

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: BP Products North America Inc., Texas City Refinery  
Facility Address: 2401 Fifth Avenue South, Texas City, Texas 77590  
Facility EPA ID #: TXD 008080533  
TCEQ Solid Waste Registration ID #: SWR# 30139

At the request of the Texas Commission on Environmental Quality (TCEQ), this form was completed to assist TCEQ in measuring the progress of facility wide clean-up as part of the EPA Strategic Plan - 2020 Corrective Action Baseline. The BP Products North America Inc. Texas City Refinery (BP) is performing remediation under a 1991 Agreed Order issued by the Texas Water Commission now the TCEQ, and has performed RCRA corrective action under facility RCRA Permit No. HW-50255. Consequently, the information on both programs has been combined in the following form.

- 1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA and Non-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?

Note: BP has addressed relevant and significant information for both RCRA corrective action and historical product releases under the 1991 Agreed Order for this CA725.

- 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).

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2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated"<sup>1</sup> 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)?

	<u>Yes</u>	<u>No</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	<u>  </u>	Hydrocarbons from refinery operations exist as LNAPL.
Air (indoors) <sup>2</sup>	<u>  </u>	<u>X</u>	see rationale below
Surface Soil (e.g., <2 ft)	<u>X</u>	<u>  </u>	Due to shallow groundwater, soils <2ft may be impacted.
Surface Water	<u>  </u>	<u>X</u>	There are no surface water bodies within the refinery or runoff from the refinery. No plume migration to surface water is occurring.
Sediment	<u>  </u>	<u>X</u>	See comments on surface water.
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	<u>  </u>	Subsurface soil are impacted by hydrocarbon releases from refinery operations.
Air (outdoors)	<u>  </u>	<u>X</u>	Impervious cover in the refinery and the clay nature of the soils prevent measurable volatilization to the atmosphere over the NAPL plume.

       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)**

Figure 1 shows the extent of the groundwater plume. Due to the presence and nature of the LNAPL, it is assumed that TRRP risk based levels would be exceeded in both soil and groundwater. The LNAPL consists of crude and various intermediate and refined petroleum hydrocarbons, however based on process knowledge of plant operations, no chlorinated compounds exist in the NAPL plume. LNAPL in the shallow groundwater zone has created a smear zone of impacted soils above the NAPL plume in areas well away from the initial release, therefore soils above the LNAPL plume are believed to be impacted. In limited cases due to shallow groundwater soils <2 feet may be part of the smear zone, however, there is no evidence of liquid hydrocarbons at the surface. Figure 1 also shows the hydrocarbon recovery system and monitoring wells network. Semiannual monitoring has indicated that the entire free phase and dissolved phase extent of the plume is contained onsite. All storm-water runoff is controlled through permitted outfalls. Annual year-end sampling reports are submitted to TCEQ and contained in the refinery HSSE files. Personal air monitoring for known contaminants (including hydrocarbons) is routinely conducted and reflective of potential employee exposures experienced during a typical workshift (including time spent indoors and outdoors.) Monitoring results are typically below applicable limits. In rare instances where potential exposure exceedances occur, action is taken to reduce potential exposures below applicable limits.

The RCRA Facility Assessment and subsequent 1991 RCRA Facility Investigation (RFI) conducted under the Permit, identified ten RFI Areas subject to RCRA corrective action. Since submittal of the RFI report, BP has addressed the contaminated media associated with each RFI Area and submitted reports documenting compliance with TCEQ risk-based levels. In response, the TCEQ has issued a No Further Action (NFA) letter for all ten RFI Areas. Copies of these letters are attached to this report. An October 16, 1997 letter grants NFA for RFI Area 1. A June 5, 1998 letter grants NFA for RFI Area 2. An April 5, 2000 letter grants NFA for RFI Areas 3,4,5 and 10. A January 18, 2006 letter grants NFA for RFI Areas 6,7,8, and 9. Therefore, only the hydrocarbon groundwater plume areas are contaminated above risk-based levels.

Footnotes:

<sup>1</sup> "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).

<sup>2</sup> 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.

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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? **NA for RCRA Corrective Action, answers below apply to historical product releases under 1991 Agreed Order.**

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

<u>"Contaminated" Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Air (indoors)	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Soil (surface, e.g., <2 ft)	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Surface Water	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Sediment	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Soil (subsurface e.g., >2 ft)	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>
Air (outdoors)	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>

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):

The plume is entirely within the refinery boundary. Site access is strictly controlled and limited to authorized personnel. A potential "complete pathway" between contamination and human receptors exists during excavation of contaminated soils. Existing OSHA regulations and internal procedures are used to manage potential exposures (e.g. continuous monitoring for hydrocarbons during excavation, adjusting respiratory protection as appropriate based on results of that monitoring).

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Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (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):**

As communicated in #3, during the excavations of contaminated soils, existing OSHA regulations and internal procedures are used to manage potential exposures. Additionally, as indicated in #2, RCRA corrective action areas have received NFA status with no requirement for physical controls and are not contaminated above protective levels. Therefore, no significant exposures are reasonably expected for both the 1991 Agreed Order area and the RCRA corrective action area.

<sup>4</sup> 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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N/A

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):

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Note: The RCRIS status code for the CA725 for both the 1991 Agreed Order Historical product releases and the RCRA corrective action areas is the same; therefore, both areas are combined in the response below.

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 **BP Products North America Inc. Texas City Refinery, EPA ID # TXD 008080533, located at 2401 Fifth Avenue South, Texas City, TX 77590** 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 \_\_\_\_\_  
(print) Treana Piznar  
(title) Environmental Team Leader, Water/Waste

Locations where References may be found:

References can be found in the HSSE files at the BP Texas City Refinery. These include annual year-end sampling reports submitted to the TCEQ and No Further Action letters for RCRA Corrective Action areas.

Contact telephone and e-mail numbers

(name) Treana Piznar  
(phone #) (713) 447-9270  
(e-mail) Treana.piznar@bp.com

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.

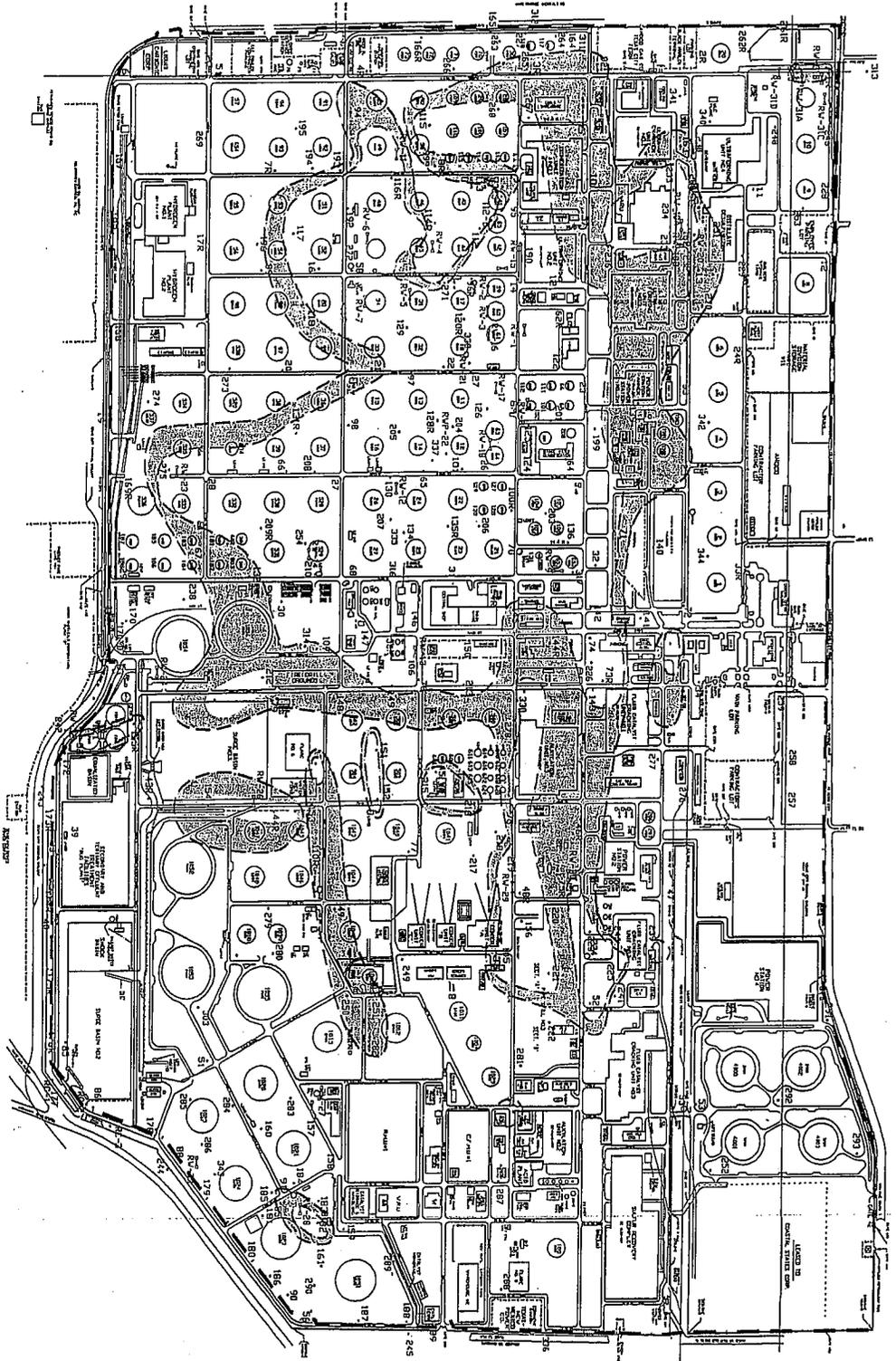


Figure 1



- LEGEND**
- 187 • HONORING WELL LOCATION
  - RW-13 RECOVERED SYSTEM
  - RESOLVE-PHASE 350000 BENTONITE SLURRY 350000 TOTAL BTEX SOLUBLE IN WATER
  - PHASE-SEPARATED HYDROCARBON EXTENT

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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 BP Products North America Inc. facility, EPA ID # TXD 008080533, located at Texas City 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]  
(print) Chris Swiderski  
(title) Project Manager

Date 1/26/09

Supervisor (signature) [Signature]  
(print) JASON WANG  
(title) Supervisor  
Texas Commission on Environmental Quality

Date 1/26/09

Locations where References may be found:

TCEQ Central Records, Austin, TX

Contact telephone and e-mail numbers:

Project Manager listed above  
(512) 239-2200

Cswiders @tceq.state.tx.us

**Final Note:** The purpose of the Human Exposures EI is to qualitatively screen exposures based on current land and groundwater use. A "YE" determination does not constitute a screening tool that ends the corrective action process. The "YE" determination may be changed at any time as new information becomes available.