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: Borden Chemicals Inc.
Facility Address: P.O. Box 427 Geismar, LA 70734
Facility EPA ID #: LAD 003913449

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_	___	___	_____
Air (indoors)[2]	___	_X_	___	_____
Surface Soil (e.g., <2 ft	_X_	___	___	_____
Surface Water	___	_X_	___	_____
Sediment	___	_X_	___	_____
Subsurf. Soil (e.g., >2 ft)	_X_	___	___	_____
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 and Reference(s): As the result of extensive investigative activities begun by BCP in the mid-1980s and extending to the present day, the geology, hydrogeology, and contaminant distribution at BCP's Geismar site are well-understood. See Remediation Investigation & Remediation Measures Study (October 1998), Chapters 2.0, 3.0, and 5.0. In terms of contaminant distribution, sampling on the site has indicated the presence of ethylene dichloride (EDC), the key contaminant, and a few other chemicals at levels exceeding their Maximum Contaminant Levels (MCLs) level within some of the shallow transmissive zones beneath the site. See Remediation Investigation & Remediation Measures Study (October 1998), Chapter 5.0. However, none of these transmissive zones is used for drinking water purposes, and, as set forth more fully in BCP's response to Question No. 2 of the attached Human Exposure survey, the presence of the EDC in these shallow zones poses no unacceptable risk to human health. Further, as described more fully in BCP's response to Question No. 3 of this survey, sampling off-site and within the Norco Aquifer (the shallowest drinking water aquifer beneath the site) has resulted in uniformly non-detect samples. Finally, as described more fully in BCP's response to Question No. 3 of this survey, all of the groundwater contamination is contained on-site as a result of several remediation systems currently operating at the site.

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), Remediation Investigation and Remedial Measures Study (Oct. 1998 and Consent Decree for Borden Chemicals and Plastics Operating Limited Partnership, v. Carol Browner as Administrator of, and the United States Environmental Protection Agency, Civil Action No. 94-440-A-2,

consolidated with, United States v. Borden Chemicals & Plastics Operating Limited Partnership; Borden Chemicals & Plastics Management, Inc. Civil Action No. 94-2592-A-M2 in the United States District Court for the Middle District of Louisiana.

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_
Soil (surface, e.g., <2 ft)	_no_	_no_	_no_	_no_	_no_	_no_	_no_
Soil (subsurface e.g., >2 ft)				_no_			_no_

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.

__X__ 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: The EDC found in the shallow groundwater at the BCP site is the result of incidents that occurred prior to this decade. Thus, the source of the EDC's entry into the subsurface has been abated.

With regard to the shallower transmissive zones (i.e., the zones above the Norco Aquifer), there should be no further lateral migration of contaminants for two reasons. First, BCP's Shallow Groundwater Recharge and Recovery System maintains a capture zone that encompasses a major portion of the contaminated area. (See documents, "Groundwater Recharge Units 1998 Annual Demonstration," February 1999 and "Annual Groundwater Report 1998," February 1999). Second, absent the influence from the recharge and recovery system, the dominant direction of groundwater flow is downward (See document, "NORCO Aquifer Well System Installation,

Hydrogeology, and Groundwater Modeling"). The system presently in place at BCP has been designed to account for this condition

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), Remediation Investigation and Remedial Measures Study (Oct. 1998) NORCO Aquifer Well System Installation, and Groundwater Modeling (Aug. 1998) and Consent Decree for Borden Chemicals and Plastics Operating Limited Partnership, v. Carol Browner as Administrator of, and the United States Environmental Protection Agency, Civil Action No. 94-440-A-2, consolidated with, United States v. Borden Chemicals & Plastics Operating Limited Partnership; Borden Chemicals & Plastics Management, Inc. Civil Action No. 94-2592-A-M2 in the United States District Court for the Middle District of Louisiana.

Potential human exposure pathways to contaminated surface soils through dermal contact and incidental ingestion by onsite workers, and construction/utility workers is considered to be insignificant due to the following controls that are currently in place at the facility.

The facility is restricted to authorized, trained, company personnel, and authorized, trained visitors. Access to the plant is restricted by a perimeter fence with guarded gates, regular patrolling of the property, and surveillance by video cameras. Exposures to chemicals in the surface soils is controlled also by the on-site work permit process, the excavation program, and other OSHA site safety programs that require the use of personal protective equipment and personal monitoring during work activities. There are detailed health and safety programs in place maintained in the Engineering and Technology Building that will preclude inadvertent exposure to the impacted areas. Personal protective equipment (PPE) requirements are implemented by all site-related personnel who may come into contact with contaminated media through daily activities or via intrusive activities (i.e, excavation, construction) to reduce direct contact exposures. Personal protective equipment requirements and excavation restrictions are in place to minimized or eliminate direct contact exposures by workers and future construction workers to contaminated soils (surface and subsurface) and groundwater identified at various locations in the process areas. Because of these work practices that are in place at the facility, exposures are considered to be insignificant.

In compliance with the Consent Decree between Borden Plastics and Chemicals (BPC) and the United States and the State of Louisiana BPC conducted an assessment of the surface soils at the Hazardous Waste Container Storage Area. As reported in the Mercury Work Plan Completion Report (IT Corporation, March 2002) a soil sample detected semivolitile compounds (SVOC) that exceeded the Risk Evaluation and Corrective Action Program (RECAP) soil industrial screening standards. As a result of a verbal request the Louisiana Department of Environmental Quality (LDEQ) Borden Chemicals Inc. (BCI) had the soils, from the area where the SVOCs were detected, excavated. Soil samples were collected from the excavation and BCI demonstrated that the contaminated soils were removed in a Addendum to the Mercury Work Plan Completion Report submitted in August 2004.

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):_____

[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):_____

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 Borden Chemical Inc. facility, EPA ID # LAD 003913449, located at Geismar Louisiana 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) Robert Frischhertz Date 12/13/04
(print) Robert Frischhertz
(title) Geologist 3

Supervisor (signature) Douglas Bradford Date 12/16/04
(print) Douglas Bradford
(title) Geologist Supervisor
(EPA Region or State) Louisiana Department of Environmental Quality, EPA Region 6

Locations where References may be found:

Louisiana Department of Environmental Quality, Public Records Center. Galvez Building, Room 127, 602 N. Fifth Street, Baton Rouge, LA 70802. From 8:00 a.m. to 4:30 p.m., Monday-Friday. phone (225) 219-3168 or email publicrecords@la.gov

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.

Attachments Available
Upon Request