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RCRA RECORDS CENTER
FACILITY Rogers Corporation
I.D. NO. CTD001141167
FILE LOC. R-13
OTHER 106707

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: Rogers Corporation
Facility Address: One Technology Drive, Killingly CT 06263
Facility EPA ID #: CTD001141167

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	X			**VOCs, CTETPH, SVOCs and metal concentrations exceed levels**
Air (indoors)[2]		X		**Indoor air concentrations do not exceed levels**
Surface Soil (e.g., <2 ft)	X			**PAH concentrations exceed levels**
Surface Water		X		**Surface water concentrations do not exceed levels**
Sediment	X			**As, Cu, Zn, PAHs exceed levels**
Subsurf. Soil (e.g., >2 ft)	X			**ETPH exceeds levels**
Air (outdoors)			X	**No known releases, impacts not anticipated**

____ 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): **August 4, 2003 Site Stabilization Sampling Event**

Groundwater: The Rogers Corporation Killingly Facility is located adjacent to the Quinebaug River at One Technology Drive in Killingly, Connecticut (Figure 1). Fuss & O'Neill conducted one round of groundwater sampling at the site from nine monitoring wells and one supply well on August 4, 2003 (Figure 2). Groundwater samples were analyzed for VOCs (Method 8260), PP13 metals, and SVOCs (Method 8270). The on-site supply well installed in the unconsolidated deposits aquifer was also sampled for VOCs. Metals, VOCs and SVOCs were detected in several of the wells at the site (Table 1).

Metals
MW-02 located downgradient of the Research and Development Building (PAOC-14A) had the highest concentration of metals (Cr, Pb, Ni, and Zn). Metals (As, Cr, Cu, Pb, Ni, and Zn) were also detected in the sample collected from well MW-04 located downgradient of a building that was historically used by Rogers for research and development activities (PAOC-14B).

VOCs
The groundwater samples collected from wells MW-06 and MW-09 located downgradient of a former metal plating lagoon (PAOC-01B), the hazardous waste storage building (PAOC-08), and a former drum storage area (PAOC-23) contained concentrations of PCE and TCE. These constituents were the only VOCs detected in groundwater at the site.

SVOCs
SVOCs were detected in the groundwater sample collected from well MW-04 located downgradient of PAOC-14B. Please note that the results for samples analyzed by

method 8270 were evaluated and qualified accordingly down to the groundwater protection criteria, utilizing detection limits generated by the method MDL studies.

Fate and Transport
Migration of contaminated groundwater in the unconsolidated-deposit aquifer is the dominant contaminant transport mechanism at the site. Groundwater in the unconsolidated-deposit aquifer flows to the southeast toward the Quinebaug River and discharges to the river. Groundwater in the shallow bedrock aquifer likely flows down valley to the southeast toward the river and likely discharges to the river. The depth to bedrock at the site is approximately 40 feet below the ground surface. Therefore, the Quinebaug River is likely the receptor for the majority of the contaminant mass that is mobile and migrating with the site groundwater.

Exceedances
Table 2 lists contaminants above applicable groundwater criteria and locations of exceedances based on one round of groundwater sampling that occurred August 2003. There were several exceedances of the Connecticut Remediation Standard Regulation (RSR) Surface Water Protection Criteria (SWPC) and Groundwater Protection Criteria (GWPC) for metals, PCE, TCE and PAHs.

Air (indoors): Indoor air concentrations in samples collected at thirteen interior locations do not exceed the OSHA PEL eight-hour TWAs (Table 3).

Surface Soil: Surface soil samples were collected at several areas of the site and analyzed for PP13 metals, VOCs, SVOCs, or extractable total petroleum (CTETPH). Table 4 lists detected parameters and exceedances of the applicable Connecticut Direct Exposure Criteria (DEC) for surface soil. The industrial commercial (I/C) DEC are used as the criteria because the samples were collected inside the facility fence and are not within a residential area.

Exceedances of the I/C DEC for PAHs (benzo(a)pyrene, benzo(a)anthracene, and benzo(b)flouranthene) occurred in shallow soil samples collected from the former drum storage area (PAOC-23), the former coal gasification plant (PAOC-24), and the former R&D lagoon (PAOC-1A). These constituents are commonly detected in soil samples that contain asphalt. PAOC-23 and PAOC-24 are located in paved areas that are in poor condition. PAOC-01A is located in an area that likely receives stormwater runoff containing asphalt debris during spring rain events.

Surface Water: Four surface water samples were analyzed for VOCs. VOCs were not detected in any of the samples submitted for laboratory analysis.

Sediment: Six sediment samples were analyzed for PP13 metals, VOCs, and SVOCs. A summary of detected analytical results is presented in Table 5. For evaluating the potential risk from contaminated sediment, the conservative screening-level performance standards were the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs) and the RSR residential (RES) DEC. SQuiRT exceedances occurred for anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, arsenic, copper, and zinc. Res DEC exceedances occurred for benzo(a)anthracene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene.

Subsurface Soil: The only known release to subsurface soil is a #6 petroleum release from an abandoned 30,000 gallon fuel oil tank (PAOC-05). As shown in Table 4, a sample collected from a depth of 11 feet during installation of well MW-03 had a concentration of ETPH that exceeded the I/C DEC.

Air (outdoors): There have been no known releases to outdoor air, and outdoor air impacts from facility operations are not anticipated.

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	Yes	No	No			No
~~Air (indoors)~~	___	___	___				
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	No	No	No
~~Surface Water~~	___	___			___	___	___
Sediment	No	Yes			No	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).

__✓__ 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): See following page

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

Rationale and Reference(s):

Residents via "contaminated":
-*Groundwater* = No complete pathway. There are no residential or public supply wells located downgradient of the impacted groundwater at the site.
-*Soil (surface)* = No complete pathway. The only surface soil contamination is on-site, and no residences are on site.
-*Soil (subsurface)* = No complete pathway. The only subsurface soil contamination is on-site, and no residences are on site.

-*Sediment* = No complete pathway. The facility is fenced on three sides preventing off-site access. The fourth side is adjacent to the Quinebaug River. A dam in the river upstream of the facility prevents boat access to the site. Downstream of the site, there are no public boat launches and overland access to the river is difficult due to steep river bank slopes. The area across the river from the site is undeveloped and heavily wooded. There are no residences within 1,000 feet of the site.

Workers via "contaminated":
-*Groundwater* = Yes, a pathway for human exposure to groundwater contaminated above levels of concern currently exists for Rogers Corporation employees. Water used for facility processes and sanitary purposes is supplied by an on-site supply well drilled in the unconsolidated deposits.
-*Soil (surface)* = Yes, a pathway for human exposure exists to surface soil above levels of concern. Surface soil exceeding the I/C DEC for PAHs occurred at PAOCs that are accessible to employees.
-*Soil (subsurface)* = No complete pathway. Subsurface soil contamination for ETPH was encountered at PAOC-05 at a depth of 11 feet below the ground surface. The surface soil sample (0-2 feet) collected at this location had ETPH concentrations below levels of concern. Therefore, the ten feet thick interval of clean soil between the ground surface and impacted soil at depth provides a barrier to prevent worker exposure.
-*Sediment* = Yes, a pathway for human exposure exists to contaminated sediment above levels of concern for Rogers Corporation employees. However, since employees are not exposed to contaminated sediments in the course of normal work activities, the potential for exposure is very low.

Day-Care (or other non-production and possibly sensitive receptor uses (e.g., schools, hospitals, etc.)) via "contaminated":
-*Groundwater* = No complete pathway. No day care or other sensitive uses (e.g., schools, hospitals, etc.) can be reasonably expected near contaminated groundwater plume, and these receptors are not expected to have other contact with contaminated groundwater.
-*Soil (surface)* = No complete pathway. No day care or other sensitive uses can be reasonably expected near contaminated surface soil.
-*Soil (subsurface)* = No complete pathway. No day care or other sensitive uses can be reasonably expected near contaminated subsurface soil.

Construction (workers) via "contaminated":
-*Groundwater* = No complete pathway. Depth to groundwater at the site ranges from 5 to 15 feet below the ground surface. No construction at this depth is planned or anticipated.
-*Soil (surface)* = Yes, a pathway for human exposure to contaminated shallow soil exists. However, no construction in areas of contaminated surface soil is planned or anticipated.
-*Soil (subsurface)* = No, a pathway for human exposure to contaminated subsurface soil does not exist. The identified contaminated subsurface soil at the site is at PAOC-05 (abandoned 30,000-gal. UST). The shallow soil in this area is clean and serves as a barrier to subsurface soil during construction activities at the surface. No construction in areas of contaminated subsurface soil is planned or anticipated.

Trespassers via "contaminated':
-*Soil (surface)* = No complete pathway. Areas of surface soil exceeding levels of concern are located inside the facility fence. No trespassers are expected within the fenced area of facility (fence is well maintained), and inspection of fenced-in area of facility has not provided evidence of trespassers under current conditions.
-*Sediment* = No complete pathway. The facility is fenced on three sides preventing off-site access. The fourth side is adjacent to the Quinebaug River. A dam in the river upstream of the facility prevents boat access to the site. Downstream of the site, there are no public boat launches and overland access to the river is difficult due to steep river bank slopes. The area across the river from the site is undeveloped and heavily wooded. Therefore, it is unlikely that trespassers will proceed upriver to the site.

Recreation (users) via "contaminated":
-*Soil (surface)* = No complete pathway. Areas of surface soil exceeding levels of concern are located inside the facility fence. Recreational users are not expected within fenced area of facility, and inspection of fenced-in area of

facility has not provided evidence of recreational users under current conditions.
-*Sediment* = No complete pathway. There is limited access to the Quinebaug River in the area of the site. There is a dam upstream that prevents boat access and there are no known boat launches downstream; the Rogers facility itself is fenced and the area across the river is heavily wooded.

Food contaminated via:
-*Groundwater* = No complete pathway. No food items are produced/grown in contact with "contaminated" groundwater.
-*Soil (surface)* = No complete pathway. No food items are produced/grown in contact with "contaminated" surface soil (e.g., no foods are produced on-site and no off-site surface soil has been identified to be "contaminated".
-*Soil (subsurface)* = No complete pathway. No food items are produced/grown in contact with "contaminated" subsurface soil (e.g., no foods are produced on-site and no off-site surface soil has been identified to be contaminated".
-*Sediment* = No complete pathway. The only potential food item that may be in contact with contaminated sediment are fish. The facility is fenced on three sides preventing off-site access. The fourth side is adjacent to the Quinebaug River. A dam in the river upstream of the facility prevents boat access to the site. Downstream of the site, there are no public boat launches and overland access to the river is difficult due to steep river bank slopes. The area across the river from the site is undeveloped and heavily wooded. Therefore, it is unlikely that trespassers will proceed upriver to the site to conduct fishing activities.

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):

-*Groundwater:* A complete pathway was identified in #3 for Workers. The mechanism in which a worker could potentially be exposed is by consumption or contact of contaminated water from the facility supply well. However, contaminants have not been identified in the facility supply well. Sampling of the supply well occurs annually in accordance with Connecticut General Statutes Section 19-13-B102 "standards for quality of public drinking water".
-*Soil (surface):* Complete pathways were identified in #3 for Workers, and Construction. The locations where surface soil samples exceeded levels of concern are in areas where asphalt surfaces were observed to be in poor condition. The exceedances for surface soil at these areas consisted of samples with PAH concentrations. The detected constituents are common constituents of asphalt, which was visible in samples. In our opinion, detected constituents in surface soil due to the presence of asphalt fragments in the samples do not represent a significant exposure risk.

[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):

Not Applicable

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 **Rogers Corporation** facility, EPA ID # **CTD001141167**, located at **One Technology Drive, Killingly, Connecticut** 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) Signature on File Date 4/21/04
(print) Edgar A. Davis
(title) RCRA Facility Manager

Supervisor (signature) Signature on File Date 4/21/04
(print) Matt Hoagland
(title)Chief, RCRA Corrective Action Section
(EPA Region or State) Region 01

Locations where hardcopy References may be found:

Rogers Corporation (One Technology Drive, Killingly, CT)
Connecticut Dept. of Environmental Protection-File Room-79 Elm St., Hartford, CT
USEPA Region 1 Offices, 90 Canal Street, Boston, MA

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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.