Documentation of Environmental Indicator Determination
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: ATOFINA Chemicals (Formerly Pennwalt Corporation)
Facility Address: 100 South Street, Holmdel, NJ 07733
Facility EPA ID#: NJD052788528

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 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 objectives 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 is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does 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 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 ATOFINA Chemicals (ATOFINA) site, formerly known as the Pennwalt Corporation site, is located on approximately 117 acres in east central New Jersey. The site was used as a produce farm until 1950, when Bendix Corporation developed the land for manufacturing semiconductors. In 1971, the property was transferred to the S.S. White Division of the Pennwalt Corporation for use in manufacturing dental equipment, instruments, and supplies. Manufacturing operations ceased in 1983, and the facility was decommissioned in 1985. In 1990, Pennwalt Corporation became Elf Atochem North America. Elf Atochem North America subsequently became ATOFINA Chemicals in June 2000. The main plant and outbuildings, which occupy most of the central portion of the site, remain vacant to date. The northern and southern portions of the site are currently being used for agricultural purposes, and the western end of the property is used by the township for athletic events. Adjacent land use is primarily undeveloped or residential. The site is bordered to the south and southwest by Willow Brook; flow in the brook is to the southeast toward the Swimming River Reservoir. A natural freshwater pond, called East (Fire) Pond, is located on site along the property line east-northeast of the Main Building Area.

Resource Conservation and Recovery Act (RCRA) units at the site are limited to two underground waste solvent tanks and two hazardous waste container storage areas. Although not used for storage of petroleum products, and therefore not typically considered RCRA underground storage tanks (USTs), the two waste solvent tanks are designated as UST-1 and UST-2. The hazardous waste units were operated under interim status until they were taken out of service in 1987 and 1988. The New Jersey Department of Environmental Protection (NJDEP) approved formal RCRA closure for these units on December 19, 1989.

Environmental investigation of the ATOFINA site was initiated in 1986 under the NJDEP Environmental Cleanup and Responsibility Act (ECRA). Between 1986 and 1990, remedial activities were implemented at various areas of environmental concern (AECs). Approximately 2,000 cubic yards of soil were excavated and removed from the site due to contamination by chlorinated solvents, primarily trichloroethene (TCE). A number of subsequent investigation efforts have been implemented at the ATOFINA site to evaluate groundwater and soil beneath two specific AECs (UST-2 and Firing Range areas), which are the only two remaining concerns at this site. Because groundwater contamination remains above the New Jersey Ground Water Quality Criteria (NJ GWQC), groundwater Classification Exception Areas (CEAs) and Well Restriction Areas (WRAs) are currently being finalized for all appropriate portions of the site and downgradient areas. Aggressive remedial strategies to remediate groundwater at the site are planned for summer 2002.

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 Historical Operations and AECs: Twenty-seven AECs were identified at the site during various investigation activities. Nineteen of these AECs were subsequently closed due to completed remedial action and/or further investigation efforts indicating that no further actions were required. The available documentation indicates that NJDEP approved no further action determinations for these AECs (Refs. 3, 6, 7, 8, 9, and 10). A small amount of additional soil investigation and remediation were required by NJDEP at six AECs (Ref. 3), but the available documentation does not provide additional details regarding investigation, remedial action, and closure at these AECs. However, considering that these AECs have not been included in recent NJDEP correspondence or NJDEP-approved investigation and remedial activities, these six AECs are assumed to have been addressed and subsequently closed. Hence, there are only two remaining AECs at the site: the UST-2 Area and the Firing Range Area. Refer to Figure 1-2 of the April 2002 Groundwater Monitoring Report for a map showing the AEC locations at the ATOFINA site (Ref. 13).

UST-2 Area: This AEC addresses the former location of a 7,500-gallon concrete solvent waste tank in the west central portion of the site. While in use, the tank received chlorinated solvents and wastewater from sinks and floor drains in the southwestern portion of the Main Building. The tank was removed from the site in accordance with RCRA requirements in August 1987. NJDEP approved the closure in December 1989.

Groundwater monitoring in the UST-2 Area has been ongoing since 1987. Dissolved volatile organic compounds (VOCs) in groundwater have long been attributed to historic discharges from UST-2. However, while attempting to define the upgradient plume edge in 1999, ATOFINA discovered even greater VOC concentrations upgradient of the former tank excavation area and beneath the Main Building, indicating the presence of another previously unidentified contamination source area. Soil samples collected later in 1999 indicate very localized contaminated areas beneath the southwestern corner of the Main Building and at the base of the former tank excavation, where residual tetrachloroethene (PCE) concentrations exceed New Jersey Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC). VOCs were not reported in soil beneath other areas of the Main Building (e.g., the former plating area, laboratory area, or hallway sump area). Construction records from 1970 indicate that an area of contaminated soil may have been present near the rear wall of the

original building (approximately 30 feet north of the current front wall), and that the impacted soil may have been removed as part of the grading and building expansion effort (Ref. 11). Soil in the suspected former source area will be further evaluated when and if the Main Building is demolished for redevelopment of the property. Groundwater samples collected in 1999 show PCE present at the highest concentration in the well installed inside the southwestern corner of the building (MW-103), and trichloroethene (TCE) present at the highest concentration in the well installed near the center of the building at the former plating and laboratory area (MW-104).

Firing Range Area: This AEC, historically used by local police for target practice and currently used for farming, is located approximately 1,500 feet southeast of the Main Building. Based on an NJDEP-approved Cleanup Plan, approximately 1,500 cubic yards of impacted soil were removed from the Firing Range Area in 1989. The excavation extended to a depth of 15 to 20 feet below ground surface (bgs), where groundwater was first encountered. To stabilize the steep slope and control erosion, approximately 130 linear feet of steel shoring was installed along the southern edge of the AEC. The shoring was advanced to a depth of approximately 30 feet, and was keyed into the underlying clay unit at 25 feet bgs (Ref. 11). Two large-scale groundwater pumping and off-site disposal events were also conducted immediately following the excavation. NJDEP approved the completed soil and groundwater remedial actions in a compliance letter dated October 5, 1990. Although soil is no longer a concern at the Firing Range Area, dissolved VOCs in groundwater continue to be reported above the NJ GWQC. ATOFINA contends that the combination of steel and clay effectively eliminates horizontal or vertical groundwater flow away from the Firing Range Area (Ref. 7).

Groundwater: The groundwater of primary concern at the ATOFINA site is found in two water-bearing zones of the Navesink Formation. A shallow water table aquifer is encountered beneath the site in silty sand, sandy silt, and clay strata at approximately 15 feet bgs. A deeper aquifer is first encountered in similar strata at approximately 30 to 35 feet bgs. The two units are separated by an aquiclude of clay and silt. Groundwater flow direction in the shallow water table aquifer varies across the site. In the Firing Range Area, shallow groundwater flows southeast toward the steel shoring installed as part of a previous remedial action, Willow Brook, and wetlands areas. In the UST-2 Area, flow is southwestward toward Willow Brook. Beneath the Main Building, shallow groundwater flows south, southeast, and southwest. Horizontal flow velocity has been reported at approximately 20 to 40 feet per year in the shallow water table aquifer (Refs. 4, 5). Groundwater movement in the deeper Navesink aquifer is to the south beneath the entire site. VOCs have been detected above NJ GWQC at both AECs in both the shallow and deep Navesink aquifer. The Magothy Formation, at a depth of over 350 feet bgs, is also present beneath the site and serves as the principal aquifer for groundwater supply in this area. Considering that the estimated vertical extent of groundwater contamination is 65 feet bgs (Ref. 13), the Magothy Formation is not expected to be impacted by VOCs at this time.

A downward vertical gradient has been observed beneath most of the site, reported at 0.46 in the UST-2 Area and 1.40 in the Firing Range Area (Ref. 2). Nevertheless, sentinel wells closest to Willow Brook in the Firing Range Area, including deeper well FRSW-3, exhibit upward flow and artesian conditions (Ref. 4). ATOFINA contends that both shallow and deeper groundwater in the Navesink aquifer discharge completely into Willow Brook (Ref. 5), with the surface water body thereby acting as a barrier to lateral contaminant migration in groundwater.

References:

1. Letter from Kenneth Hart, NJDEP, to Sam Balamoun, Atochem North America. Re: Cleanup Plan (Full Compliance). Dated October 5, 1990.

2. Hydrogeologic Investigation and Public Health and Environmental Assessment. Prepared by Groundwater Technology and Environmental Liability Management. Dated January 1991.

3. Letter from Dawn Pompeo, NJDEP, to Peter Sacripanti, Sherman and Sterling. Re: Pennwalt Corporation (Negative Declaration and Additional Sampling Requirements). Dated March 5, 1991.

4. Revised Natural Remediation Compliance Work Plan for the Former S.S. White Facility, Holmdel, New Jersey. Prepared by Groundwater Technology. Dated April 23, 1993.

5. Progress Report of Remedial Investigation at the Elf Atochem North America Facility. Prepared by Groundwater Technology. Dated December 1994.

6. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Progress Report of Remedial Investigation and Site Investigation Report. Dated September 19, 1995.

7. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Underground Storage Tank (UGST) Closure Plan Approval Application for Closure. Dated Jan 16, 1996.

8. Remedial Investigation Report and Remedial Action Workplan for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by SECOR International. Dated December 13, 1996.

9. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Site Assessment Report and Results of Analysis of Soil Samples for Trivalent and Hexavalent Chromium. Dated August 8, 1996.

10. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Remedial Investigation Report/Remedial Action Workplan. Dated May 21, 1997.

11. Remedial Investigation Report for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by Sovereign Consulting. Dated February 17, 2000.

12. Remedial Action Workplan for the Firing Range Area. Prepared by Jacques Whitford Company, Inc. Dated March 2001.

13. Ground Water Monitoring Report for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by Jacques Whitford Company, Inc. Dated April 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			VOCs
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			VOCs
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

As stated previously, VOCs have been detected in groundwater above NJ GWQC beneath both of the remaining AECs. Maximum detected concentrations reported in the most recent sampling events for which data are available are summarized in Table 1 (Refs. 7, 9, 10, and 14). The locations of the monitoring wells are depicted in Figure 1-2 of the Ground Water Monitoring Report (Ref. 14). The nature of groundwater contamination in each area is described in the paragraphs below.

Table 1 - Monitoring Wells with Concentrations (µg/L) Exceeding the NJ GWQC

Constituent	Well Location with Concentrations Exceeding NJ GWQC	Maximum Detected Concentration	NJ GWQC
UST-2 Area[1]			
1,1-Dichloroethene	**MW-106**	9.2	2
Tetrachloroethene	MW-2, MW-8, MW-18, MW-101, **MW-103**, MW-107	840	1
Trichloroethene	MW-C, MW-8, MW-18, MW-103, **MW-104**, MW-106, MW-107, MW-201	398	1
Vinyl Chloride	**MW-103**	11	5
Firing Range Area[2]			
cis-1,2-Dichloroethene	FRMW-D, **FRMW-E**, FRMW-F, FRSW-2	122	70
Tetrachloroethene	FRP-3, FRP-7, FRMW-D, **FRMW-E**, FRMW-F, FRMW-G	389	1
Trichloroethene	FRP-3, FRP-4, FRP-7, FRMW-D, **FRMW-E**, FRMW-F, FRMW-G, FRSW-2	32.1	1
Vinyl Chloride	**FRSW-2**	5.1	5

The well locations of maximum detected concentration are **bold**.

[1] Constituent exceeding the NJ GWQC in samples collected during May 2000 sampling event (MW-C, MW-2, MW-8, MW-101, and MW-106), August 2001 sampling event (MW-201), or February 2002 sampling event (MW-103 and MW-107).

[2] Constituents exceeding the NJ GWQC in samples collected during August 1999 sampling event.

UST-2 Area Organic Groundwater Impacts

Groundwater monitoring in the UST-2 Area was initiated in 1987. The most recent area-wide sampling event occurred in May 2000, but a few additional samples were collected from the UST-2 Area in February 2002. PCE, TCE, and related organic contamination have been detected above NJ GWQC in groundwater beneath the UST-2 Area, and approximately 50 feet upgradient of the former tank area beneath the Main Building (Ref. 3). As stated previously, soil in the suspected former source area will be further evaluated when and if the Main Building is demolished for redevelopment of the property; at that time, it may be appropriate to conduct additional sampling to determine the upgradient extent of groundwater contamination.

While the highest levels of contamination have been observed in the shallow portion of the Navesink aquifer, a localized area within the deeper portion of the aquifer has also been impacted. In May 1999, deep well MW-14 contained PCE above NJ GWQC at a concentration of 2.5 µg/L (Ref. 5). In May 2000, newly installed deep well MW-107 (screened between 50 and 55 feet bgs) reported PCE and TCE concentrations of 1.5 and 4.6 µg/L, respectively (Ref. 8). Given the available information, other wells screened across the deeper Navesink aquifer do not appear to be impacted.

In order to gauge the vertical extent of groundwater contamination, samples were collected from the shallow/deep nested well pair at MW-103 and MW-107 in February 2002. The PCE concentrations in MW-103 and MW-107 were 840 and 15 µg/L, respectively (Ref. 14). The TCE concentrations in MW-103 and MW-107 were 190 and 3.3 µg/L, respectively (Ref. 14). Based in these results and the assumption that concentrations decrease linearly with depth, ATOFINA has estimated that COC concentrations drop below the applicable NJ GWQC within one foot of the bottom of well MW-107. However, to be conservative, the maximum depth of groundwater impacts above NJ GWQC is assumed to be 65 feet bgs (Ref. 14).

UST-2 Area Inorganic Groundwater Impacts

Lead, mercury, nickel, and selenium were detected in groundwater samples collected from temporary wells advanced within the main plant building at the UST-2 Area in October 1999. ATOFINA attributed the elevated metals concentrations to high turbidity in the samples. To confirm this assessment and verify that actual metals concentrations in the area were below applicable NJ GWQC, nearby monitoring well MW-104 was sampled for total and dissolved metals in February 2002. Low-flow sampling techniques were used to minimize sample turbidity. Results presented in the Groundwater Monitoring Report from April 2002 (Ref. 14) indicated no exceedances of the NJ GWQC for metals. During a meeting between NJDEP and facility representatives, it was agreed that if the results of this resampling effort were below NJ GWQC or naturally occurring background levels, metals in groundwater would no longer be considered an issue for the ATOFINA site (Ref. 13). Consequently, lead,

mercury, nickel, and selenium have been eliminated as constituents of concern for groundwater (Ref. 14).

Firing Range Area Organic Groundwater Impacts

Since source removal was completed in 1989, 21 groundwater monitoring events have been conducted in the Firing Range Area. PCE, TCE, and related VOCs have long been reported in shallow groundwater beneath this area. The most recent area-wide sampling event occurred in August 1999. Maximum contaminant concentrations observed in groundwater during this sampling event are shown in Table 1. As indicated by these results, the area of greatest impact in shallow groundwater is located at well FRMW-E in the center of the Firing Range Area, just north and upgradient of the steel shoring. Nearby well FRMW-D is also situated within the suspected contamination source area.

Well FRMW-H was installed in the Firing Range source area to assess the possibility of vertical contaminant migration. Three sampling rounds in 1996 showed VOC concentrations in deeper Navesink groundwater in this area to be below NJ GWQC. Current hydrogeological investigation results show that the clay layer underlying this location, with "negligible" permeability, significantly restricts vertical contaminant migration (Ref. 2). Monitoring of deep wells FRMW-1, FRSW-3, and FRSW-5 (located outside of the main source area at the Firing Range) further confirms that the deeper water-bearing unit has not been impacted. Although NJDEP previously requested advancement of at least one additional deep well upgradient of the steel shoring in this area (Ref. 6), NJDEP appears to have abandoned this requirement and now considers vertical contaminant delineation to be complete in the Firing Range area (Ref. 13).

Air (Indoor)

Recently detected VOC concentrations in groundwater in the shallow portion of the Navesink aquifer (approximately 15 feet bgs) were evaluated to determine whether migration of VOCs to indoor air may be of concern for the Main Building located in the UST-2 area. Maximum detected VOC concentrations detected beneath the building from groundwater sampling events conducted May 2000 and February 2002 were compared to State of Connecticut Industrial/Commercial Volatilization Criteria (CT I/C VC). Vinyl chloride (11µg/L, MW-103) is the only VOC that exceeds its respective CT I/C VC. The maximum detected concentration of vinyl chloride is located in shallow groundwater beneath the southwestern corner of the Main Building. The Main Building is vacant and not currently used for industrial purposes; thus, migration of contaminants into indoor air is not currently a concern. However, to be conservative, the risk associated with the recently detected concentration of vinyl chloride was evaluated using the Johnson-Ettinger (JE) Model to determine if indoor may be a concern if the building was used for industrial purposes.

The JE Model calculates incremental risk and hazard values associated with the potential migration of volatile contaminants into indoor air. The use of the maximum detected values provides a conservative calculated risk estimate. Site-specific input parameters used in the model include: the depth below grade to bottom of enclosed space floor, depth below grade to water table, soil type, and soil/groundwater temperature. Conservative default values were used for the remaining parameters for which site-specific values were not readily available. The calculated incremental risk value for vinyl chloride is 4.2E-06, which is within the USEPA acceptable risk range of 1.0E-04 to 1.0E-06. Given that the building is not currently used and considering the results of the JE Model, volatilization of groundwater contaminants into indoor air at the Main Building in the UST-2 area does not appear to pose unacceptable risk at this time. See Attachment 2 for JE Model results for vinyl chloride.

Surface/Subsurface Soil

PCE was detected above the New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC) (6.0 mg/kg) in one subsurface soil sample collected from the UST-2 area during the Remedial Investigation (RI) in 1999 (Ref. 4). The detection of PCE in subsurface soil (7.81 mg/kg) was located at SB-25B which is beneath the southwestern corner of the Main Building. The extent of PCE in soil beneath the building and has yet to be fully delineated. ATOFINA has requested NFA for soil until the building is demolished. NJDEP approved this request on August 28, 2000 (Ref. 6).

As discussed in Question #1, impacted soil in the Firing Range Area has been remediated and no further action is required for soil in this area. However, arsenic is present in the Firing Range Area at concentrations up to 34.7 mg/kg, which is above the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC) and NJ NRDCSCC (both 20 mg/kg). ATOFINA maintains that the arsenic concentrations detected in the Firing Range Area are due to naturally-occurring background levels present in soil in this area. NJDEP has approved a site-specific background level for arsenic at this site of 40 mg/kg; thus, arsenic concentrations in the Firing Range Area are below the site-specific background level and are not a concern (Ref. 1).

Surface Water/Sediment

Groundwater beneath the ATOFINA site flows southward and southwestward toward Willow Brook. Because Willow Brook is considered a "gaining" stream in the area of the ATOFINA site, the potential exists for impacted groundwater from the Firing Range and UST-2 Areas to discharge to surface water. This determination is supported by upward trending groundwater contour lines near the Brook and in surrounding wetlands areas, along with artesian flow conditions in wells closest to Willow Brook. According to the NJDEP-approved Baseline Ecological Evaluation (BEE) (Ref. 11), groundwater in the Navesink aquifer discharges to the surface water body rather than flowing beneath it.

Surface water samples were collected from Willow Brook in 1990 and indicated no evidence of contamination by organic compounds or petroleum hydrocarbons. No

additional surface water sampling events have occurred or been required. NJDEP has recently approved ATOFINA's delineation of the horizontal and vertical extent of the groundwater contamination in the UST-2 and Firing Range Area. Current data indicate that groundwater contamination is maintained within site boundaries at UST-2 and Firing Range Area and is not extending to Willow Brook (Ref. 14). Sentinel wells are located in both the UST-2 area (MW-9, MW-202, MW-S) and Firing Range Area (FRSW-1, FRSW-4) which monitor the furthest downgradient extent of the plumes in both of these areas. Based upon the most recent groundwater data, the plumes are currently stabilized within their existing area of contamination, as plume related contamination is not being detected in sentinel wells in either area. Results of a Baseline Ecological Evaluation (BEE) also documented that groundwater contamination has not extended to Willow (Ref. 11). NJDEP approved this BEE and concurred that contaminated groundwater has not impacted Willow Brook (Ref. 15). Thus, given that contaminated groundwater is maintained within site boundaries and monitored by on-site sentinel wells upgradient of Willow Brook, discharge of elevated concentrations of VOCs in groundwater in to groundwater is not currently a concern for this site.

One surface water sample and one sediment sample were collected from the East (Fire) Pond in October 1999. Arsenic was detected in surface water (6.3 µg/L) above the New Jersey Surface Water Quality Criteria (NJ SWQC), and in sediment (23 mg/kg) above the NJ NRDCSCC (Ref. 4). ATOFINA maintains that the elevated metals concentrations in surface water and sediment are due to naturally occurring background levels present in soil and sediment in the area of the site (Ref. 6). NJDEP has indicated that they also consider arsenic naturally-occurring at the site (Ref. 1).

Air (Outdoor)

No assessment of the impacts to outdoor air has been conducted at the site. However, migration of VOCs in soil (UST-2 Area) and groundwater into outdoor air in not expected to be of concern given the nature and extent of contamination at the site and due to the natural dispersion of contaminants once they reach the surface.

References:

1. Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Progress Report of Remedial Investigation and Site Investigation Report. Dated September 19, 1995.

2. Remedial Investigation Report and Remedial Action Workplan for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by SECOR International. Date December 13, 1996.

3. Letter from Gary Shelby, Elf Atochem North America, to Sharon Simmons Bruder, NJDEP. Re: Remedial Investigation Report and Response to NJDEP Correspondence. Dated August 9, 1999.

4. Remedial Investigation Report for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Sorvereign Consulting Inc. Dated February 17, 2000.

5. Letter from Gary Shelby, Elf Atochem North America, to Sharon Simmons Bruder, NJDEP. Re: Response to E-Mail from NJDEP Dated April 26, 2000. Dated May 8, 2000.

6. Letter from John Graham, NJDEP, to Gary Shelby, ATOFINA Chemicals, Inc. Re: Remedial Action Progress Report, UST 2 Area remedial Investigation Report, RA Progress Report, RIR, and Letter dated May 8, 2000. Dated August 28, 2000.

7. Remedial Action Workplan for Firing Range Area. Prepared by Jacques Whitford Company, Inc. Dated March 2001.

8. Letter from John Roberts, Jacques Whitford Company, Inc., to Gary Shelby, ATOFINA Chemicals. Re: Vertical Delineation Well MW-107. Dated May 31, 2001.

9. Letter from John Roberts, Jacques Whitford Company, Inc., to Sharon Simmons Bruder, NJDEP. Re: Response to NJDEP Comment Letter Dated August 28, 2000. Dated May 31, 2001.

10. Letter from John Roberts, Jacques Whitford Company, Inc., to Gary Shelby, ATOFINA Chemicals, Inc. Dated November 8, 2001.

11. Baseline Ecological Evaluation for the Former S.S. White Facility, Holmdel, New Jersey. Prepared by AMEC Earth & Environmental, Inc. Dated January 2002.

12. Letter from John Graham, NJDEP, to Gary Shelby, Elf-Atochem North America Inc. Re: Delineation Well Installation and Supplemental Sampling dated November 8, 2001. Dated January 31, 2002.

13. Letter from Gary Shelby, Elf-Atochem North America Inc, to Sharon Bruder, NJDEP. Re: Summary of February 6, 2002 Meeting and Proposed Schedule of Future Action. Dated February 21, 2002.

14. Ground Water Monitoring Report for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by Jacques Whitford Company, Inc. Dated April 2002.

15. Letter to Gary Shelby, ATOFINA, from John Gramham, NJDEP. Re: Baseline Ecological Evaluation. Dated April 11, 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)							
Surface Water				–			
Sediment							
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

Rationale:

Groundwater

The most recent available well survey (April 1990) indicated that 31 domestic wells are located within one-half mile of the site (Ref. 1). Some of the wells are located downgradient of known groundwater impacts, but all are situated beyond Willow Brook. Considering that NJDEP has approved the horizontal and vertical delineation of groundwater contamination, which indicates that contaminated groundwater does not extend off site, none of the domestic wells are expected to be impacted by contaminated groundwater at the site. It should also be noted that artesian conditions occur in both UST-2 and Firing Range Area such that groundwater from the Navesink aquifer discharges completely into Willow Brook, and thus acts as a migration barrier. Therefore, it is unlikely that contaminated groundwater from the site would impact the domestics wells beyond Willow Brook.

For the Firing Range Area, the most recent groundwater results from August 1999 indicates contamination in the shallow unit consists of cis-1,2-dichloroethene (DCE), TCE, PCE, and vinyl chloride at levels above NJ GWQC (Ref. 2). NJDEP has agreed that the vertical and horizontal extent of contamination has been defined and that contaminated groundwater does not extend to Willow Brook (Refs. 4, 5). According the available file materials, groundwater in the Firing Range area is not currently used for potable or industrial purposes (Ref. 2). Available file materials also indicate that contaminated groundwater at the Firing Range Area is located beneath a wooded area, not currently used for agriculture, approximately 300 feet north of Willow Brook (as shown in Figure 3-1 of the Ground Water Monitoring Report) (Ref. 8). The depth to shallow groundwater in this area ranges from 23 feet bgs at the edge of the wooded area (FRP-7) to two feet bgs at approximately 50 feet south of the edge of the wooded area (FRSW-2 and FRSW-6) (Ref. 8). Contaminants exceeding NJ GWQC have been detected in groundwater at a depth of two feet bgs. However, considering the average depth to groundwater and location of the impacted groundwater (in a highly wooded area) relative to the brook, it is unlikely intrusive activities will occur in the area and thus unlikely a construction worker would come into direct contact with contaminated groundwater. Thus, potential on-site receptors are not currently expected to come in direct contact with impacted groundwater at the Firing Range Area. If this site is redeveloped for industrial or residential use, direct contact with contaminated groundwater should be re-evaluated.

The UST-2 Area groundwater results from May 2000, August 2001, and February 2002 indicate that 1,1-DCE, cis-1,2-DCE, TCE, PCE, and vinyl chloride are present at levels above NJ GWQC. NJDEP has agreed that the vertical and horizontal extent of contamination has been defined and that contaminated groundwater does not extend to Willow Brook (Refs. 2, 4). The February 2002 groundwater monitoring results from

sentinel well MW-202 confirm that VOCs concentrations above NJ GWQC do not extend to Willow Brook (Ref. 8). Depth to contaminated shallow groundwater in the UST-2 Area is approximately 11 to 15 feet bgs (Ref. 8), making it unlikely that construction workers would come in direct contact with contaminated groundwater during intrusive activities. According the available file materials, groundwater in the UST-2 area is not currently used for potable or industrial purposes (Ref. 7). Thus, no potential on-site receptors are currently expected to come in direct contact with impacted groundwater at the UST-2 Area.

ATOFINA submitted CEA and WRA applications for the UST-2 and Firing Range Area in April 2002 (Refs. 6, 7). Once finalized, the CEA and WRA will become a public record and will allow NJDEP to monitor and prevent exposure to groundwater in the CEA and WRA area until the contaminant concentrations have been reduced to levels below the NJ GWQC. The CEA and WRA applications are currently under NJDEP review.

Subsurface Soil

PCE contamination detected in subsurface soil above NJ NRDCSCC is located beneath the southwestern corner of the Main Building. Although the extent of PCE in soil beneath the Main Building and has yet to be fully delineated, the building is still intact and thus no potential on-site receptors are currently expected to come in direct contact with contaminated subsurface soil. Available documentation does not currently identify any definite plans for redevelopment of this portion of the facility. However, if the Main Building is demolished and/or intrusive activities occur, precautions should be taken (e.g., personal protective equipment) to prevent exposure for on-site receptors to impacted soil. If the Main Building is demolished, the soil contamination under the building should also be delineated and potential exposure pathway(s) should be re-evaluated.

References:

1. Hydrogeologic Investigation and Public Health and Environment al Assessment. Prepared by Groundwater Technology and Environmental Assessment. Dated January 1991.

2. Remedial Action Workplan for Firing Range Area. Prepared by Jacques Whitford Company, Inc. Dated March 2001.

3. Letter from John Graham, NJDEP, to Gary Shelby, ATOFINA Chemicals, Inc. Re: Delineation Well Installation and Supplemental Sampling dated November 8, 2001. Dated January 31, 2002.

4. Letter from Gary Shelby, ATOFINA Chemicals, Inc., to Sharon Simmons Bruder, NJDEP. Re: Summary of 2/5/02 Meeting and Proposed Schedule of Future Action. Dated February 21, 2002.

5. Letter from Sharon Simmons Bruder, NJDEP, to Gary Shelby, ATOFINA Chemicals, Inc. Re: Baseline Ecological Evaluation. Dated April 11, 2002.

6. Classification Exception Area (CEA) Application for Firing Range Area. Prepared by Jacques Whitford Company, Inc. Dated April 2002.

7. Classification Exception Area (CEA) Application for UST- 2 Area. Prepared by Jacques Whitford Company, Inc. Dated April 2002.

8. Ground Water Monitoring Report for the Former S.S. White Facility, Holmdel, Monmouth County, New Jersey. Prepared by Jacques Whitford Company, Inc. Dated April 2002.

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:

This question is not applicable. See response to question #3.

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:

This question is not applicable. See response to question #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 ATOFINA Site, facility EPA ID# NJD052788528, located 100 South Street, Holmdel, 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: _____
Angela Sederquist
Risk Assessor
Booz Allen Hamilton

Reviewed by: _____ Date: _____
Kristin McKenney
Senior Risk Assessor
Booz Allen Hamilton

Also Reviewed by: _____ Date: _____
Clifford Ng,
Remedial Project Manager
RCRA Programs Branch
USEPA Region 2

_____ Date:_____
Barry Tornick, Section Chief
RCRA Programs Branch
USEPA Region 2

Approved by: Original signed by: Date: September 30, 2002
Raymond Basso, Chief
RCRA Programs Branch
USEPA 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:

USEPA Region 2
RCRA Records Center
290 Broadway, 15th Floor
New York, New York

and

NJDEP Office
Records Center, 6th Floor
401 East State Street
Trenton, New Jersey

Contact telephone and e-mail numbers: Clifford Ng, USEPA 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 have been provided to support this EI determination.
* Attachment 1 - Summary of Media Impacts Table
* Attachment 2 - JE Modeling Results

Attachment 1 - Summary of Media Impacts Table
ATOFINA Chemicals, 100 South Street, Holmdel, NJ 07733

AEC	GW	Air (Indoors)	Surface soil	Surface water	Sediment	Subsurface soil	Air (Outdoors)	Corrective Action Measure	Key contaminants
UST-2 Area	Yes	No	No	No	No	Yes	No	* NFA for soil until building is demolished * CEA/WRA * In-situ groundwater remediation using potassium permanganate is planned for Summer 2002.	PCE (Soil and GW), 1, 1-DCE, cis-1, 2-DCE, TCE, vinyl chloride
Firing Range Area	Yes	No	No	No	No	No	No	* Sheet piling installed * CEA/WRA * In-situ groundwater remediation using potassium permanganate is planned for Summer 2002.	cis-1,2-DCE, PCE, TCE, vinyl chloride

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile

contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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

[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.