DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name:	**Solvay Solexis, Inc. (formerly Ausimont, USA, Inc.)**
Facility Address:	**10 Leonards Lane, Thorofare, New Jersey, 08086**
Facility EPA ID#:	**NJD980753875**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) to track changes in the quality of the environment. The two EIs 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 EIs 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 Determination status codes should remain in the Resource Conservation and Recovery Information System (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 Information

The Solvay Solexis, Inc., facility is located on approximately 243 flat-lying acres at the northwest corner of Crown Point Road (Route 44) and Leonards Lane in Thorofare, Gloucester County, New Jersey. The site is bordered by grassy areas, tidal marshes, and the Delaware River to the north, the Pennsylvania Reading Seashore Railroad to the south, and woodlands to the east and west. Numerous streams exist in

the vicinity of the site that discharge to the Delaware River, including Little Mantua Creek and Main Ditch.

Pennwalt Corporation commenced operations at the site in 1970, manufacturing chlorinated fluorocarbon propellants and refrigerants until 1977 when the demand for these products declined. Between 1983 and 1985, Pennwalt constructed a new manufacturing facility to produce a polyvinylidene fluoride resin marketed under the trade name of "Kynar" and an associated hydrochlorofuorocarbon gas. Kynar is used as a noncorrosive durable coating on pipes, and computer and telephone wire conduits. Most of the industrial plastics and coating manufacturing operations occur in the southern portion of the site, encompassing eight buildings, various process and manufacturing areas, aboveground storage tanks, and overhead piping. The facility operated an on-site wastewater treatment plant and a Resource Conservation and Recovery Act (RCRA) permitted incinerator.

As a result of corporate reorganization at the end of 1989, Pennwalt Corporation became Elf Atochem North America, Inc. In October 1991, Elf Atochem sold the operation to Ausimont. In March 2003, Ausimont USA changed its name to Solvay Solexis, Inc. This was solely an administrative and informational change and not a change in ownership. Chlorofluorocarbons are still being manufactured at the site to date. Both Elf Atochem and Solvay Solexis used chlorinated solvents in the manufacturing process.

The site became subject to RCRA Corrective Action in April 1989 when Pennwalt Corporation received its final Hazardous and Solid Waste Amendment (HSWA) Permit for operation of a hazardous waste incinerator. The facility also became subject to New Jersey Department of Environmental Protection's (NJDEP's) Environmental Cleanup Responsibility Act (ECRA) in 1989. Groundwater investigation and monitoring activities are ongoing to date, and 17 new monitoring wells have been installed in the active portion of the facility since October 2000 to study volatile organic compound (VOC) contamination in groundwater. Remedial actions being considered for soil and groundwater contamination at the site include in-situ air sparging (IAS) and soil vapor extraction (SVE), institutional controls (e.g., establishing a Groundwater Classification Exception Areas (CEAs) and implementing a deed notice, with engineering controls), and a monitored natural attenuation program.

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

Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs): A total of 16 SWMUs were identified in the June 1989 Draft RCRA Facility Investigation (RFI), Task 1 Report, four of which (SWMUs 1 through 4) are active or permitted in accordance with the HSWA Permit. With the exception of the four permitted SWMUs, all SWMUs were investigated in the November 1992 Draft RFI Phase I Report. Additionally, in June and July 1990, 27 areas were targeted for investigation under the ECRA program. The following provides a brief description of each SWMU or ECRA area under investigation. A facility map depicting the SWMUs and areas of investigation is provided as Plate 1 in the RCRA Facility Investigation Task 5, Draft RFI Phase I Report (Ref. 4).

SWMU 1, RCRA Regulated Incinerator System: The incinerator, permitted in 1989, burns wastes from the production of Kynar and Isotron. None of the waste streams are listed as hazardous waste, but are classified due to their reactivity, toxicity, and ignitability. The incinerator is designed to accept both liquid and gaseous wastes. This unit is regulated under a RCRA hazardous waste facility permit. No releases to the environment requiring corrective action have been identified.

SWMU 2, Container Storage Area: This SWMU consists of a bermed concrete pad located adjacent to and directly south of the incinerator unit. This pad is used for on-site storage of hazardous waste (e.g., waste oil, spent batteries, methylene chloride, lab waste, and methanol) and can store up to 200 drums. Wastes accumulated in this area are held for less than 90 days and therefore, the unit does not require permitting under RCRA. This unit was not identified in the RCRA Facility Assessment (RFA) as requiring further investigations with respect to the corrective action provisions of the 1984 HSWA permit.

SWMU 3, Inorganic Wastewater Treatment System/ SWMU 4, Organic Wastewater Treatment System: The inorganic wastewater treatment system is located immediately west of the incinerator. There are five inorganic waste streams that consist of the polymer plant collection sump, an equalization tank, and a neutralization tank. Materials used in the wastewater treatment include lime, liquid polymer, and hydrochloric acid. The organic wastewater treatment system is located in the north area of the developed site. Process wastewater from six process areas are treated and subsequently discharged to the Gloucester County Utilities Authority. Samples of the wastewater indicate the presence of five VOCs including carbon tetrachloride, chloroform, methylene chloride, tetrachloroethylene, and trichlorofluoromethane. These units were not identified in the RFA as requiring further investigations with respect to the corrective action provisions of the HSWA permit.

SWMUs 5/6, Two Former Neutralization Pits and Inlet Sump: This unit was utilized from 1970 - 1977 during the initial operations of the facility. Process wastewaters from the production of Isotron 11 and Isotron 12 were discharged to the neutralization system (consisting of two neutralization pits) through the neutralization pit inlet sump. These wastewaters were characterized by variable pH, excessive quantities of fluoride and chlorides compounds, and other possible constituents including carbon tetrachloride, chlorinated fluorocarbons, and arsenic and antimony compounds. In 1984, the inlet sump and pits were demolished in place and backfilled. Soil samples indicated elevated levels of fluoride and antimony above New Jersey Residential Direct Contact Soil Cleanup Criteria (RDCSCC) but below New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC). Therefore no further action is required at this site given its current use as an industrial property. A draft deed notice was submitted to NJDEP in May 2002 to indicate that antimony remains at one location above NJ RDCSCC. In addition, semiannual inspections will be conducted to ensure the use and conditions of this area remain the same (Ref. 11).

SWMUs 7/8/9, Dredge Spoils Area (Two Former Settling Lagoons, Retention Pond, and Two Former Waste Piles): This area encompasses approximately 35.6 acres adjacent to the Delaware River. The two former settling lagoons received wastewater from the neutralization pits, with total capacity of 600,000 gallons. Solids, principally calcium fluoride, settled out and accumulated in the lagoons. The retention pond received process wastewater from the settling lagoons in addition to other effluent wastewater. Discharge from this pond to the Delaware River occurred via an outfall regulated by an NJ Pollutant Discharge Elimination System (NJPDES) permit. The two former waste piles held a variety of solid waste materials, including drums, packing materials and other miscellaneous materials. In 1983, samples collected from the waste pile indicated that the material was primarily activated alumina, antimony, and other non-hazardous constituents, so the contents were classified as non-hazardous and removed for off-site disposal. The settling lagoons were tested in 1984 and analytical results indicated that they did not pose a threat to local groundwater quality, so they were subsequently backfilled along with the retention pond. Soil samples indicated elevated levels of lead, beryllium, and arsenic above the NJ NRDCSCC. Additional soil and groundwater investigations were required by NJDEP (Ref. 6). Solvay Solexis submitted an addendum to the Remedial Investigation Report (October 2000) discussing the fact that lead exceeded the NJ NRDCSCC in one sample location at a depth of 9 - 10 feet below ground surface (bgs), which would limit exposures, and requesting permission to perform compliance averaging for beryllium which, when performed, is below the NJ NRDCSCC. NJDEP determined Solvay Solexis's approach for lead and beryllium were acceptable. NJDEP also required that Solvay Solexis depict all arsenic concentrations and depths within the top two feet of soil on a site map to display the extent of contamination. Solvay Solexis provided this information and concluded that the arsenic concentration ranges and averages between SWMUs 7/8/9 and the dredge spoils area are approximately equal, thereby demonstrating that arsenic in the SWMUs is a result of dredged materials (Ref. 8). Solvay Solexis proposed to install engineering controls (soil cap) in areas where surficial arsenic concentrations remain high and NJDEP has accepted this proposal (Ref. 9). A draft deed notice was submitted to NJDEP in May 2002 outlining all areas of residual arsenic and beryllium contamination above NJ RDCSCC (Ref. 10). A soil cap consisting of two feet of vegetated clean fill soil is currently in place. In addition, access to this area is restricted by fencing and signage. Solvay Solexis will perform semiannual inspections to ensure that the use and conditions at this area remain the same (Ref. 10).

SWMUs 10/11, Kynar Polymer Release Area and Stormwater Drainage Ditch: In 1986, NJDEP and the NJ Department of Fish, Game and Wildlife inspected this area in response to a reported spill of Kynar resin. Soil samples were obtained and results indicated that the Kynar resin and soils were non-hazardous. All spilled material and impacted soils were excavated and disposed off site. No further action was recommended at this site (Ref. 6).

SWMU 12, Inactive Septic Tanks and Tile Field: The septic tank/leach field system was utilized in the early 1970's prior to the hookup with Gloucester County Utilities Authority Treatment Plant. Reportedly, only sanitary wastes were discharged to this system; however, it has not been determined if lab wastes were also discharged to the septic tanks. Results from soil sampling indicates that the septic tanks have not impacted the surrounding soils. No further action was recommended at this site (Ref. 6).

SWMU 13, Vegetation Area: During the RFA site visit, an isolated patch of vegetation was observed on the bank of the Delaware River near the facility's NJPDES outfall. Air monitoring indicated that soils in this area contained detectable concentrations of organic vapors other than methane. One soil sample was obtained and results indicated that the presence of semi-volatiles was not due to a release of contaminants from facility operations. No further action was recommended at this site (Ref. 6).

In summary, based on the results of the November 1992 Draft RFI, NJDEP concluded that all SWMUs, with the exception of SWMUs 5/6 and 7/8/9, required no further action. A deed notice was submitted in May 2002 that delineates the location, depth, and concentration of contaminants exceeding NJ RDCSCC at SWMUs 5/6 and SWMUs 7/8/9. In addition, the deed notice includes the use of institutional controls (vegetative cover), and restricted access by fencing and signage for SWMUs 7/8/9 (Refs. 10, 11).

Under the ECRA program, 27 areas were targeted for investigation. Investigations began in June/July 1990, and sampling and excavation activities continued through March 1992, when final cleanup and implementation of institutional controls occurred. To briefly summarize, 20 out of the 27 ECRA sites were determined to be no further action in a letter from NJDEP dated March 5, 1991 (Ref. 3). Additional sampling was performed in 1991 to further delineate soils at the seven outstanding areas. In a letter dated January 21, 1992, NJDEP concurred that no further actions were required at four of the seven areas, with two of the four no further action areas requiring institutional controls (Areas 3A and 7A) (Ref. 5). The three remaining areas required additional sampling and investigation after 1992 and were determined to be no further action. The two areas that required institutional controls are discussed below.

Area 3A, Former Operations Area: Results of sampling demonstrated antimony levels in excess of NJ RDCSCC but below NJ NRDCSCC criteria. A site-specific cleanup standard of 31 mg/kg was approved by NJDEP in August 1998. There was one sample, SB-13B that exceeded the site-specific criterion (180 mg/kg). NJDEP required that this area be included in the deed notice. A deed notice was submitted in May 2002 to indicate that antimony remains at two sample locations above the NJ RDCSCC. The deed notice depicts the exact location, depth, and concentration of antimony in excess of NJ RDCSCC. The facility maintains a fence and 24 hour security to restrict unauthorized access. In addition, semiannual inspections are conducted to ensure that the use and condition of this area remain the same (Ref. 11).

Area 7A, Monomer Furnace Area: Nickel was detected in excess of NJ NRDCSCC. The top one foot of surface soil was removed and a concrete pad was installed as part of the cleanup plan. NJDEP determined this was acceptable provided a vertical clean zone was established beneath

the contaminated areas. Solvay Solexis established a vertical clean zone. In addition, a deed notice was submitted in May 2002 to indicate that nickel remains at two sample locations above the NJ RDCSCC (but below the NJ NRDCSCC) beneath a curbed concrete pad. The facility maintains a fence and 24-hour security to restrict unauthorized access. Semiannual inspections will also be conducted to ensure that the use and condition of this area remain the same (Ref. 11).

In addition, NJDEP required an investigation of the nature, extent, and potential sources of VOCs detected in groundwater in the southern portion of the site. Results of the soil and groundwater investigations for those areas requiring additional investigations are outlined in the response to Question No. 2.

References:

1. Notice of Issuance of a Final HSWA Permit from USEPA Region 2, March 23, 1989.
2. RCRA Facility Investigation Task I, Description of Current Conditions, prepared by Fred C. Hart Associates, June 1989.
3. Letter from Dawn Pompeo, NJDEP, to Peter Sacripanti, Shearman and Sterling, Re: Pennwalt Corporation, March 5, 1991.
4. RCRA Facility Investigation Task 5, Draft RFI Phase I Report, prepared by McLaren/Hart Environmental, February 28, 1992.
5. Cleanup Plan Implementation Report for Elf Atochem North America, Prepared by McLaren/Hart Environmental Engineering Corp. November 6, 1992.
6. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf Atochem, Re: Pennwalt Corporation, March 17, 1994.
7. Remedial Investigation Report Addendum Including AOC 3A, AOC 7A, SWMU 5/6 and Dredge Spoils Area, prepared by ENSR Corporation, October 2000.
8. Letter from Virginia Hubert, Ausimont Inc. to Mr. Richard Burgos, NJDEP, Re: Ausimont USA, Inc. Dredge Spoils Area, June 14, 2001.
9. Letter from NJDEP to Virginia Hubert, Ausimont, Re: Hydropunch Groundwater and Soil Investigation Report, April 02, 2002.
10. Letter from Virginia Hubert, Ausimont, to Mr. Richard Burgos, NJDEP, Re: Dredge Spoils Area, May 17, 2002.
11. Letter from Virginia Hubert, Ausimont, to Mr. Richard Burgos, NJDEP, Re: Plant Area, May 17, 2002.

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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			metals, VOCs
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)	X			metals
Surface Water	X			metals
Sediment	X			metals
Subsurface Soil (e.g., >2 ft)	X			metals
Air (Outdoor)		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:

Groundwater

The Solvay Solexis site is underlain by the Potomac-Raritan-Magothy (PRM) aquifer system, which is comprised of three distinct aquifer units separated by two silty/clayey confining units. The PRM aquifer system is confined at its base by the crystalline basement rock of the Wissahickon Formation. The site is largely located within the recharge area of the upper aquifer. Groundwater in the upper aquifer is

[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) suggests 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.

typically encountered within 15 to 20 feet bgs (Ref. 2). The upper aquifer is approximately 75 feet thick in the vicinity of the site, with an underlying confining bed approximately 50 feet thick (Ref. 12).

Because the Solvay Solexis site is located adjacent to the Delaware River, tidal influences are of potential concern. In the vicinity of Gloucester County, the Delaware River has a strong tidal influence, with a tidal rise and fall of approximately 1.5 feet in a shallow groundwater monitoring well in the northern portion of the site adjacent to the river, and less than 0.5 feet in a shallow groundwater monitoring well in the southern portion of the site adjacent to the main plant area.

Groundwater flow in the shallow water table aquifer beneath the site is divided. The majority of flow is generally toward the south. Heavy groundwater withdrawal in the PRM aquifers from wellfields in Camden, New Jersey, has effectively reversed the natural shallow groundwater flow toward the Delaware River, with flow now moving south and away from the Delaware River (Ref. 2).

There are two areas of the site where groundwater contamination is present. These areas include the dredge spoils area and an area in the active portion of the facility known as the VOC area. Within the dredge spoils area at the north edge of the site, unconfined groundwater generally flows northerly and easterly toward the Delaware River.

Dredge Spoils Area

The dredge spoils area extends approximately 1,700 feet into the Delaware River, covering approximately 37 acres with an average thickness of six feet. Depth to groundwater within the dredge spoils area is approximately 12 to 14 feet bgs.

An area of metals contamination has been identified beneath a portion of the filled dredge spoils area at the north end of the site near the SWMU 7/8/9 cluster. Recent groundwater sampling results from February 2000, which are presented in the October 2000 Remedial Investigation Addendum (not yet approved by NJDEP or reviewed by EPA), were compared to the higher of either the NJ Ground Water Quality Criteria (GWQC) or the Practical Quantitation Level (PQL) for Class II-A potable groundwater. Constituents and their maximum detected concentrations in groundwater samples are provided below in Table 1.

Table 1 - Maximum Concentrations of Constituents Detected in Groundwater in the Dredge Spoils Area

Constituent	NJ GWQC	Maximum Concentration (µg/L)
Antimony	20	111
Cadmium	4	106
Lead	10	33.1

(Ref. 12)

Aluminum, iron, and manganese also exceeded the NJ GWQC, but are not of primary concern because they are not on the Priority Pollutant List and are naturally occurring. Both dissolved iron and manganese are typically found in shallow groundwater in many areas of New Jersey's Coastal Plain, and aluminum is found in most clay minerals common to the Coastal Plain. It should also be noted that

historical sampling results from April 1995 show arsenic concentrations (17.4 µg/L) above the NJ GWQC of 8.0 µg/L; data from February 2000, however, included no arsenic exceedances.

Although there had also been some initial concern regarding VOC contamination beneath the SWMU 7/8/9 cluster, this issue has been resolved. Analytical results obtained during Phase II of the RFI indicated the presence of carbon tetrachloride, 1,1,1-trichloroethane (TCA), methylene chloride, and chloroform in the wells surrounding SWMU 7/8/9 (Ref. 7). However, several additional rounds of sampling and analysis were subsequently conducted, during which VOCs were not detected above NJ GWQC. Consequently, NJDEP has issued a No Further Action decision for VOCs in the groundwater beneath SWMU 7/8/9 and the dredge spoils area (Ref. 9).

VOC Area

An area of contamination consisting of chlorinated volatile organic compounds (CVOCs) has been identified in the southern portion of the facility where active manufacturing occurs. In this area, groundwater flow is generally towards the south-southeast with a shallow gradient (ranging from approximately 0.001 to 0.0017 ft/ft). Groundwater sampling results from 2000 and 2001 indicate the presence of CVOCs above NJ GWQC (Ref. 15). Maximum detected concentrations from the two most recent sampling events (November 2000 and November 2001) are provided below in Table 2.

Table 2 - Maximum Concentration of Groundwater Contaminants in the VOC Area (g/L)

Contaminant	NJ GWQC	Max. Conc. (11/00)	Well Reporting Maximum	Max. Conc. (11/01)	Well Reporting Maximum
1,1-dichloroethane (1,1-DCA)	70	137	MW-5D	90.3	MW-1D
1,2-dichloroethane (1,2-DCA)	2	106	MW-5DD	74.4	MW-5DD
1,1-dichloroethene (1,1-DCE)	2	15,200	WCC6	21,800	MW-16I
1,1,1-TCA	30	2,030	WCC6	52,100	MW-13S
Benzene	1	1.9	M/H-1D	ND	NA
Chloroform	6	42.7	MW-10I	138	MW-5DD
Carbon Tetrachloride	2	885	MW-10I	1,070	MW-10S
Methylene Chloride	2	6.7	MW-3D	2.6	MW-10I
Trichloroethene (TCE)	1	1.3	MW-5DD	10.0	MW-16I
Tetrachloroethene (PCE)	1	1.2	MW-10I	4.3	MW-12S

(Ref. 15)

An analysis of CVOC concentrations in groundwater indicates that the area of impact is comprised of two co-mingled plumes extending through both shallow and deep groundwater zones. One of the plumes consists of carbon tetrachloride, chloroform, and related organic compounds. The second plume consists of a wider variety of CVOCs (including TCA, 1,1-DCE, 1,1-DCA, 1,2-DCA, TCE, and PCE) and several tentatively identified volatile organics. Figures 5 through 12 of the November 2001 VOC Area

Groundwater Sampling Event Report (Ref. 15) highlight the most recent contaminant concentrations and show the estimated extent of NJ GWQC exceedances in the CVOC plumes. Impacts to shallow, intermediate, and deep groundwater are indicated at the Solvay Solexis site.

Air (Indoors)

Groundwater contamination in the dredge spoils area consists of metals while groundwater contamination in the VOC area consists primarily of CVOCs. The maximum concentrations of VOCs detected in shallow groundwater from the most recent round of sampling (November 2001) were compared to the State of Connecticut Groundwater Standards for Protection of Indoor Air under the Industrial/Commercial (CT I/C VC) scenario to identify constituents that may be a concern due to potential migration into indoor air. Table 3 displays the maximum detected concentration along with its respective CT I/C VC.

Table 3 - Maximum Concentrations Detected in Shallow Groundwater in the VOC Area Compared with the CT I/C VC

Contaminant	CT I/C VC (g/L)	Max. Conc. in 11/01 (g/L)*
Acetone	50,000	33.1
1,1-DCA	50,000	3.0
1,1-DCE	6	**14,400**
Chloroform	710	31.9
Carbon Tetrachloride	40	**387**
Methylene Chloride	50,000	0.89
PCE	3,820	4.3
TCA	50,000	**52,100**
TCE	540	2.8

* **Bold** indicates an exceedence

In September 2002, Solvay Solexis performed a similar screening but conservatively evaluated maximum detected constituents from **all** available shallow groundwater data from December 1992 through November 2001 using screening levels from various states, including Connecticut, Pennsylvania, and Michigan (Ref. 17). Four contaminants including 1,1-DCE, 1,1,1-TCA, chloroform, and carbon tetrachloride exceeded one or more of the criteria. Solvay Solexis then applied the Johnson-Ettinger model to calculate the incremental risk value (IRV) hazard quotient (HQ) associated with the potential migration of contaminants via volatilization into indoor air. Site specific parameters were used to calculate quantitative risk estimates in conjunction with EPA default values. Site-specific parameters include the building exchange rate of 2.83E+6 cm^3/s (versus the default rate of 5.63E+4 cm^3/s), depth to groundwater of 508.1 cm (plume area) and 521.21 cm (mid-plume area), and average soil/groundwater temperature of 13.89 degrees Celsius, with a sand soil type. In addition, the updated toxicity value for the reference concentration for 1,1-DCE was applied. Solvay Solexis's results are shown in Table 4.

Table 4 - Solvay Solexis Calculated Incremental Risk Values and Hazard Quotients

Constituent	Concentration (g/L)	Calculated IRV	HQ
Mid-Plume Area			
1,1-DCE	36.1	N/A	0.0015
Carbon Tetrachloride	50.9	2.2E-06	N/A
Chloroform	31.9	3.4E-07	0.14
Cumulative Risk		**2.5E-06**	**0.14**
Plant Area			
1,1-DCE	15,200	N/A	0.013
TCA	52,100	N/A	0.0048
Cumulative Risk			**0.02**

(Ref. 17)

Based on this analysis, inhalation of volatiles in indoor air is not a concern at this site.

In order to confirm Solvay Solexis' results, confirmatory modeling was performed using the most recent **maximum** detected concentrations in groundwater (as shown in Table 3) that exceeded CT I/C VC in conjunction with the Johnson-Ettinger default building exchange rate (5.63E+6 cm^3/s). Results confirmed that there are no unacceptable risks due to inhalation of volatiles emanating from groundwater at the site.

Surface/Subsurface Soil

The Solvay Solexis site consists of fine sands and interbedded clays of the Cretaceous Potomac and Magothy Formations. The northern end of the property (outside of the main plant area) has been filled with silt, sand, and gravel from the Mantua Creek and the Delaware River at various times between 1911 and 1970 (Ref. 13).

Due to the current industrial use of the property, detected soil concentrations were compared to the NJ NRDCSCC. Constituents in soil exceeding the NJ NRDCSCC exist at SWMU 7/8/9.

SWMU 7/8/9, Dredge Spoils Area

The following are the contaminants of concern in surface/subsurface soil in SWMU 7/8/9:

Arsenic: Maximum detected concentration of 45.6 mg/kg. The NJ NRDCSCC is 20 mg/kg based on natural background concentrations. Arsenic concentrations generally decrease with depth, and were primarily detected above the NJ NRDCSCC value within the upper eight feet of material. NJDEP states that developing an alternate non-residential soil cleanup criterion for arsenic would not be appropriate, because the criterion is based on background. In addition, NJDEP does not permit

compliance averaging for soil samples contaminated with arsenic. Thus, arsenic remains of concern in this area.

Beryllium: Maximum detected concentration of 3.8 mg/kg. Beryllium concentrations exceeded the NJ NRDCSCC value (1 mg/kg) in the 0 to 1 ft bgs, 4 to 4.5 ft bgs, and 7 to 8 ft bgs range. However, NJDEP approved compliance averaging for beryllium based on the homogeneity and widespread extent of the dredge fill deposits. Using compliance averaging, the beryllium concentration is 1.96 mg/kg. Thus, remaining beryllium exceedences of the NJDEP approved compliance average occurs in the 4 to 4.5 ft and 7 to 8 ft range.

Lead: Maximum detected concentration of 1,170 mg/kg. The NJ NRDCSCC value for lead is 600 mg/kg. All lead concentrations are below 600 mg/kg with the exception of one sample at location at a depth of 9 to 10 ft bgs. This detected concentration, when compliance averaged with other concentrations from this sampling interval, is 149.2 mg/kg, which is below the NJ NRDCSCC.

Surface Water/Sediment

One surface water sample was obtained from the Delaware River and analyzed for total metals in 1996. Detected concentrations were evaluated in comparison to the NJ Surface Water Quality Criteria (NJ SWQC) and the Federal Ambient Water Quality Criteria (AWQC) for human health and organisms. None of the detected constituents exceeded either criteria. Although no sediment samples were obtained from the Delaware River, it can be assumed that the constituents in sediment would be similar to those detected in surface water and groundwater.

Maximum detected concentrations of constituents in shallow groundwater from monitoring wells located in the most downgradient point adjacent to the Delaware River were compared to ten times the NJ GWQC and/or the NJ SWQC for saline estuary and saline coastal waterways (SE, SC). These wells and piezometers include PZ-3, PZ-5, PZ-6, and P-3S/I/D. The most recent sampling data (February 18, 2000) detected only metals in these sample locations, including: lead (33.1 µg/L), antimony (111 µg/L), and cadmium (106 µg/L). In comparing to ten times the NJ GWQC (lead=100 µg/L; antimony=200 µg/L; cadmium=40 µg/L), only cadmium exceeds its respective criterion. Antimony (4,300 µg/L) is the only detected contaminant with an available NJ SWQC for SE/SC waterways, and the detected concentration is well below this criterion. Thus, it appears that cadmium could potentially discharge to the Delaware River at elevated levels given the most recently detected concentrations located upgradient of the river.

In addition, there is an intermittent freshwater drainage ditch located in the southeastern part of the site that runs adjacent to the rail line. It does not appear that the ditch has been adversely impacted by groundwater contamination. The shallow groundwater plume of contaminants above NJ GWQC is currently located entirely side-gradient to the ditch. With groundwater flow to the south-southeast, continued migration of the plume would be parallel to rather than towards the ditch. Furthermore, groundwater contour lines do not appear to be deflected in the immediate vicinity of the ditch, suggesting that there is no significant interaction between the ditch and underlying groundwater. Thus, it does not appear that shallow groundwater discharges to the ditch.

Air (Outdoors)

There is no reason to believe outdoor air has been contaminated based upon the nature of contamination in soil at the site (i.e., metals). In addition, since volatilization of CVOCs in groundwater are not a concern for exposures in indoor air, it is not likely that inhalation of volatiles in outdoor air would be of concern.

References:

1. Phase IA Soil Contaminant Characterization Report, prepared by McLaren/Hart, July, 1991.
2. Summary Report on the Limited Hydrogeological Investigation at Ausimont USA, Inc., prepared by Hale and Dorr, February, 1993.
3. Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atohem, Re: Pennwalt/Atochem, March 17, 1994.
4. Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atochem, Re: Pennwalt/Atochem, June 9, 1995.
5. Interim Report, Completion of RFI-Related Activities at SWMU 5/6 and SWMU 7/8/9, McLaren/Hart Environmental, September, 1995.
6. Report No. 2 of Groundwater and Soil Investigations at the Elf Atochem Former Thorofare, New Jersey Facility, prepared by McLaren/Hart Environmental Engineering Corporation, March 29, 1996.
7. Letter from Raymond Basso, EPA, to John Graham, NJDEP, Re: Groundwater and Soil Investigation Report #2, October 29, 1996.
8. Letter from Gary Shelby and Virginia Hubert, Elf Atochem, to Rosemary Lafferty, NJDEP, March 4, 1997.
9. Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, August 1, 1997.
10. Ausimont Work Plan No. 3, December 15, 1997.
11. Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, August 5, 1998.
12. Remedial Investigation Report Addendum Including AOC 3A, AOC 7A, SWMU 5/6 and Dredge Spoils Area, prepared by ENSR Corporation, October 2000.
13. Groundwater Remedial Investigation Report: VOC Area, prepared by ENSR Corporation, October 2000.
14. HydroPunch Groundwater and Soil Investigation Report for the VOC Area, prepared by ENSR Corporation, October 2001.
15. Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.
16. Air Sparging with Soil Vapor Extraction Pilot Study Work Plan, prepared by Environmental Resources Management, September 2002.
17. Letter from William Butler, Environmental Resources Management, to Mr. Clifford Ng, USEPA Region 2, and Mr. Bryan Moore, NJDEP, RE: Site-Specific Risk Evaluation of the Groundwater to Indoor Air Pathway, September 20, 2002.

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	Trespasser	Recreation	Food[3]
Groundwater	No	No	No	No	--	--	No
~~Air (indoor)~~							
Surface Soil (e.g. < 2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	--	No	No	No	No
Sediment	No	No	--	No	No	No	No
Subsurface Soil (e.g., > 2 ft)	--	--	--	No	--	--	No
~~Air (outdoors)~~							

Instruction 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. These spaces instead have dashes ("--"). 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:

Groundwater

Groundwater is not used at the site as potable water, and surrounding residents use municipally supplied drinking water from local surface water resources in which the water originates from deep regional aquifers. Thus, groundwater does not represent a complete exposure pathway since drinking water in this area is supplied by a local, municipal water supply system. The two areas at the site where groundwater contamination is known are the dredge spoils area and the VOC plume area.

Dredge Spoils Area

Groundwater in the dredge spoils area flows towards the Delaware River and away from residential areas. Groundwater is at a depth of 12 feet bgs, thus construction worker exposure to groundwater is not of concern. While exposure to contaminants in groundwater in this area is unlikely, Solvay Solexis proposes, in the October 2000 Addendum to the Remedial Investigation Report, to establish a groundwater CEA for the shallow aquifer in the immediate area of the dredge spoils pursuant to the requirements of the N.J.A.C. 7:9-6 (Ref. 2). The CEA would encompass the entire dredge spoils area, bounded to the northwest and northeast by the Delaware River, extending to the former shoreline to the southeast and the property boundary on the southwest. The CEA would apply to those metals in the shallow groundwater which currently exceed NJ GWQC, including aluminum, antimony, cadmium, iron, lead, and manganese. The longevity of the proposed CEA would be indeterminate based on the inability of metals to naturally attenuate. Furthermore, Solvay Solexis recommends that all groundwater monitoring wells in the dredge spoils area be abandoned upon development and approval of the proposed CEA, with no on-going monitoring program. The CEA proposal is under NJDEP review. The implementation of a CEA would further reduce the current and future potential exposures to contaminated groundwater in this area.

VOC Plume Area

Because groundwater is located at a depth greater than 15 feet bgs, construction worker exposure to groundwater is not of concern. In addition, groundwater is not used at the site as potable water, so there is no potential for human exposures to VOCs in groundwater through consumption of potable water. In addition, surrounding residents use municipally supplied drinking water. However, as part of the groundwater investigation for the VOC area, a municipal well search was conducted. Sampling and analysis was conducted at four residential wells which are located approximately one-half mile downgradient of the site and accessible. None of the four wells sampled exceeded applicable drinking water standards (Ref. 4 and Ref. 5). In a separate correspondence, NJDEP Bureau of Safe Drinking Water notified the local Health Officer that any water obtained from these four wells is acceptable for drinking and other domestic uses (Ref. 4). These findings are consistent with results of the groundwater flow and transport model (based on reasonably conservative parameters) presented in Report No. 2 for Groundwater and Soil Investigation (Ref. 2), which predicted that CVOCs in groundwater beneath the Solvay Solexis site is not expected to extend off-site as far as the residential wells. The model also found that CVOCs would naturally attenuate within 1,000 feet from the downgradient edge of the property (Ref. 2). The groundwater modeling results support the conclusion that any off-site migration is not expected to impact groundwater in downgradient residential wells (which are about one-half mile downgradient from the site).

Surface/Subsurface Soil

SWMU 7/8/9

Contaminants in soil at SWMU 7/8/9, including arsenic, beryllium and lead, exceed NJ NRDCSCC. A draft deed notice was submitted to NJDEP in May 2002 outlining all areas of residual arsenic and beryllium contamination above NJ RDCSCC (Ref. 1). A soil cap consisting of two feet of vegetated clean fill soil has also been installed to prevent direct exposure in the area and the draft Deed Notice outlines that the capping mechanism must remain intact. Access to this area is restricted by fencing and signage. Solvay Solexis will also perform semi-annual inspections to ensure that the use and conditions of this area remain the same. In addition, the entire site is located in an industrial area, is fenced, and maintains an on-site security system such that trespassing is highly unlikely. Thus, on-site worker, construction worker, and trespasser exposure to contaminants at SWMU 7/8/9 are not considered potentially complete exposure pathways.

Surface Water/Sediment

Groundwater samples located in the most downgradient portion of the property closest to the Delaware River were evaluated relative to ten times the NJ GWQC and/or the NJ SWQC. Only cadmium was shown to exceed ten times the NJ GWQC. However, given that only one constituent exceeded its criterion, it was detected infrequently, and the concentration only slightly exceeds its criterion, it is not considered a contaminant of concern relative to groundwater to surface water discharge into the Delaware River at this site. In addition, the Delaware River is a large navigable river in the vicinity of the site. Thus, a natural mixing of groundwater will occur once it reaches the Delaware River thereby reducing contaminant concentrations upon discharge. Thus, current human exposure to site-related contaminants in surface water within the Delaware River is not considered of concern and the pathway is not considered complete.

Reference(s):

1. Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atochem, Re: Pennwalt/Atochem, June 9, 1995.
2. Report No. 2 of Groundwater and Soil Investigations at the Elf Atochem Former Thorofare, New Jersey Facility, prepared by McLaren/Hart Environmental Engineering Corporation, March 29, 1996.
3. Letter from Gary Shelby and Virginia Hubert, Elf Atochem, to Ms. Rosemary Lafferty, NJDEP, March 4, 1997.
4. Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, August 1, 1997.
5. Work Plan No. 3 for Groundwater Investigations and Development of Alternate Soil Cleanup Criteria, prepared by McLaren/Hart, Inc., November 25, 1997.

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 cannot 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:

This question is not applicable. See response to Question No. 3.

[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.

This question is not applicable. See response to Question No. 3.

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 Solvay Solexis, Inc. Facility, EPA ID#NJD980753875, located at 10 Leonards Lane, Thorofare, New Jersey, 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: Date: 6/24/03

Kathy Rogovin
Risk Assessor
Booz Allen Hamilton

Reviewed by: Date: 6/24/03

Kristin McKenney
Risk Assessor
Booz Allen Hamilton

Also Reviewed by: Date: 6-25-03

Clifford Ng, RPM
RCRA Programs Branch
EPA Region 2

Date: 6/30/03

Barry Tornick, Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: Date: 6/30/03

Adolph Everett, Acting Chief
RCRA Programs Branch
EPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15th Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

Contact telephone and e-mail numbers:

Clifford Ng, EPA RPM
(212) 637-4113
ng.clifford@epamail.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.

Attachments

The following attachments has been provided to support this EI determination.

Attachment 1: Summary of Media Impacts Table

Attachment 2: Figures referenced in the CA725 EI Determination for Solvay Solexis Inc. site in Thorofare, NJ.

Attachment 1 - Summary of Media Impacts Table
Solvay Solexis Corporation

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Area 3A. Former Operations Area.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 7A. Monomer Furnace Area.	Yes*	No	Yes	No	No	Yes	No	Soil excavation Cement Slab	Metals
SWMU 1. RCRA Regulated Incinerator System.	No	No	No	No	No	No	No	NFA	NFA
SWMU 2. Container Storage Area.	No	No	No	No	No	No	No	NFA	NFA
SWMU 3/4. Inorganic and Organic Wastewater Treatment System.	No	No	No	No	No	No	No	NFA	NFA
SWMU 5/6. Former Neutralization Pits and Inlet Sump.	Yes*	No	No	No	No	No	No	NFA	NFA
SWMU 7/8/9. Dredge Spoils Area (Former Settling Lagoons, Retention Pond and Waste Pile).	Yes*	No	Yes	No	No	Yes	No	Classification Exemption Area (CEA) proposed for entire dredge spoils area with no on-going monitoring program Fencing/Security	Metals
SWMU 10/11. Kynar Polymer Release Area and Stormwater Drainage Ditch.	No	No	No	No	No	No	No	NFA	NFA

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
SWMU 12. Inactive Septic Tanks and Tile Field.	Yes*	No	No	No	No	No	No	NFA	NFA
SWMU 13. Vegetation Area.	No	No	No	No	No	No	No	NFA	NFA

[1] A "No" for soil exceedence does not necessarily indicate there is no contamination present, only that there are no exceedences of the NJ non-residential direct contact soil cleanup criteria.

* There is a chlorinated volatile organic compound (CVOC) plume located in the southern portion of the facility under the active manufacturing area. Contamination has not yet been correlated to a specific area of investigation or SWMU although several areas and SWMUs exist above the CVOC plume. While investigations are still in progress, Solvay Solexis proposes to implement a classification exemption area (CEA) for the CVOC impacted areas on site and immediately off site in downgradient direction. In addition, Solvay Solexis proposes active remediation of highly contaminated areas, combined with monitored natural attenuation and ongoing monitoring.

Attachment 2

Figures referenced in the CA725 EI Determination for Solvay Solexis Inc. site in Thorofare, NJ.

1. Plate 1. Site Plan
   Source: RCRA Facility Investigation Task 5, Draft RFI Phase I Report, prepared by McLaren/Hart Environmental, dated February 28, 1992.

2. Figure 5. 1,1-DCE, Shallow Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

3. Figure 6. 1,1-DCE, Deep Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

4. Figure 7. 1,1-TCA, Shallow Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

5. Figure 8. 1,1-TCA, Deep Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

6. Figure 9. Carbon Tetrachloride, Shallow Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

7. Figure 10. Carbon Tetrachloride, Deep Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

8. Figure 11. 1-Chloro-1,1-Difluoroethane, Shallow Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

9. Figure 12. 1-Chloro-1,1-Difluoroethane, Deep Wells
   Source: Remedial Investigation Report Addendum: November 2001 VOC Area Groundwater Sampling Event, prepared by ENSR Corporation, June 2002.

10. Figure 2. VOC Area Map - Monitoring Well Locations
    Source: Hydropunch Groundwater and Soil Investigation Report for the VOC Area, prepared by ENSR Corporation, October 2001.