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: Former Cramer Company
Facility Address: 139 Mill Rock Road East, Old Saybrook, CT 06475
Facility EPA ID #: CTD001162114

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			TCE up to 370 ug/l; PCE up to 13 ug/l
Air (indoors)[2]		X		VOC concentrations are well below CT ground water and soil vapor volatilization criteria
Surface Soil (e.g., <2 ft)		X		remediated in 1984 and 1999
Surface Water		X		contaminant concentrations are well below CT surface water protection criteria
Sediment		~~X~~	X	No sediment data avail, but potential for previous releases.
Subsurf. Soil (e.g., >2 ft)		X		remediated in 1984 and 1999
Air (outdoors)		X		VOC concentrations are well below CT ground water and soil vapor volatilization criteria

_____ 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): The key contaminants are TCE up to 370 ug/l and PCE up to 13 ug/l. The Connecticut Ground Water Protection Criteria (GWPC) for both of these contaminants is 5 ug/l.

Supporting documentation includes: 1) Summary of quarterly ground water sampling results, September 1997 through July 1999 (Attachment 5); 2) Supplemental Subsurface Investigation Report, August 1998; 3) Results of September 1998 soil sampling in septic leach fields (in preparation); 4) Results of November 1998 soil sampling below the former tumbling and plating rooms (in preparation); 5) Results of November 1998 soil sampling in the former surface impoundment to achieve closure by equivalency demonstration (in preparation); 6) Results of March 1999 remediation of soil at the southeast corner of the former Cramer building (in preparation); 7) Results of May 1999 remediation of soil beneath the former hazardous waste storage area (in preparation); 8) Results of July 1999 remediation of soil beneath the former oil room (in preparation).

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	yes	~~no~~ yes	no	no			no
~~Air (indoors)~~	___	___	___				
~~Soil (surface, e.g., <2 ft)~~	___	___	___	___	___	___	___
~~Surface Water~~	___	___			___	___	___
~~Sediment~~	___	___			___	___	___
~~Soil (subsurface e.g., >2 ft)~~				___			___
~~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

Rationale and Reference(s): See Attachment 1

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

Attachment 1

The former Cramer Company property is not residential and is supplied public water. Ground water beneath the site is not used. The depth to ground water beneath the site is greater than eight feet below grade. No construction activities on site have or will extend to the depth of the water table. The contaminants of concern are volatile organic compounds (VOCs), which do not bioaccumulate and pose no significant risk to the food chain.

The building that housed the former Cramer Company has been renovated, subdivided and leased to four commercial tenants. The tenants and their activities include: Shoreline Gymnastics (a gymnastics school for children), Balfour Beatty Construction (a field office for electrification of the Amtrac rail line in eastern Connecticut), Godiva Choclatiers (a mail order office for a candy manufacturer) and Business and Legal Reports (a copying, binding and distribution operation for technical reports).

A new one-story office building is nearing completion on the lower part of the site, near the location of the former surface impoundment. No tenants have yet occupied this building. No exposure to contaminated ground water is likely for the current or anticipated future use at either building.

There is the potential for a complete exposure pathway with respect to any downgradient residents who rely on wells for their water supply. This is, however, ~~an extremely limited potential pathway, with no potential for~~ significant human exposure, ~~as diseussed in #4 (below)~~. needs to be evaluated further.

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."

_X_ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): See Attachment 2
It is unknown whether exposure of residents to contaminated groundwater (through drinking water wells) or whether exposure to contaminated sediments may be significant.

[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.

Attachment 2

The attached Figure 1 is a site map which shows the location of the TCE plume within the valley sand and gravel aquifer on the former Cramer Company property. This aquifer is comprised of glacial outwash that was deposited in the valley of the Oyster River. The highest concentrations of TCE on the former Cramer property have been measured in monitoring wells screened near the bottom of the sand and gravel aquifer, at a depth of approximately 25 to 30 feet below grade. The TCE concentrations shown on Figure 1 were measured in July 1999 in monitoring wells screened near the bottom of the aquifer, in approximately the 25 to 30-foot interval.

Figure 1 shows that the southern extent of the TCE plume is to the north of monitoring wells MW97-1 and MW99-3. The southern property boundary of the former Cramer property is immediately south of MW99-3. The closest downgradient resident using ground water is the Hunt residence, located approximately 1,000 feet to the south of MW97-1, at 171 Elm Street. We believe it is unlikely that contaminated ground water has migrated from the former Cramer property to the Hunt residence.

The Hunt well is 59 feet deep, with 50 feet of 6-inch diameter steel casing extending to the bedrock surface at a depth of 48 feet below grade. The well has a relatively large yield of 20 gallons per minute, most likely because the top several feet of bedrock is relatively fractured and in hydraulic connection with ten feet of relatively permeable coarse sand and gravel that overlies the bedrock surface, in the interval of 38 to 48 feet below grade. A well completion report for the Hunt well is included as Attachment 4. We presume that the bulk of the yield of the Hunt well is derived from the relatively permeable sand and gravel that forms the bottom of the sand and gravel aquifer filling the valley of the Oyster River. For this reason, we presume that the Hunt well is hydraulically connected to the same vertical interval of the valley sand and gravel aquifer as are the deep monitoring wells in the valley aquifer on the former Cramer property.

The Hunt well was sampled and analyzed for volatile organic compounds (VOCs) in July 1990, as part of a CERCLIS Final Screening Site Inspection (SSI) conducted by the CTDEP on a former furniture stripping facility (Saybrook Strip Shop) that was located next door at 169 Elm Street. Furniture stripping rinse waters were discharged untreated to the septic system at 169 Elm Street. No VOCs were detected in the Hunt well. Moderate levels of VOCs were detected in the well on the property on which Saybrook Strip Shop was located. This well is no longer used as a source of potable water. No information regarding the construction of the Saybrook Strip Shop well is available. Because the Hunt well appears to derive much of its yield from the sediments at the bottom of the sand and gravel aquifer within the valley of the Oyster River, we believe it is reasonable to presume that if VOCs from the plume at the bottom of the same sand and gravel aquifer on the former Cramer property had migrated as far as the Hunt property, those contaminants would be detected in the Hunt well. Because the Hunt well is the closest off site downgradient well relative to the former Cramer property and no VOCs were detected in the Hunt well, we believe it is unlikely that any human receptors farther downgradient will experience significant exposure to ground water contaminants that may potentially migrate from the former Cramer property.

It is noted that there are several other potential sources of contamination of ground water with VOCs (in addition to the former Saybrook Strip Shop), which are more proximate to the Hunt well than the former Cramer property. These other potential sources are identified in the SSI report. One potential source is Pye & Hogan Company, located across the street to the southeast at 167 Elm Street. Pye & Hogan operated a vapor degreaser and had a fire in September 1989, during which drums exploded. A second potential source of VOCs identified by the SSI is the Ryther Purdy Lumber Company, located across Elm Street to the southwest of the former Saybrook Strip Shop. Ryther Purdy disposed of wood treatment chemicals to the ground during treatment of utility poles. A copy of the SSI report is included as Attachment 5.

Current Human Exposures Under Control
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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.

X 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):

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 former Cramer Company _____ facility, EPA ID # CTD001162114_____, located at 139 Mill Rock Rd East, Old Saybrook, CT 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."

X IN - More information is needed to make a determination.

Completed by (signature) Stephanie Carr Date 12/29/99
(print) Stephanie Carr
(title) RCRA Facility Manager

Supervisor (signature) _____ Date _____
(print) _____
(title) _____
(EPA Region or State) _____

Locations where References may be found:

Connecticut Department of Environmental Protection, Hartford, CT
US Environmental Protection Agency, Region 1, Boston, MA
Environmental Products & Services, Inc., Milford, CT
Pepper Hamilton, LLP, Philadelphia, PA

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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.