DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code [redacted]

Facility Name: Ethyl Corporation – Houston Plant
Facility Address: 1000 N. South Street, Pasadena, Texas
Facility EPA ID#: TXD-008096158-0

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 only as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

p 1-5 completed by company (Reviewed by PM.)

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			*Key contaminants: EDC; 1,1-DCA; vinyl chloride; lead*
Air (indoors)[2]		X		*Areas of affected soils located away from buildings.*
Surface Soil (e.g., <2 ft)	X			*Key contaminants: EDC and lead*
Surface Water		X		*Corrective action systems in operation to control plume migration*
Sediment		X		*No affected sediments are known to be present*
Subsurf. Soil (e.g., >2 ft)	X			*Key contaminants: EDC and lead*
Air (outdoors)		X		*Areas of affected soils are covered by pavement.*

Note: EDC = ethylene dichloride, also known as 1,2-dichloroethane
1,1-DCA = 1,1-dichloroethane

_____ 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):

Affected groundwater exceeding drinking water MCLs is present in the EL-20 Ft, EL-60 Ft, and EL-110 Ft Sands (see Figures 2a, 2b, 3a, and 3b). The constituents with the highest concentrations and greatest horizontal and vertical extent are ethylene dichloride (EDC, also known as 1,2-dichloroethane) and lead (see Reference 1 on attached reference list). Two groundwater recovery systems are currently operated for removal of affected groundwater from the EL-20 Ft Sand. Recovery of affected groundwater from the EL-60 Ft Sand will be initiated under the requirements of the Compliance Plan renewal dated October 6, 1999 (see Reference 2). Further investigation of soil conditions in the EL-110 Ft Sand and investigation of groundwater conditions in the EL-180 Ft Sands are also required by the Compliance Plan renewal.

Surface and subsurface soils containing elevated concentrations of lead (>1000 mg/kg) were detected during previous RFI work programs at the Process Canal, NOR 33, located in the North Plant Area (see References 3, 4, and 5). Subsurface soils containing elevated concentrations of EDC are potentially present in the North Plant Area and South Plant Area based on elevated OVA readings shown on historical boring logs (Figure 4).

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

Rationale and Reference(s):

All items noted "yes" on the above table are identified as potentially complete exposure pathways. However, there are no known actual human exposures to contaminated media at the facility. For further discussion of these potentially complete pathways, please refer to the information on page 4.

[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. " (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):

The only potentially "unacceptable" exposure pathways are for scenarios in which construction workers are exposed to affected surface or subsurface soils during excavation activities at the North Plant Area and the South Plant Area. Exposure of plant workers to affected surface soils is not expected to be significant, because most areas of affected surface soils are covered by pavement, and are not in areas continuously or regularly occupied by site workers.

For the on-site groundwater pathway, consumption of affected groundwater from a hypothetical well located on the facility has been identified as a potentially complete pathway. Affected groundwater is present at on-site locations in three water-bearing units (EL-20 Ft, EL-60 Ft, and EL-110 Ft Sands). One or more of these sands would likely be considered as a potentially usable resource. However, groundwater from these three sands is not presently used as a water supply on the Ethyl Houston Plant. Plant worker and construction worker exposures to affected groundwater are therefore not expected.

Off-site (non-residential) consumption of affected groundwater from a hypothetical well at the facility boundary has been identified as a potentially complete exposure pathway for the facility. However, off-site migration of affected groundwater is currently prevented by operation of corrective action systems, and no water supply wells identified within a one-mile radius of the plant are screened in the EL-20 Ft, EL-60 Ft, and EL-110 Ft Sands. Off-site exposure to affected groundwater is therefore not expected. This site is located in an area of dense industrial development along the Houston Ship Channel. The closest residential development is located approximately 9000 ft (1.7 miles) south of the affected groundwater zones.

[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.

X If unknown (for any potentially "unacceptable" exposure) – continue and enter "IN" status code.

Rationale and Reference(s):

There is insufficient soil sampling data available to allow determination of whether "significant" exposures are or are not with "acceptable" limits. Additional soil sampling data will be collected during the upcoming RFI work programs required by the Compliance Plan renewal.

per Project Manager review (January 2000), answer to this question is "yes". See database/document list.

SWR 30465
II

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)
Page 6

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 Ethyl Corporation facility, EPA ID #TXD008096158, SWRN 30465, located in Pasadena, TX under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

Doc 6476
Rep 2849

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.
(1) **Incomplete information**
(2) **Reports in house, yet to be reviewed**
(3) **Unfamiliar site**

For "NO" or "IN" determination, expected date of "YE" determination _____

Completed by (signature) Maureen M Hatfield Date 01/13/2000
(print) Maureen Hatfield
(title) Project Manager

Supervisor (signature) Cathy Rommert Date Jan 24, 2000
(print) Cathy Rommert
(title) Supervisor
(EPA Region or State) TNRCC

Locations where References may be found:

If "YE" Code is assigned then attach a copy of database, highlight the reports which support "YE"determination.

See attached

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.