**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:** | Rohm and Haas Company - Philadelphia Plant |
| **Facility Address:** | 5000 Richmond Street, Philadelphia, PA 19137 |
| **Facility EPA ID #:** | PAD077883346 |

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).

**Facility History**

The Rohm and Haas Company's Philadelphia Plant is divided into an East Production Area, West Production Area and Former Warehouse Property located along the Delaware River in the Port Richmond section of Philadelphia. Corrective Action at the Former Warehouse Property has been managed under PADEP's Land Recycling (Act II) Program and is not currently included in the work being done under EPA's RCRA Corrective Action Program.

Historical activities in the East Production Area have included chemical manufacturing operations, materials and product storage, steam and electricity production, wastewater management, and both hazardous and non-hazardous waste management. Rohm and Haas began its chemical processing operations at the facility in 1920, although chemical manufacturing is believed to have begun at this location as early as the 1700s. Recent manufacturing operations include solvent recovery, Tritons manufacturing, ion exchange resins, and dithane manufacturing. Some of the chemicals associated with these manufacturing processes include surface active agents, DDT, mancozeb, octhilinone, dicofol dinocap, chloromethylisothiazolin, sulfuric acid, 1,2-dichloropropane, 1,2-dichloroethane, chlorobenzene, toluene, amines, acids, methylene chloride and zinc. The only active operation in the East Production Area currently is a maintenance shop. Rohm and Haas plans to move the maintenance shop to the West Production Area in the near future. Rohm and Haas is also planning to demolish the remaining structures in the East Production Area.

The West Production Area also has industrial roots that go back to the early 1700's, when tanneries moved to that location from Center City Philadelphia. Manufacturing operations in this area have included the production of herbicides, pesticides, biocides, ion exchange resins, alkylphenols, surfactants, specialty monomers, amberchrome precious metals recovery, and orthochrom leather tanning products. In recent years, Rohm and Haas manufacturing operations in the West Production Area have focused on Ion Exchange Resin and Goal® herbicide production. An ongoing groundwater recovery program is being conducted in the Bridge Street portion of the West Production Area.

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 | | | Numerous VOCs, semi-VOCs, pesticides and inorganic constituents have been detected in groundwater beneath the site at concentrations above EPA RBCs and PADEP MSCs. |
| Air (indoors)[2] | | X | | Historical groundwater/indoor air data and screening models do not indicate a release to indoor air above risk based levels. |
| Surface Soil (e.g., <2 ft) | X | | | Numerous VOCs, semi-VOCs, pesticides and inorganic constituents have been detected in site soils at concentrations above EPA RBCs and PADEP MSCs. |
| Surface Water | | X | | Only stormwater and non-contact cooling water are discharged to the Frankford Inlet and Delaware River. Based on actual groundwater data and groundwater modeling, the Delaware River is not being significantly impacted by the discharge of contaminated groundwater into the water body. |
| Sediment | X | | | Pesticides including 4,4'-DDD and 4,4'-DDE were detected in sediments of the Frankford Inlet in the early 1970's at levels in excess of PADEP's Residential Direct Contact Soil MSCs. |
| Subsurf. Soil (e.g., >2 ft) | X | | | Numerous VOCs, semi-VOCs, pesticides and inorganic constituents have been detected in site soils at concentrations above EPA RBCs and PADEP MSCs. |
| Air (outdoors) | | X | | No contaminants were detected at concentrations above the applicable screening criteria in samples collected as part of Rohm and Haas' outdoor air monitoring program. |

____ 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.

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[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.

**Rationale and Reference(s):**

**Groundwater**:

The Rohm and Haas Philadelphia Plant is physically located near the boundary of the Piedmont Physiographic Province and the Atlantic Coastal Plain. The surface of the site consists of fill material (a mixture of silty sand, gravel, cinders, bricks and concrete rubble) that ranges in thickness from 6 feet in the northern portion of the West Production Area to about 30 feet near the topographic high point near the center of the facility in the East Production Area. The fill material contains the upper, unconfined water-bearing unit at the site. Beneath the fill material is alluvium or residual soils that overlie the shallow Wissahickon Schist bedrock. The top layer of the alluvial deposits consists of silty clay that ranges in thickness from 5 to 38 feet and acts as a confining layer between the unconfined aquifer and the water-bearing lower granular deposit. The lower granular deposit is comprised of yellow-brown coarse to fine sands with localized silty clay seams. The lower granular deposit appears to pinch out beneath the Frankford Inlet on the northern end of the East Production Area and has a maximum thickness of about 28 feet on-site. These deposits are not believed to be hydraulically connected with the Potomac-Raritan-Magothy water producing aquifers that serve much of southern New Jersey. These aquifers do not extend beneath the Delaware River in the site vicinity, according to U.S. Army Corps of Engineers drawings. The bedrock beneath the deposits is the Wissahickon Schist formation, which occurs at depths ranging from approximately 40 to 50 feet below the ground surface.

Groundwater flow in the upper water-bearing unit discharges into the Frankford Inlet and Delaware River along the property boundaries with those water bodies. Groundwater flow is also influenced by numerous underground utilities and historically had been influenced by former building sump pumping activities. These influences have created a groundwater depression in the central portion of the property which draws in groundwater from a large portion of the site in both the East and West Production Areas. The discharge point for the groundwater depression has not been verified. It is unclear whether groundwater at this location is discharging into the lower water-bearing unit and eventually into the Delaware River or discharging into the various underground utilities beneath the site. A groundwater mound near the R7F Tank Farm formerly allowed the movement of groundwater toward a residential area south of Brill and Bridge Streets. Since a groundwater management system was installed by Rohm and Haas in 1995, the mound has been reduced by approximately four feet and hydraulic gradients near the facility boundary have been controlled.

Groundwater flow in the lower water-bearing unit is generally to the east toward the Delaware River. This unit is semi-confined and is more greatly affected by tidal influence than the upper unconfined unit, fluctuating between 0.5 feet and 3 feet in response to the tides. Some water from the lower water-bearing unit may be finding its way into the Frankford Inlet in the vicinity of the Upper Delaware Low Level Collector Sewer (UDLLC) crossing, where the confining unit appears to pinch out. The UDLLC is an 11 foot wide component of the Philadelphia Water Department's sewer system that enters the facility boundary from the north at Frankford Inlet exits the facility's southern boundary at Garden Street.

In 1984, Rohm and Haas implemented a monitoring program to assess the groundwater quality at its Philadelphia Plant. The initial investigation consisted of the review of 99 boring logs, the installation and sampling of 37 new monitoring wells (in addition to the 11 existing wells), the performance of hydrogeologic tests on the wells, the review of historic site and vicinity information, and computer modeling of localized and regional groundwater flow to estimate the movement of groundwater contaminants. The investigation results were included in the 1987 Groundwater Study and Risk Assessment. Sitewide groundwater monitoring occurs biennially at the facility with semiannual monitoring occurring at the Bridge Street Area.

Historical groundwater data indicates the presence of many volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and inorganic constituents in the upper water-bearing unit underlying the East and West Production Areas. The most prevalent VOCs detected in this unit include 1,2-dichloroethane, 1,2-dichloropropane, toluene, ethylbenzene, chlorobenzene, methylene chloride and xylene. Total VOC concentrations, which range from nondetect to over 100 mg/l, are highest in the south portion of the West Production Area near the R7F tank farm, and near Building 6B in the East Production Area. The predominant SVOCs in the upper water-bearing unit include bis(2-chlorethyl)ether, naphthalene, three isomers of dichlorobenzene, chlorophenols, and phenols. The pesticides DDT, DDE, DDD and heptachlor epoxide have been routinely detected in the groundwater beneath the East Production Area. Both dense and light nonaqueous-phase liquid (NAPL) have been detected in isolated locations in a few of the facility wells. The dense NAPL (DNAPL) consists primarily of chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloropropane, ethylbenzene, 1,2- and 1,4-dichlorobenzene and DDX compounds and is located primarily in the vicinity of Building 6B in the East Production Area. The light NAPL (LNAPL)consists primarily of 2-octanone, 2-octanol, xylenes, toluene and ethylbenzene and is present downgradient of the R7F tank farm in the West Production Area.

Many of the contaminants detected in the upper water-bearing unit have also historically been detected in the lower water-bearing unit underlying the facility. However the concentrations of the contaminants in the lower unit are generally significantly lower than those found in the upper unit. The table on the following page summarizes the groundwater contaminants detected above a risk based screening level during the site-wide sampling event in Fall 2003 and the 2004 Groundwater Management System performance monitoring. The maximum groundwater concentrations are compared to the Pennsylvania Department of Environmental Protection (PADEP) non-residential used aquifer mean specific concentrations (MSCs) and/or EPA Region III's risk based concentrations (RBCs) for tap water.

**Groundwater Contaminants Detected Above Standard/Screening Level (Fall 2003/2004)**

| Contaminant | Location | Maximum Concentration (mg/l) | Non-Res. Used Aquifer MSC (mg/l) | Tap Water RBC (mg/l) |
|---|---|---|---|---|
| 1,2-dichloroethane | TW-14D | 0.049 | 0.005 | 0.00012 |
| 1,2-dichloropropane | TW-5A | 0.28 | 0.005 | 0.00016 |
| benzene | P-18 | 0.26 | 0.005 | 0.00034 |
| chlorobenzene | TW-10S | 3.2 | 0.1 | 0.11 |
| chloroform | OFF-19 | 0.068 | 0.1 | 0.00015 |
| cis-1,2-dichloroethene | TW-5A | 1.9 | 0.07 | 0.061 |
| ethylbenzene | TW-5A | 7.8 | 0.7 | 1.3 |
| MTBE | TW-11D | 0.086 | 0.02 | 0.0026 |
| tetrachloroethene | TW-26S | 0.013 | 0.005 | 0.0001 |
| toluene | TW-31S | 31 | 1 | 0.75 |
| trichloroethene | TW-14D | 0.033 | 0.005 | 0.000026 |
| vinyl chloride | TW-45S | 0.036 | 0.002 | 0.000015 |
| xylene (total) | MW-10 | 36 | 10 | 0.21 |
| 1,4-dichlorobenzene | TW-10S | 0.013 | 0.075 | 0.00047 |
| 2-methylnaphthalene | TW-34S | 0.025 | 4.1 | 0.024 |
| 4-chloroaniline | TW-29S | 0.14 | 0.41 | 0.0012 |
| benzo(a)anthracene | P-12 | 0.0009 | 0.0036 | 0.000092 |
| benzo(a)pyrene | TW-45S | 0.0017 | 0.0002 | 0.0000092 |
| benzo(b)fluoranthene | TW-45S | 0.0013 | 0.0012 | 0.000092 |
| benzo(g,h,i)perylene | TW-45S | 0.0032 | 0.00026 | NS |
| benzo(k)fluoranthene | TW-45S | 0.0018 | 0.00055 | 0.00092 |
| bis(2-chloroethyl)ether | TW-10S | 0.79 | 0.00055 | 0.0000096 |
| bis(2-chloroisopropyl)-ether | TW-12S | 0.024 | 0.3 | 0.00026 |
| bis(2-ethylhexyl)phthalate | TW-44S | 0.035 | 0.006 | 0.0048 |
| dibenz(a,h)anthracene | TW-45S | 0.0024 | 0.00036 | 0.0000092 |
| 2,4-dichlorophenol | TW-5A | 0.022 | 0.02 | 0.011 |
| indeno(1,2,3-cd)pyrene | TW-45S | 0.003 | 0.0036 | 0.000092 |
| naphthalene | OFF-3 | 0.31 | 0.02 | 0.0065 |
| beta-BHC | TW-44S | 0.00012 | 0.0014 | 0 .000037 |
| gamma-BHC (lindane) | OFF-9 | 0.00065 | 0.0002 | 0.000052 |
| 4,4'-DDD | P-12 | 0.00044 | 0.0027 | 0.00028 |
| 4,4'-DDE | TW-6S | 0.088 | 0.0019 | 0.0002 |
| heptachlor | TW-44S | 0.000098 | 0.0004 | 0.000015 |
| heptachlor epoxide | TW-29S | 0.00018 | 0.0002 | 0.0000074 |
| arsenic | TW-14S | 0.193 | 0.05 | 0.000045 |
| iron | TW-14D | 827 | 0.3 | 11 |
| lead | TW-16S | 0.762 | 0.005 | NS |
| manganese | TW-16D | 86.9 | 0.05 | 5.1 |
| vanadium | TW-10S | 0.042 | 0.0058 | 0.037 |

**Surface and Subsurface Soil**:

Several areas of concern (AOCs) have been identified through historic site characterization studies at the facility. A discussion of the impacted soils at these AOCs is found below.

**East Production Area**

The East Production Area is bounded to the west by Richmond Street, to the east by the Delaware River, to the north by the Frankford Inlet and to the south by Brill and Bridge Streets. The 36-acre East Production Area has been further delineated into five distinct areas: Dorsey Park, the Parking Lot Area, East Area 3, and Excavation Zones 1 and 2.

Dorsey Park

Dorsey Park is a grass covered area located in the southern half of the East Production Area. A paved fitness track encircles the grass covered area. Also included in this AOC is the unpaved area located between the grassed covered area and the railroad tracks bordering East Area 3 to the east. Historically, Dithane was manufactured in this area. Some of the chemicals used in this area included dithane, ethylene diamine, carbon disulfide, zinc sulfate and magnesium sulfate. A total of six soil samples (two surface and four subsurface) have been collected from four locations within this AOC. Numerous volatile organic compounds, semivolatile organic compounds, pesticides, and metals were detected in the soils; however, only benzo(a)pyrene (1.67 mg/kg), benzo(b)fluoranthene (4.37 mg/kg), 4,4'-DDD (14.9 mg/kg) and arsenic (13 mg/kg) were detected at concentrations above EPA's direct contact risk based concentrations for industrial settings. The maximum concentrations detected for these contaminants were observed in the surface soil sample collected at SB-10 located in the area between the grass covered area and the railroad tracks.

East Area 3

East Area 3 is a 10.4 acre parcel of land located between the rail spur and the Delaware River. Most of the parcel was created after 1943 by systematically depositing fill material into the river. There were no known production areas in this area; however, the area was used for materials storage and as a contractor staging area. Three subsurface soil samples reportedly were collected in this area. Arsenic (5.2 mg/kg) was the only constituent detected at a concentration above EPA's industrial direct contact risk based concentration (RBC) for that contaminant (1.9 mg/kg).

Parking Lot Area

The Parking Lot Area is located in the southern portion of the East Production Area, with the railroad spur and East Area 3 to the east and the Dorsey Park Area to the north. Rohm and Haas reports that no known chemical manufacturing or storage has occurred in this paved area. A total of five soil borings have been installed in the Parking Lot Area. The following contaminants were detected in at least one soil sample at concentrations greater than the respective industrial direct contact RBC: benzo(a)pyrene (2.5 mg/kg), benzo(b)fluoranthene (5 mg/kg), dibenz(a,h)anthracene (0.7 mg/kg) and arsenic (46 mg/kg).

Excavation Zone 1

Rohm and Haas has designated Excavation Zone 1 as an area where potential excavation activities may occur to maintain underground utilities in the vicinity where DNAPL has been delineated.

This area is located in the northwestern portion of the East Production Area near the former ion exchange resins and pesticides manufacturing area (Bldg. No. 6B). Chemicals used in this area include ethylene diamine, DDT, chloromethyl methyl ether, bis(chloromethyl)ether, methylene chloride, skane (a fungicide) and chlorobenzene. Upon detecting DNAPL in monitoring well TW-13 in 1992, Rohm and Haas installed 24 soil borings in 1993/1994 to delineate the extent of the plume. Approximately 2 soil samples were collected from each boring and analyzed for priority pollutants. Five additional soil borings were installed in 1995 to complete the DNAPL study. All but one of the soils samples collected were from the subsurface at depths greater than two feet. The following contaminants were detected in the soil samples at concentrations greater than the respective industrial direct contact RBC: 1,2-dichloroethane (9,140 mg/kg), 1,2-dichloropropane (26,700 mg/kg), chlorobenzene (148,000 mg/kg), benzo(a)anthracene (26.1 mg/kg), benzo(a)pyrene (22.8 mg/kg), benzo(b)fluoranthene (48 mg/kg), bis(2-chloroethyl)ether (52 mg/kg), dibenz(a,h)anthracene (2.36 mg/kg), 4,4'-DDD (7,440 mg/kg), 4,4'-DDE (531 mg/kg), 4,4'-DDT (2,460 mg/kg) and arsenic (96 mg/kg).

Excavation Zone 2

Excavation Zone 2 includes the remaining areas in the East Production Area as delineated by Rohm and Haas that potentially may be excavated for underground utility maintenance. This zone branches out through much of the central portion of the East Production Area, excluding the area contained in Excavation Zone 1. Former operations that occurred within the boundaries of Excavation Zone 2 include Tritons manufacturing, the machine shop, the power house, and the R&D Pilot Scale Production (Semi Works). Chemicals used in these areas included triton, ethylene diamine, ethylene oxide, propylene oxide, solvents, waste solvents, lubricants, and many other chemicals at the Semi Works. Soil borings were installed at seven paved locations within or directly adjacent to Excavation Zone 2. The following contaminants were detected in the soil samples at concentrations greater than the respective industrial direct contact RBC: 1,2-dichloropropane (45.3 mg/kg), benzo(a)pyrene (2.59 mg/kg), benzo(b)fluoranthrene (4.31 mg/kg), dibenz(a,h)anthracene (1.18 mg/kg), 4,4'-DDD (36.8 mg/kg), 4,4'-DDE (13.9 mg/kg), and arsenic (190 mg/kg.)

**West Production Area**

The West Production Area is bounded to the north and west by a portion of the former Frankford Creek (Frankford Inlet), which separates the facility from the Frankford Arsenal Business Center, to the south by Brill and Bridge Streets and to the east by Richmond Street and the East Production Area. The 28-acre West Production Area has been further delineated into four distinct areas: P-24 Area, R7F Area, and West Areas 1 and 2. The entire West Production Area is paved except for an approximately one acre parcel of land located in the southwest corner of the property and designated by Rohm and Haas as West Area 2.

P-24 Area

The P-24 Area is distinct from the rest of the West Production Area because of the concentrations of polycyclic aromatic hydrocarbons (PAHs) detected in the soil samples collected during the installation of boring P-24. This area is located within the south central portion of the West Production Area. The following contaminants were detected in the soil sample (0 - 6.5 feet) collected at this location at concentrations greater than the respective industrial direct contact RBC: benzo(a)anthracene (77.7 mg/kg), benzo(a)pyrene (77.7 mg/kg), benzo(b)fluoranthene (107 mg/kg), dibenz(a,h)anthracene (16.5 mg/kg), indeno(1,2,3-cd)pyrene (41.3 mg/kg) and arsenic (20 mg/kg).

R7F Area

The R7F Area is distinguished from the rest of the West Production Area by the concentrations of VOCs in soil samples collected in the vicinity of the R7F Tank Farm located in the southern portion of the West Production Area just north of Brill Street. The soil contamination is not believed to be related to R7F Tank Farm storage activities, but rather to former operations that occurred in the area. The following contaminants were detected in soil samples collected in this area at concentrations greater than the respective industrial direct contact RBC: tetrachloroethene (12.7 mg/kg), bis(2-chloroethyl)ether (60.5 mg/kg) and arsenic (8 mg/kg).

West Area 2

West Area 2 is comprised of the unpaved portion of the West Production Area (with the exception of a few landscaped areas adjacent to buildings. The only soil samples chemically analyzed from West Area 2 were collected during the installation of one soil boring (SB-28). Two samples from this boring were collected at depths of 1 to 3 feet and 10 to 12 feet. While numerous VOCs, semi-VOCs, pesticides and metals were detected, arsenic (5.2 mg/kg) was the only constituent detected above EPA's RBC for industrial direct contact.

West Area 1

West Area 1 includes all of the West Production Area with the exception of the P-24 Area, R7F Area and West Area 2. Activities within West Area 1 have included chemical manufacturing operations, raw material and product storage, wastewater conveyance, and hazardous/non-hazardous waste management. Current manufacturing operations include Ion Exchange Resin and Goal® herbicide production. The following contaminants were detected in soil samples collected in this area at concentrations greater than the respective industrial direct contact RBCs: benzo(b)pyrene (0.841 mg/kg), bis(2-chloroethyl)ether (3.3 mg/kg), bis(2-ethylhexyl)phthalate (211 mg/kg), 4,4'-DDD (287 mg/kg), 4,4'-DDE (8.42 mg/kg), 4,4'-DDT (21.3 mg/kg), and arsenic (310 mg/kg).

**Surface Water**:

The site is bordered to the north by the Frankford Inlet and to the east by the Delaware River, which are both tidally influenced. Frankford Inlet is the former channel of the redirected Frankford Creek. The upper half of the inlet is totally dewatered and the lower half is nearly dewatered at low tide.

Swimming is prohibited in the portion of the Delaware River adjacent to the facility as the river is classified as a Zone 3 water body by the Delaware River Basin Commission (DRBC). No individuals have ever been observed swimming in the site vicinity. No Rohm and Haas operations require its employees to come into contact with surface water. While recreational boating is relatively popular in this section of the river, there is no exposure to surface water associated with this activity.

Non-contact cooling water and stormwater is discharged at two National Pollutant Discharge Elimination System (NPDES) permitted outfalls located along Frankford Inlet and one NPDES permitted outfall located along the Delaware River. These outfalls are sampled and analyzed monthly for 1,2-dichloroethane, 4,4'-DDD, 4,4'-DDE and total suspended solids to ensure that permitted discharge limits are not exceeded.

Contaminated groundwater beneath the facility also discharges into the Frankford Inlet and Delaware River. Historically, 82 constituents have been detected in the groundwater beneath the site, although the majority of these contaminants have been found at concentrations below their associated human health risk based screening criteria.

The Delaware River is used as a source of drinking water by the Philadelphia Water Department (PWD) at its Samuel Baxter Water Treatment Plant located approximately five miles upstream of the facility. This treatment plant provides drinking water to approximately 60% of the residents of Philadelphia as well as some Lower Bucks County residents. Because of the tidal nature of the Delaware River at Philadelphia, it is theoretically possible for contaminants from the site to enter the river via surface runoff and/or groundwater and flow toward the Baxter Plant during high tide events. However, due to the many upstream and downstream industrial facilities lining the Delaware River, it would be virtually impossible to attribute any contamination found in the river at the intake to any facility-related current or historical operations.

To ensure that site-related contamination is not impacting the Delaware River, Rohm and Haas compared the maximum concentrations of the 82 historically detected constituents in groundwater to risk based surface water quality criteria (the Maximum Contaminant Levels (MCLs) where available or calculated risk based concentrations based on a standard dose equation and assumptions). Forty five (45) of the detected groundwater constituents were found to have maximum concentrations below their respective risk based criteria. When adjusting the remaining maximum constituent concentrations by taking the dilution effect of the Delaware River into account, an additional 35 constituents are found to be below the drinking water risk based criteria. The two remaining constituents and their maximum concentrations were 1,2-dichloroethane (80.9 mg/l) and 1,2-dichloropropane (280 mg/l). To address these contaminants, Rohm and Haas used groundwater kriging calculations to estimate the concentrations of these constituents as they enter and are diluted by the Delaware River based on the concentrations observed in the on-site wells. The kriging calculations indicate that the concentrations of these contaminants in the river due to contaminated groundwater migration from the site would be several orders of magnitude below the drinking water risk based criteria.

PADEP has issued the following advisory fo the consumption of fish from the Delaware River both upstream and downstream of the Rohm and Haas facility. White perch, striped bass and carp should be limited to one meal per month due to PCB contamination, channel catfish should be limited to 6 meals per year due to PCB contamination, smallmouth bass should be limited to two meals per month due to mercury contamination, and the American eel should not be consumed due to PCB contamination. Despite this advisory, individuals have been observed on occasion fishing from the Frankford Inlet and Delaware River in the site vicinity, so consumption of fish by local residents is a potential route of exposure to site-specific contamination in surface water that must be evaluated. Using the same methodology utilized to address the drinking water exposure pathway, the maximum concentrations of the 82 historically detected groundwater constituents were compared to risk-based criteria protective of fish ingestion. The maximum groundwater constituent concentrations were lower than the carcinogenic fish ingestion criteria for 60 of the 82 contaminants and were lower than the noncarcinogenic fish ingestion criteria for 73 of the 82 groundwater constituents. When taking the dilution effect of the Delaware River into account, all of the noncarcinogenic fish ingestion criteria were met for the remaining nine constituents and all but three of the remaining constituents were below the carcinogenic fish ingestion criteria. These three constituents and their maximum historic on-site groundwater concentrations were 4,4'-DDD (130 ug/l), 4,4'-DDE (34 ug/l), and 4,4'-DDT (21.2 ug/l). When the kriging calculations are performed for these three contaminants, the predicted surface water concentrations in the river are less that the Human Health water quality criteria for fish consumption at the $10^{-6}$ risk level.

Based on the above, the potential discharge to surface water of 82 constituents historically detected in groundwater is not suspected to have an adverse health effect on individuals that receive their drinking water from the PWD's Baxter Treatment Plant or that fish in the waters adjacent to the facility property.

**Sediment**:

Contaminated groundwater from beneath the facility passes through bottom sediments before discharging into the Frankford Inlet and Delaware River. Due to the number of industrial facilities in the immediate vicinity of Rohm and Haas, though, it is difficult to attribute sediment contamination to the facility. Nonetheless, Frankford Creek sediments were sampled and analyzed for chlorinated pesticides in 1970 and 1971 and two composite samples from Frankford Inlet were collected and analyzed for chlorinated pesticides in 1971. The analytical data indicated that 4,4'-DDD (87.1 mg/kg) and 4,4'-DDE (57.9 mg/kg) were the only constituents detected above their respective PADEP Residential Direct Contact Soil Medium Specific Concentrations (MSCs) in the Frankford Creek samples. No exceedences of the MSCs were observed in the composite samples collected from the Inlet. Five sediment samples were collected from the Delaware River and analyzed for DDT in April 1974. None of the samples analyzed contained DDT above the residential direct contact soil MSC.

**Air (indoor)**

Several contaminants of indoor air quality concern have been detected in soil and groundwater samples collected at the site. To date, no soil gas sampling is known to have occurred at the site, although indoor air sampling of both on-site structures and off-site residences has been conducted historically.

In 1987, Rohm and Haas discovered a groundwater plume emanating from the site and traveling off-site underneath neighboring residences across Bridge Street. In addition to on-site sources of VOC contamination, a 1983 release from an underground storage tank (UST) at a gasoline station at Bridge and Thomson Streets is believed to have contributed to the magnitude of the contamination within the plume. Rohm and Haas conducted indoor air investigations for residents located in the vicinity of Bridge and Thompson Streets in 1994 and 1998 to determine if the volatile contaminants in the plume had an impact on indoor air quality. The results of both studies indicate that there was no statistical evidence of a relationship between the location of the plume and the concentrations of the compounds detected in the air of the residences. There was also no significant difference between the mean concentrations of contaminants found in basement samples compared to first floor samples. The levels of VOCs detected in the neighborhood homes were within the range of typical indoor background levels and are most likely present due to the storage of materials containing VOCs within those residences. As a precaution, Rohm and Haas installed basement ventilation systems in 39 homes located over or directly adjacent to the groundwater plume at the request of the homeowners.

Although EPA's November 2002 Draft Guidance for Evaluating the Indoor Air Pathway from Groundwater and Soils does not recommend soil sampling and analysis for assessing the vapor intrusion pathway, the PADEP January 2004 Final Vapor Intrusion Guidance does allow for the use of soil data to assess this pathway. EPA's guidance recommends using soil gas data rather than soil data because of the uncertainties associated with soil partitioning calculations, variability of spatial soil contamination, and with measuring concentrations of volatile contaminants introduced during soil sampling, preservation and chemical analysis. Nonetheless, a review of the historical soil data associated with the site indicates that the following VOCs have been detected at concentrations above the PADEP derived Johnson and Ettinger Model default screening levels for non-residential soils: carbon disulfide, chlorobenzene, chloroform, 1,2-dichloroethane, 1,2-dichloropropane, ethylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride and total xylenes.

The PADEP guidance allows the usage of screening levels derived from the J&E Model based on OSHA Permissible Exposure Limits (PELs) for facilities where OSHA regulations are fully implemented and documented in a workplace building (such as Rohm and Haas). Comparing the maximum soil concentrations detected on site to the PEL screening levels, carbon disulfide, chloroform, trichloroethene and vinyl chloride are eliminated from the above list of contaminants. Of the remaining seven contaminants only total xylenes have been detected above the PADEP PEL derived screening level in soil samples collected within 100 feet of inhabited on-site buildings. Specifically, total xylenes were detected in soil sample nos. SB-25 (429 mg/kg), SB-28 (560 mg/kg), P-23(437 mg/kg), P-26 (233 mg/kg) and P-27 (275 mg/kg) at levels higher than the PADEP target screening level of 170 mg/kg. Buildings within 100 feet of these sample locations include Bldg. 21, Bldg. 85, Bldg. 87 and Bldg R-9. However, per the PADEP Guidance, the total xylenes contamination can be screened out of the indoor air pathway by comparing the above concentrations to the $MSC_{soil\text{-}gw}$ (1,000 mg/kg).

For the evaluation of the groundwater to indoor air pathway, maximum historical detections of VOCs in groundwater were compared to both EPA and PADEP screening criteria. The following contaminants were detected in groundwater beneath the site at concentrations greater than EPA's Target Groundwater Concentrations corresponding to a risk level of $10^{-5}$ in a residential setting (EPA has not published risk based concentrations for commercial/industrial settings): benzene, carbon disulfide, chlorobenzene, chloroform, 1,2-dichloroethane (1,2-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), 1,2-dichloropropane, ethylbenzene, 4-methyl-2-pentanone, methylene chloride, PCE, toluene, TCE, vinyl chloride and total xylenes. Of the above contaminants, only chlorobenzene, chloroform, 1,2-DCA, and 1,2-dichloropropane were detected at concentrations above PADEP's J&E Model derived default non-residential groundwater screening levels. As in the soil to indoor air pathway, the PADEP Guidance allows the usage of OSHA-derived screening criteria at facilities such as Rohm and Haas, where OSHA regulations are fully implemented. All of the above contaminants can be screened out of the groundwater to indoor air pathway when using PADEP's OSHA-derived screening criteria.

To further examine the potential for a groundwater to indoor air problem, indoor air concentrations were calculated based on the maximum historical VOC concentrations detected on-site and a conservative groundwater to indoor air attenuation factor of 0.01. These calculated indoor air concentrations were then compared to OSHA Permissible Exposure Limits (PELs) for each of the VOC's detected in groundwater. Benzene and vinyl chloride were the only VOCs that had calculated indoor air concentrations greater than their corresponding OSHA PELs (there is no PEL listed for cis-1,2-DCE). For benzene, the maximum groundwater concentration of 0.826 mg/l translates to an indoor air concentration of 0.59 parts per million (ppm) which is greater than the PEL of 0.1 ppm. Similarly for vinyl chloride, the maximum groundwater concentration (0.291 mg/l) translates to an indoor air concentration of 1.26 ppm which is greater than the PEL of 1.0 ppm. However, there were no detections of benzene or vinyl chloride in groundwater within 100 feet of an inhabited building that would cause an exceedance of either indoor air PEL based on an attenuation factor of 0.01.

Based on the above, the air inside any inhabited on-site structures or off-site residences is not suspected to be contaminated above appropriately protective risk-based levels due to vapor intrusion from groundwater or soils beneath the site.

**Air (Outdoor)**

Outdoor air is not suspected to be contaminated by site-related activities above EPA risk-based levels. Off-site outdoor air sampling has been conducted at various times during the late 1980s and 1990s. In 1993, a 12-month Community Air Monitoring Program was instituted in cooperation with the City of Philadelphia's

Air Management Services. No analytes of concern were detected in outdoor air at concentrations above local or state ambient standards for air toxins during that study. Outdoor air samples were collected in 1987, 1993, 1994 and 1998 as part of the indoor air quality studies being conducted for residences in the Bridge Street vicinity. The results of these outdoor air samples were consistent with the data collected as part of the 1993 Community Air Monitoring Program. While several volatile organic compounds were detected in the ambient air, including acetone, toluene, xylenes, benzene, 2-butanone, chloromethane, methylene chloride, vinyl acetate, cis-1,2-dichloroethene and 1,1,1-trichloroethane, none of these contaminants were found at concentrations above the applicable Ambient Air Quality Guidelines.

In a Human Health and Ecological Risk Assessment completed in 1998, Rohm and Haas evaluated the exposure concentrations in ambient air resulting from potential vapor and particulate emissions from surface soil in currently or potentially unpaved areas and from vapor emissions from exposed groundwater during excavations into shallow groundwater, based on mathematical models in combination with actual soil and groundwater data. The risk assessment concluded that the risks to human health associated with all current operations are below the levels established as protective under PADEP and EPA policy. The study found that the cumulative cancer risk and hazard index (HI) associated with workers performing future excavation work in Excavation Zone 1 without wearing the proper personal protective equipment (PPE) exceed levels established by PADEP and EPA for the protection of human health. The elevated cumulative cancer risk in this area is due primarily to the concentrations of 1,2-dichloropropane, 4,4'-DDD, 4,4'-DDT and 1,2-dichloroethane detected in soils. The elevated HI in Excavation Zone 1 is due primarily to the detected concentrations of 1,2-dichloropropane and chlorobenzene in groundwater. For Excavation Zone 2 and West Area 1, the high-end estimates of potential cumulative risk and HI exceeded PADEP and EPA acceptable levels only when extrapolated inhalation toxicity values were used in calculating the estimates. Rohm and Haas' current practices require the use of appropriate PPE by excavation workers and the company has no intention to change the practice of PPE use on-site. Therefore, workers have been and will continue to be adequately protected from potential exposures during future excavation activities.

Ref.: Sampling and Analysis Plan, East Production Area, Rohm and Haas Delaware Valley Inc., Philadelphia Plant, Prepared by Woodward-Clyde, March 1995; Description of Current Conditions Report, East Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, March 1995; Remedial Investigation Report, East Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, April 30, 1996; Description of Current Conditions Report, West Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, May 14, 1997; Remedial Investigation Report, West Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, May 28, 1998; Remedial Investigation Report - Volume 2, Human Health and Ecological Risk Assessment, Rohm and Haas Company, Philadelphia Plant, Prepared by Environ Corp., May 1998; Summary Report of Weston Investigations for Bridesburg Neighborhood, prepared by Roy F. Weston, Inc. June 17, 1998; Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, USEPA, November 2002; Land Recycling Program Technical Guidance Manual - Section IV.A.4. Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard, January 24, 2004; 2003 Groundwater Monitoring Report, prepared by URS Corp., March 2004; Update on Philadelphia Plant Groundwater Report, prepared by Rohm and Haas, December 2004.

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

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.

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

**Rationale and Reference(s):**

**Groundwater**

As described in the Groundwater section of Question No. 2 above, several VOCs, semi-VOCs, pesticides and inorganic constituents have been detected at elevated concentrations in various groundwater sampling events that have occurred at the facility over the since the groundwater monitoring program was initiated at the site in 1984.

Active groundwater remediation is occurring in the vicinity of the contaminated plume that has traveled beneath several residences on the south side of Bridge Street. The most prevalent contaminants in the plume are ethylbenzene, toluene and xylene. Rohm and Haas installed a well recovery system in 1994, a soil vapor extraction system in 1996 and a 250-foot groundwater recovery trench in 1998. A chronological look at the plume shows that plume has been steadily shrinking in size and Rohm and Haas estimates it will reach its goal of 1 ppm of total VOCs in groundwater beneath the residences in about 17 years with the current system.

There are no known groundwater springs located on the site property. While there are many monitoring wells on the site property, production wells are not used to supply water to any of the manufacturing processes at the plant and there are no potable wells on the property. The local drinking water supply is unaffected by the groundwater contamination associated with the site as the facility and residents in the area rely on public water from the Philadelphia Water Department for their potable water supply. PWD obtains its supply from intakes on the Delaware River five miles upstream of the facility.

There are currently approximately 60 workers at the site, which is well below the several hundred workers employed there at the peak of its operations. A few of these workers may be exposed to groundwater through the regular monitoring and maintenance of the groundwater management system and construction workers could potentially be exposed to groundwater during excavation activities periodically required for the maintenance of underground utilities. Any workers involved with further site characterization, remediation or construction will be properly trained and equipped with personal protective equipment (PPE) to prevent potential exposures to contaminated groundwater.

**Surface and Subsurface Soil**:

No site-related soil contamination is known to exist outside the property boundary. Rohm and Haas maintains fencing and 24-hour security at the facility to prevent trespassers from accessing the site. There are no day-care facilities located on-site. The property has no areas designated for recreational use and none of the property is used for agricultural purposes.

Most of the surface area of the facility is paved. The pathways associated with surface soil and subsurface soil for non-intrusive activities (typical plant workers/site visitors) are considered incomplete. As described in the groundwater section above, construction workers coming into contact with contaminated surface and subsurface soils during excavation activities are equipped with the proper PPE, as required by Rohm and Haas, thereby eliminating this exposure pathway.

**Sediment**

There is no direct exposure pathway for individuals to come into contact with potentially contaminated sediments. No Rohm and Haas operations require its employees to come into contact with the sediments of the river or Frankford Inlet. None of the shoreline along the Frankford Inlet or Delaware River on the site property has a recreational use. As described in the surface water section of Question No. 2 above, swimming is prohibited in the portion of the river near the site. PADEP has issued advisories for the consumption of fish from the Delaware River both upstream and downstream of the Rohm and Haas facility.

Ref.: Sampling and Analysis Plan, East Production Area, Rohm and Haas Delaware Valley Inc., Philadelphia Plant, Prepared by Woodward-Clyde, March 1995; Description of Current Conditions Report, East Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, March 1995; Remedial Investigation Report, East Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, April 30, 1996; Description of Current Conditions Report, West Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, May 14, 19976; Remedial Investigation Report, West Production Area, Rohm and Haas Company, Philadelphia Plant, Prepared by Woodward-Clyde, May 28, 1998; Remedial Investigation Report - Volume 2, Human Health and Ecological Risk Assessment, Rohm and Haas Company, Philadelphia Plant, Prepared by Environ Corp., May 1998; Summary Report of Weston Investigations for Bridesburg Neighborhood, prepared by Roy F. Weston, Inc. June 17, 1998; Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, USEPA, November 2002; Land Recycling Program Technical Guidance Manual - Section IV.A.4. Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard, January 24, 2004; 2003 Groundwater Monitoring Report, prepared by URS Corp., March 2004; Update on Philadelphia Plant Groundwater Report, prepared by Rohm and Haas, December 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.

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 Rohm and Haas Company - Philadelphia Plant, EPA ID # PAD 077 883 346 , located at 5000 Richmond Street, Philadelphia, PA 19137 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) | /s/ | Date 6/7/05 |
| | (print) | Andrew Clibanoff | |
| | (title) | RCRA Project Manager | |

| | | | |
|---|---|---|---|
| Supervisor | (signature) | /s/ | Date 6/7/05 |
| | (print) | Paul Gotthold | |
| | (title) | Chief, PA operations Branch | |
| | (EPA Region or State) | EPA Region III | |

**Locations where References may be found:**

EPA Region III
Waste and Chemicals Management Division
1650 Arch Street
Philadelphia, PA 19103-2029

**Contact telephone and e-mail numbers:**

| | |
|---|---|
| (name) | Andrew Clibanoff |
| (phone #) | 215-814-3391 |
| (e-mail) | clibanoff.andrew@epa.gov |

**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.**