaminated soil area. No construction is anticipated in the contaminated area.

Rationale and Reference(s):[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)?

_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):

The first portion of the Dorsey Creek tributary (from the Stormwater Management Pond to the culvert entrance) is a very short segment of narrow run/riffle with a mixed substrate of cobble, gravel and both fine-grained and sandy sediments. This is the area in which sediment samples obtained in 1992 had elevated concentrations of inorganics and PAHs. Prior to entering the culvert, the creek tributary flows through a cattail pool with a cobbly substrate that contains little, if any, sediment. This area appears to be fairly dry under normal flow conditions. The culvert itself did not show any indication of sediment accumulation. Directly past the culvert up to approximately the final 1992 sediment sampling location, the creek tributary contains limited sediment depositional areas. Past this short stretch, the substrate is completely a small gravel type, with no depositional areas. Therefore, sediment transport further downstream to the creekbed does not appear to be occurring, since the creekbed is pure gravel.

The source of the sediment contamination in the Dorsey Creek tributary is suspected to have been from the Storm Water Management Pond discharge, due to the similarity of constituents found in both areas. In 1998**,** the SWMP sediments were excavated and the area has been completely regraded to restore the hydraulic capacity of the pond. As a result, it is expected that the source of the previously detected sediment contamination has been removed. Therefore, the 1992 creek tributary sediment results are expected to represent the highest levels from the previous contamination and will not increase. The actual current sediment levels should be lower, resulting in a lower exposure risk. In addition, the residential incidental ingestion RBCs to which the sediment concentrations were compared are based on residential exposure assumptions, such as 30 years of exposure on a daily basis. Any potential human exposure to the tributary sediments would be far less. (Sampling data can be found in the *RFI Report for RFI Unit 1, Storm Water Management Pond and Dorsey Creek Sediments* dated 10/31/1996)

The portion of the Dorsey Creek tributary that had elevated sediment sampling results is a short segment of less than a meter width that is extremely difficult to access due to the steep terrain and thick, low vegetation on

the slopes. This fact also decreases the exposure risk.

(continued:)

Residents: Due to the access difficulties described above, the potential for residential exposure to this segment of tributary sediments is minimal. The short segment which was previously contaminated is between the Stormwater Management Pond and the culvert in a developed area. Past the culvert, the uncontaminated portion of the tributary winds through an attractive woodlot and would be a preferred area for children to play or adults to walk. This area is far more attractive than the short, previously contaminated segment. The limited size of the previously contaminated segment also limits the amount of exposure.

Workers: Any possible exposure to workers might include extremely sporadic maintenance or inspection activities. No direct contact to the potentially contaminated sediment is anticipated through this pathway.

[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?

____ 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):

X 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 General Electric Company Former Appliance Park East facility, EPA ID # MDD 046279311, located at Columbia, Maryland 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)		Date 2/4/00
	(print)	Jennifer L. Shoemaker	
	(title)	Remedial Project Manager	

Supervisor	(signature)		Date 2/25/00
	(print)	Robert E. Greaves	
	(title)	Chief, RCRA General Oper. Branch	
	(EPA Region or State)	EPA Region III	

Locations where References may be found:

U.S. EPA Region III
Waste and Chemicals Management Division
RCRA General Operations Branch, 11th Floor
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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.