



UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
STATEMENT OF BASIS  
SARTOMER COMPANY, INCORPORATED  
WEST CHESTER, PENNSYLVANIA  
EPA ID NO. PAD 042 259 374

## TABLE OF CONTENTS

SECTION	PAGE
I. Introduction.....	1
A. Facility Name and Location.....	1
B. Purpose of Document/Proposed Remedy.....	1
C. Importance of Public Input.....	2
II. Facility Background.....	3
A. Site History.....	3
B. Summary of Investigations.....	3
C. Summary of Interim Measures.....	6
III. Summary of the Environmental Issues .....	10
A. Contaminated Media.....	10
B. Summary of Facility Risks .....	10
1. Potential Receptors in Contact with Groundwater.....	10
2. Potential Receptors in Contact with Soil.....	11
IV. Proposed Remedy Performance Standards.....	11
V. Evaluation of EPA's Proposed Remedy Selection.....	11
<i>Performance Standards</i>	
1. Protect Human Health and the Environment.....	12
2. Attainment of Media Cleanup Standards.....	12
3. Controlling Source of Releases.....	12
<i>Balancing/Evaluation Criteria</i>	
1. Long-Term Reliability and Effectiveness .....	12
2. Reduction of Toxicity, Mobility or Volume of Waste.....	13
3. Short-Term Effectiveness .....	13
4. Implementability .....	13
5. Cost.....	13
6. Community Acceptance.....	13
7. State Acceptance.....	14
VI. Public Participation .....	14

Figure 1 - Map of the Plant Layout

Figure 2 - Map of areas of impact



## ACRONYMS

AHA	Applied Hydrology Associates
AR	Administrative Record
ARCO	Atlantic Richfield Company
BEA	baseline environmental assessment
BTH	Benzene, Toluene, and Heptane
DPE	dual-phase extraction
DSA	David S. Smallwood & Associates, Inc.
EPA	Environmental Protection Agency
ERM	Environmental Resources Management, Inc.
FDRTC	Final Decision and Response to Comments
FLP	Facility Lead Program
GAC	granular activated carbon
HSL	Hazardous Substance List
HSWA	Hazardous and Solid Waste Amendments
IC	Institutional Control
LNAPL	Light Non-Aqueous Phase Liquids
MCL	Maximum Contaminant Level
ORC <sup>®</sup>	Oxygen Release Compound
PADEP	Pennsylvania Department of Environmental Protection
POTW	publicly owned treatment works
QAPP	Quality Assurance Project Plan
RBC	Risk Based Concentration

RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
SB	Statement of Basis
SSL	Soil Screening Level
SVGES	soil vapor and ground water extraction system
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
U.S.C.	United States Code
VOC	Volatile Organic Compound

## **I. Introduction**

### **A. Facility Name and Location**

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) for the Sartomer Company, Incorporated facility (hereinafter referred to as the Facility or Sartomer). The Facility is located at 610 South Bolmar Street in West Chester, Chester County, Pennsylvania. The Facility consists of 12 contiguous acres of which 8 are the industrial portion. See Figure 1 for a map of the plant layout.

The Facility was once subject to the Corrective Action program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901 to 6992k. The Corrective Action program is designed to ensure that facilities have investigated and cleaned up, if necessary, any releases of hazardous waste and constituents from any solid waste management unit (SWMU). The Director of the Land and Chemicals Division of EPA Region 3 has determined that this property has had a release of hazardous waste and that the corrective action provisions of RCRA apply.

### **B. Purpose of Document/Proposed Remedy**

The purpose of this SB is to summarize investigation results and interim remedial actions performed at the Facility and to describe and solicit comments on EPA's proposed final remedy. Based on a review of past and present environmental practices, soil and groundwater sampling activities, historical investigations and remedial activities performed at the Facility, EPA is proposing Monitored Natural Attenuation with Institutional Controls as the final remedy. Natural attenuation refers to a system where a variety of physical, chemical, or biological processes act without human intervention to reduce the mass, toxicity, mobility, volume, and/or concentration of contaminants in soil or groundwater. Monitored Natural Attenuation simply refers to the act of collecting samples to monitor the natural attenuation process.

Because contamination will remain in the groundwater and soil at the Facility above unrestricted use concentrations, EPA's proposed final remedy includes Institutional Controls (ICs). ICs are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination and/or protect the integrity of a remedy. The ICs will be implemented in an Environmental Covenant which shall be drafted and recorded in a manner consistent with environmental covenants under the Pennsylvania Uniform Environmental Covenants Act (UECA), 27 Pa.C.S. §§6501-6517 (February, 2008). The proposed ICs are:

- groundwater under the property shall not be used for drinking water; other domestic uses; agricultural purposes; or in any other manner that could result in human exposure or otherwise adversely affect the natural attenuation processes;
- the Property shall not be used for agricultural, educational, health care, day care, recreational or residential uses unless approved in advance and in writing by the EPA. Ancillary activities (such as employment, customer or community open houses, student career days and

shadowing, etc.) that are in support of the main commercial and/or industrial use of the Property are permitted;

- soils from the property shall not be moved unless treated as hazardous waste or handled according to the Pennsylvania Management of Fill Policy (25 PA. Code Chs. 271 and 287) with a Health and Safety Plan specific to the site contaminants; and
- monitoring wells as defined in section 4 of the Environmental Covenant are to remain in place and be protected against damage unless otherwise authorized in advance and in writing by the EPA.

In the Commonwealth of Pennsylvania, EPA has delegated most of the RCRA permitting program to the Pennsylvania Department of Environmental Protection (PADEP) based upon promulgated State regulations which are equivalent to, or more stringent than, the federal requirements. EPA has not yet delegated the RCRA Corrective Action requirements, under which this SB has been prepared, to PADEP. In Pennsylvania, EPA administers the RCRA Corrective Action program with authority to require environmental investigations and remedial actions at any facility that applies for a hazardous waste operating permit or otherwise operated under RCRA interim status.

PADEP issued the Facility a RCRA hazardous waste operating permit on December 17, 1992. Included was an EPA issued HSWA Corrective Action Permit (I.D. #PAD 042259374) (HSWA Permit) to the Facility which required the Permittee to investigate the extent of environmental contamination at the Facility and evaluate remedy options. The HSWA Permit expired on December 17, 2002. Prior to that, Sartomer signed a Facility Lead Agreement effective April 9, 2001 to voluntarily perform RCRA Corrective Action remediation efforts at the Facility.

### **C. Importance of Public Input**

The public may participate in the remedy selection process by reviewing this SB and documents contained in the Administrative Record (AR) for the Facility and/or submitting written comments to EPA during the public comment period. The information presented in this SB can be found in greater detail in EPA policies and EPA guidelines, or for specific facility information in site inspections, work plans, and reports which can be found in the AR. To gain a more comprehensive understanding of the RCRA activities that have been conducted at the Facility, EPA encourages anyone interested to review the AR. The AR and index are available for public review at the EPA Region III Office in Philadelphia as described in Section VI of this document.

As discussed in further detail in Section VI, below, EPA will address all significant comments submitted in response to the proposed remedy described in this SB. EPA will make a Final Remedy Decision and issue a Final Decision and Response to Comments (FDRTC) after it considers information submitted during the public comment period. If EPA determines that new information or public comments warrant a modification to the proposed remedy, EPA may modify the proposed remedy or select other alternatives based on such new information and/or public comments.

## **II. Facility Background**

### **A. Site History**

The Facility began chemical manufacturing operations in 1967 under Sartomer Company, a division of SARTOMER INDUSTRIES, INC. Prior to 1967, the Facility was used for agricultural purposes (reportedly as a horse farm and pasture). Please refer to the August 2001 FLP Work Plan for a detailed history of ownership transfer. It is primarily a manufacturer of multi-functional acrylate and methacrylate monomers that are used in the surface coating industry. Wastes generated by the site include various forms of wastewater or sludge containing acrylic or methacrylic acid, sodium hydroxide, and sodium salts. A hydrocarbon waste stream includes Benzene (until 1989), Toluene, and Heptane (BTH).

The Facility is located in an industrial area of West Chester and is bordered by a Southeastern Pennsylvania Transportation Authority (SEPTA) railroad track to the southwest, Bolmar Street to the east, and Niels Street to the northwest. A vacant property owned by Wyeth-Ayerst Laboratories, Inc. (Wyeth) is located on the north side of Niels Street. A parking lot for the Wyeth facility is located on the south side of Niels Street and adjacent to the Sartomer property. The closest residential area consists of two residences located across Bolmar Street on the northeast side of the plant. The closest surface water bodies include Goose Creek, a tributary to Chester Creek located along the southwest side of the Facility; an unnamed tributary to Goose Creek, located along the southwest side of the Facility; and a second unnamed tributary to Goose Creek, located along the southeast side of the Facility.

### **B. Summary of Environmental Investigations**

A property transfer site baseline environmental assessment (BEA) was complete by IT Corporation between October and December 1986. Results of eight soil borings indicated only trace quantities of volatile organic compounds (VOCs) in the surface and sub-surface soils. Ground water samples from four shallow wells were collected and analyzed for Hazardous Substance List (HSL) VOCs, semi-volatile organic compounds (SVOCs) and total zinc. Initial results indicated that Benzene was detected in ground water samples collected from select monitoring wells.

Also in October 1986, A.T. Kearney (Kearney) prepared a Preliminary Review of SWMUs at Sartomer. This review briefly summarized each SWMU and identified information needs to be identified in a visual inspection scheduled for October 15, 1986.

In November 1986, Kearney submitted a RCRA Facility Assessment (RFA) for Sartomer. This report did not identify any significant areas of concern nor give any significant conclusions or recommendations regarding releases subject to Corrective Action at the Facility.

Several voluntary site investigative activities occurred during 1987 driven by the findings of the BEA results. The analytical results of an additional round of ground water samples collected from the existing four shallow wells during April 1987 confirmed the initial Benzene detections. Seven new monitoring wells were installed in June 1987. Ground water samples



were collected and Benzene was detected in 9 of the 11 monitoring wells. During September 1987, additional ground water samples from the 11 monitoring wells, 11 shallow ground water samples from the wetland/wooded area adjacent to the southern site boundary, surface water samples, and soil gas sampling at over 100 nodes were collected to further delineate the extent of the contamination. Based on the results of the water samples and soil gas study, soil borings were advanced and soil samples were collected and sampled for VOCs. The purpose of this task was to identify and delineate potential subsurface source areas of site-related constituents. The areas of impact identified from these investigations include the following:

- **Area I:** This area extends southwest from Pad A to the remediation office trailer. A portion (1/2) of the Pad A Process Area, Pilot Plant Building, Maintenance Shop, and Boiler Room are located in this area. The area adjacent to the remediation office trailer is referred to as Area IA.
- **Area II:** This area extends southwest from just south of Pad C to tank T-195. The Hazardous Waste Storage Tank Farm and former process water sewers are located within Area II.
- **Area III:** This area extends between Areas I and II along the main plant roadway in the vicinity of process water sewer lines.

See Figure 2 for a map showing these areas.

Light Non-Aqueous Phase Liquid (LNAPL) was first discovered in a recovery well soon after the start-up of a ground water pump and treat system in March 1988 (discussed further below). Additional monitoring wells were installed during May and June 1988 to delineate the extent of LNAPL. A total of 15 wells have historically had measurable amounts of LNAPL. The average thickness of the LNAPL ranged from 0.2 to 2 feet.

Video inspections of the underground process sewer lines were conducted in October 1984, November 1988, and October 1989. Due to the condition of some of the lines, many were removed and replaced in 1984 and 1985. A leaking underground process transfer line, running under the floor of the Pilot Plant and connecting with Tank-184, was taken out of service and replaced with overhead piping during April 1987. The floor drain and sewer line located under Pad A were replaced in July 1987. An additional inspection of process sewer lines was completed during January 1999. Due to the condition of some of the lines, overhead lines were installed.

In January 1990 and September 1990, David S. Smallwood & Associates, Inc. (DSA) submitted a Sartomer Site Remediation Project Task 1 Final Report and Sartomer Site Remediation Project Task 2 Final Report, respectively. These reports described additional site investigation activities completed by DSA with assistance from Applied Hydrology Associates (AHA). A soil gas survey was completed during March 1990 in Areas 2 and 3, and Area I in the vicinity of Pad A. The goal of this survey was to identify potential sources of Benzene to ground water. The results were inconclusive with regards to identifying a source of Benzene to ground water. DSA attempted to identify unknown constituents suspected to be present in site ground water based on discrepancies between BTH concentrations and other gross measures of organic

compounds (i.e., total organic carbon, chemical oxygen demand, and volatile residue analyses). However, these attempts were unsuccessful at identifying the unknown constituents, and only determined that the unknown compounds likely have low volatility and a high molecular weight and create an organic residue when ground water samples are evaporated. DSA also collected samples of LNAPL for analysis to assess its composition. These results indicated that the LNAPL consists of the following constituents and corresponding percentages:

- Benzene (2 to 24 percent by weight);
- Toluene (0.3 to 2 percent by weight);
- Heptane (65 to 88 percent by weight); and
- Lights and other unknowns (7 to 11 percent by weight).

The lights and other unknowns could not be identified. It was determined that these unknown compounds eluted from the Gas Chromatograph between Heptane and Toluene and possess some volatility. Three test pits were excavated during May 1990 in Area II in the vicinity of monitoring wells MS-10 and MS-11 to locate potential sources of Benzene to ground water. Three soil samples and water samples were collected from each test pit and analyzed for Benzene and Toluene. Benzene and Toluene were present in each of the test pit soil samples and water samples. These results indicated a substantially higher Benzene concentration in the test pit water compared to soil, but the test pit investigation was inconclusive with regard to identifying a source of Benzene to ground water in these areas.

In 1996, Sartomer became responsible for directing remedial activities at the site through a contractual agreement with the Atlantic Richfield Company (ARCO), the previous site owner. Sartomer retained Environmental Resources Management, Inc. (ERM) to assist it with continuing the voluntary remediation program at the site. In 1996, ERM completed a soil and ground water sampling program to evaluate current site conditions, further delineate the extent of BTH in soil, and assess natural attenuation processes. Specific media of investigation included surface soils, subsurface soils and ground water. The results were used to determine the degree of cleanup achieved by a pilot dual-phase extraction (DPE) system; provide baseline data for assessment of further operation and fine-tuning for optimum performance of the pilot DPE system; provide additional data necessary for assessment of enhanced bioremediation as a remedial alternative; and provide comprehensive site-wide data to support the expansion of remedial actions to each area of concern, including some focused efforts around Pad A and the associated pit.

Ground water samples were completed from the majority of the accessible monitoring wells at the site during August 1996. Soil borings were advanced during September 1996. The soil boring locations were based on prior knowledge of the BTH distribution in ground water and soil obtained from past investigations and areas identified by Sartomer that had potentially been impacted by site operations. At the request of the PADEP at a meeting discussing the baseline investigation scope, additional soil borings with attendant soil sampling were advanced adjacent to the Pad A Pit area. The objective of this investigation was to delineate the horizontal and vertical extent of affected soil and ground water surrounding the Pad A pit. Specific information

regarding this investigation can be found in the May 22, 1997 Conditions Associated with the Pad A Pit Area Report submitted by ERM which can be found in the AR.

The conclusions drawn from the baseline soil and ground water investigation were historical data indicates a south-southwesterly ground water flow direction with the ground water pump and treat system containing affected ground water on site by creating an inward gradient toward the wells in the center of the site; historical LNAPL remedial efforts have substantially reduced the thickness and extent but some remains within Area IA; analytical results and subsequent analysis of biodegradation parameters demonstrate that BTH compounds are being biodegraded; soil is primarily affected by Benzene; and Toluene is limited to an area beneath the main road in Area III.

Seven depth interval soil samples were collected from a single soil boring advanced at Pad C on 15 February 2001 by ERM. These soil samples were collected and analyzed to evaluate whether soil underlying Pad C was impacted by Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and/or n-Heptane, and whether the soil was a potential source of these constituents to ground water. The measured concentrations of Benzene and Toluene were compared against USEPA and PADEP screening criteria. The results of this comparison suggested that further assessment may be warranted to address Benzene in soil underlying Pad C, since it was present at a concentration exceeding its EPA Region III Soil Screening Level (SSL) for groundwater migration of 1.8 µg/Kg.

### **C. Summary of Interim Measures**

During 1987 and 1988, IT Corporation designed and constructed a groundwater pump and treat system to contain affected ground water on plant property. This system commenced operation in March 1988, and consisted of 22 ground water recovery wells; dual equalization tanks; a set of cartridge filters; a dual-bed granular activated carbon (GAC) adsorption system; a carbon change-out system; and discharge to the Borough of West Chester publicly owned treatment works (POTW). At the time the system began, the VOC concentration at the facility boundary was more than 10,000 parts per billion (ppb).

In response to finding LNAPL in a recovery well in March 1988, active recovery began immediately. LNAPL recovery efforts included hand bailing, operation of automated skimmers, and construction of interceptor trenches. Hand bailing was performed periodically to remove LNAPL from monitoring wells where it was observed. An automated Wright skimmer was used to recover LNAPL between June 1988 and January 1989. These techniques resulted in a reduced volume of LNAPL based on decreased thickness measurements and areal extent of LNAPL. While hand bailing and automated skimming reduced the volume of LNAPL, these activities were stopped due to lack of effectiveness following removal of the initial quantities of LNAPL. However, it was IT Corporation's opinion that a significant volume of LNAPL remained in the soil pore space above the water table (i.e., smear zone). LNAPL trapped in the soil pore space is not readily recoverable by hand bailing and automated skimming techniques.

Two interceptor trenches were installed by IT Corporation during August 1988 to contain the LNAPL on site and to provide a means of recovering LNAPL. The interceptor trenches

would only recover LNAPL that was mobile and could flow into the trench by gravity, and would not be effective at recovering LNAPL trapped in the soil pore space above the water table.

Trench No. 1 was located adjacent to the Maintenance Shop area to capture potential LNAPL from the Pilot Plant/Boiler Room source area (Area I). Trench No. 2 was located hydraulically downgradient of and along the leading edge of the LNAPL extent with the primary purpose of preventing further LNAPL migration. Each trench was approximately 13-feet deep by 3-feet wide. A low-permeability liner was placed along the hydraulically downgradient sidewall of each trench to prevent further LNAPL migration. Filter fabric was installed along the upgradient sidewall to reduce the amount of soil that could wash into a clog the interceptor trench. The trenches were then filled with gravel from the bottom to a depth corresponding to a few feet above the water table. Filter fabric was laid over top of the gravel, and the trenches were backfilled to grade with sand. One collection sump was installed in Trench No. 1 and three collection sumps were installed in Trench No. 2. Automated skimmers were planned to be installed at each collection sump, but this was never accomplished since no LNAPL was ever observed in the collection sumps. The collection sumps were designed so that ground water could be pumped from them to induce LNAPL migration to and pooling at each collection sump.

In July 1990, DSA performed a field test to evaluate whether pumping ground water alone and in combination with an applied vacuum would induce LNAPL flow into a collection sump for recovery. The results indicated that pumping ground water alone or in combination with a vacuum were not sufficient to induce LNAPL migration to a well for subsequent recovery. No LNAPL has ever been observed or recovered from the interceptor trenches, but the trenches still provide a barrier to further LNAPL migration.

In June and July 1990, DSA completed vacuum-enhanced pumping testing to evaluate this technology as a remedial alternative for addressing affected soil and ground water, including smear zone impacts. Seven vacuum-enhanced pumping wells were installed. Testing was completed at each well with and without an applied vacuum, and the results suggested that vacuum-enhanced pumping was a potentially applicable remedial technology for remediating affected soil and ground water, including smear zone soils.

Between 1993 and 1995, Envirogen and GeoSyntec Consultants designed and pilot tested a soil vapor and ground water extraction system (SVGES), which is also referred to as DPE, based on and as a follow up to the results of DSA's vacuum-enhanced pumping pilot testing. This system was operated between August 1994 and July 1995. Based on the results, DPE was considered to be a viable technology for remediating affected soil and ground water, including smear zone impacts.

Between 1993 and 1995, Envirogen and GeoSyntec Consultants also designed and pilot tested an air sparging system in Area I. Air sparging was evaluated for its potential ability to enhance DPE, and was not considered as a stand alone technology. Air sparging tests were conducted during December 1994, January 1995, and April through June 1995. Based on the results, air sparging in combination with soil vapor extraction was considered to be a viable technology for remediating affected ground water, including smear zone impacts.

During 1995, ARCO Environmental Technology conducted an evaluation of the potential effectiveness of Oxygen Release Compound (ORC<sup>®</sup>) at increasing dissolved oxygen concentrations in ground water, which could potentially stimulate aerobic biodegradation of hydrocarbons in ground water. ORC<sup>®</sup> socks were placed in monitoring wells representing low hydraulic conductivity areas and other monitoring wells representing relatively higher hydraulic conductivity areas. Dissolved oxygen, iron, and dissolved hydrocarbons were reportedly monitored throughout the testing period. However, no conclusions were drawn regarding the ORC<sup>®</sup> performance because the monitoring and evaluation were limited.

Between May and September 1995, ARCO Exploration and Production Technology completed a microbial ecology study to assess the potential for naturally occurring biodegradation of hydrocarbons at the Sartomer site. This consisted of collecting ground water samples from various monitoring wells and analyzing the samples for BTEX, dissolved oxygen, temperature, pH, dissolved iron, manganese, nitrate, phosphate, and sulfate. The results of this evaluation demonstrated that intrinsic bioremediation was occurring and that there is a potential to stimulate naturally occurring biodegradation through the addition of oxygen.

A second intrinsic bioremediation evaluation was completed by ERM between August 1996 and April 1997 to evaluate naturally occurring biodegradation of hydrocarbons at the site. This consisted of collecting ground water samples from various monitoring wells and analyzing the samples for BTH, dissolved oxygen, oxidation-reduction potential, temperature, pH, ammonia as nitrogen, phosphorus, iron, manganese, nitrate, nitrite, sulfate, and hydrocarbon degrading bacteria. The results suggest that natural attenuation/intrinsic bioremediation is occurring at the site. These also suggest that natural attenuation could be an integral part of the overall remedial approach for the site once the total Benzene and Toluene concentration has been dropped to less than 10 mg/L across the site.

Additional DPE wells were installed within Area IA by ERM during August 1997 in response to discovering LNAPL in monitoring wells MS-04, MS-08, and MS-09 during August 1996. The DPE system in this area was operated between September and December 1997. LNAPL has not been observed in monitoring wells since operating this system.

During BEA activities completed by ERM in 1996, monomer product (appeared to be materials produced at the plant) was observed in a soil boring advanced adjacent to Tank T-195. On behalf of Sartomer, ERM completed soil excavation activities on the east side of Tank T-195 during October 1997 in response to discovering the monomer product. It was suspected that drums containing product may have been present in this area that could be acting as a source of BTH to ground water. Soil was excavated to a depth of 12 ft bgs. No drums were encountered in the excavation. Between 225 and 550 cubic yards of soil and approximately 120 cubic yards of waste materials (based on appearance) were excavated. Impacted soil and monomer product appeared to have been fully excavated based on field observations. Post-excavation soil samples were collected from the excavation and analyzed for VOCs. The analytical results indicated that BTH were the primary constituents of concern remaining in soil.

During 1998, additional DPE wells were installed in the vicinity of Pad A to remediate affected soil and ground water in these areas. The Pad A DPE system was tested during November and December 1998. Groundwater was extracted from these wells between April 1999 through May 2001. Ground water pumping was stopped in May 2001 so that the biosparging pilot test (described below) results would not be affected by pumping ground water.

Sartomer took the thermal oxidizer and soil vapor extraction system off line during December 1998 due to equipment problems. The former equipment was replaced with new equipment. This equipment was started during May 2001 as part of the Biosparging Pilot Test as a safety precaution to reduce potential BTH vapors that may migrate into buildings as a result of biosparging. This system operated in Area IA at a reduced vacuum to minimize the volume of ground water extracted from the wells during the biosparging pilot test.

Biosparging was identified by ERM, Sartomer, and IT as a potentially cost-effective approach for remediating ground water and smear zone impacts. A biosparging pilot test was conducted by ERM to evaluate the potential effectiveness of this technology. Existing air sparging wells and the associated equipment were used for this test. Testing was conducted in Area I between May and September 2001. Sartomer personnel performed indoor air monitoring throughout the pilot test to evaluate whether biosparging causes organic vapors to migrate inside the three buildings (i.e., Maintenance Shop, Pilot Plant Control Room, and Boiler Room) within the biosparging area. Baseline composite sample analytical results collected prior to pilot testing indicated that no organic vapors were present within the buildings. At an air injection rate of 3.0 cfm/air sparging well, real-time monitoring indicated that benzene was present in indoor air within the Maintenance Shop at concentrations just below and above 1.0 ppmv, the Occupational Safety and Health Association (OSHA) Permissible Exposure Limit. SVE was started, but was unsuccessful at reducing the benzene indoor air concentrations to a satisfactory level. Biosparging was halted based on these results since SVE was insufficient to prevent elevated levels of benzene in indoor air. The 2003 Annual Progress Report summarizes a September 25, 2002 meeting in which EPA eliminated the need for a Corrective Measures Study as the remedial technologies implemented have been effective and there was no need for further technology evaluation.

EPA evaluated the results of the Indoor Air Sampling received on October 8, 2003. Prior to sampling, the groundwater extraction and DPE systems were shut down. Based on the concentration results of Benzene, Toluene, and n-Heptane, on November 20, 2003, EPA agreed with and approved Sartomer's conclusions that these constituents were below workplace exposure limits and do not present an unacceptable health risk to site workers. Although the results did not determine whether or not the indoor air sampling detections were migrating from the underlying soil and/or groundwater, EPA determined that Sartomer demonstrated appropriate management of the risks and exposures under the existing OSHA Program.

Due to the effectiveness of the remedial measures implemented and in response to monitoring data showing low mass removal rates and with EPA approval, Sartomer shut down the groundwater pump and treat system and their DPE system on November 4, 2004 to evaluate the effectiveness of natural attenuation processes. The final Natural Attenuation Evaluation Results Report was received by EPA electronically on August 28, 2007. The conclusions were

that natural attenuation is occurring on the site based on the physical, chemical, and biological parameters measured and containing the plume on-site. EPA approved the report on November 21, 2007 agreeing with the conclusions that natural attenuation processes are occurring and allowing Sartomer to continue with this as a remedial measure with the following requirements:

- Monitoring of the source area, transition area, and downgradient/fenceline wells (MS-08, MS-11, MS-21, MS-27, RW-16, OW-04, RW-11, AND OW-02) every fifth quarter after December 2007.
- Analyzing for Benzene and Toluene only, and
- Future reports to be submitted as a results summary report via electronic mail following each groundwater sampling event.

All components of the groundwater pump and treat system will be kept available at the Facility in the event that sampling reveals Natural Attenuation is no longer precluding contamination from migrating beyond the property boundary and containing the plume on-site. In the event that this occurs, Sartomer will resume active remediation using the groundwater pump and treat system or another comparable technology submitted to, and approved by, the EPA under the Facility Lead Agreement.

### **III. Summary of Environmental Issues**

#### **A. Contaminated Media**

The media contaminated at the Facility consists of soil and groundwater. The principal contaminants identified in the soil and groundwater are Benzene and Toluene. The areas of groundwater contamination at the Facility are small, localized, and not migrating off-Site from the Facility.

#### **B. Summary of Facility Risks**

**1. Potential Receptors in Contact with Groundwater** – Environmental investigations performed by Sartomer at the Facility show that groundwater contamination is not migrating off-site. Therefore, since there are no drinking water wells at the Facility, the only possible groundwater receptors would be workers who would be exposed to groundwater during sampling of wells or other intrusive activities within the defined areas of on-site contamination. The ICs proposed will eliminate exposure within the defined areas and, thus, eliminate this pathway. In addition, a Health and Safety Plan will be required which will alert any worker to the contamination and ensure appropriate Personal Protective Equipment will be worn and preventive exposure measures will be taken. Furthermore, EPA proposes to require Sartomer to file an environmental covenant to notify prospective purchasers that the groundwater underlying the Facility is contaminated, and its use is restricted.

If Sartomer determines, on the basis of analytical results, that the concentration of each constituent has not exceeded its respective cleanup level for three consecutive years, Sartomer

may request in writing, for EPA approval, that corrective action for groundwater contamination at the Facility be terminated.

**2. Potential Receptors in Contact with Soil** – Environmental investigations performed by Sartomer at the Facility show that soil contamination exists at the Facility. Similar to groundwater, the ICs proposed will eliminate exposure within the defined areas eliminating this pathway. Also, a Health and Safety Plan will be required which will alert any worker to the contamination and ensure appropriate Personal Protective Equipment will be worn and preventive exposure measures will be taken. Lastly, EPA proposes to require Sartomer to file an environmental covenant to notify prospective purchasers that soils at the Facility are contaminated.

#### **IV. Proposed Remedy Performance Standards**

EPA is proposing Monitored Natural Attenuation with Institutional Controls as the Final Remedy for the Facility. For groundwater, the groundwater cleanup standards consist of the respective Maximum Contaminant Levels (MCLs) promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300 g-1, for the constituents Benzene and Toluene. Sartomer will be required to sample the monitoring well network in accordance with the December 2001 Quality Assurance Project Plan (QAPP) and Section 4 of the FLP Work Plan presented in August 2001, with the exception of the November 21, 2007 approved monitoring network and once-per-five quarter frequency. Any modification to the sampling will have to be approved by the EPA prior to implementation.

For soil, the ICs restrict the use of the property to industrial/commercial and require that soils from the property shall not be moved unless treated as waste or handled according to the Pennsylvania Management of Fill Policy (25 PA. Code Chs. 271 and 287). If Sartomer decides to perform additional investigations and/or remediation of the contaminated soil, the cleanup standards will consist of the respective EPA Industrial Risk Based Concentrations (RBCs) for the constituents Benzene and Toluene. If Sartomer decides to remediate the contaminated soil to residential or non-restricted use, the cleanup standards will consist of the respective EPA Residential RBCs for the constituents Benzene and Toluene.

#### **V. Evaluation of EPA's Proposed Remedy Selection**

This section provides a description of the criteria EPA used to evaluate the proposed remedy consistent with EPA guidance. The criteria are applied in two phases. In the first phase, EPA evaluates three remedy threshold criteria as general goals. In the second phase, for those remedies which meet the threshold criteria, EPA then evaluates seven balancing criteria to determine which proposed remedy alternative provides the best relative combination of attributes.



## A. Threshold Criteria

EPA's evaluation of the threshold criteria is as follows:

**1. Protect Human Health and the Environment** - EPA is satisfied with the determination that Monitored Natural Attenuation with ICs is, and will be, protective of human health and the environment. There are no human health threats associated with domestic uses of the contaminated groundwater originating from the Facility because groundwater is not used for drinking water purposes. In addition, due to biological activity, the contaminants in the groundwater at the Facility are being decomposed rapidly enough to prevent the contaminants from migrating from the Facility.

Even though there are no current consumptive uses of Facility-contaminated groundwater, it is EPA's goal that groundwater be restored to drinking water standards to be protective of potential future use. Until groundwater is restored to drinking water standards, EPA is proposing to require ICs, as necessary, to prevent consumption of the groundwater.

**2. Attainment of Media Cleanup Standards** - The proposed Monitored Natural Attenuation with ICs will attain the media cleanup criterion by restoring groundwater to drinking water standards. Under EPA's proposed remedy, Sartomer will be required to monitor groundwater until the concentration of each constituent does not exceed the constituent's respective MCL promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1, for three consecutive years.

Sartomer will sample the approved monitoring well network at a once-per-five quarter frequency in accordance with the November 21, 2007 plan and procedures presented in the December 2001 QAPP and Section 4 of the FLP Work Plan. Any modification to the sampling requirements will have to be approved by the EPA prior to implementation.

**3. Controlling Source of Releases** - Since Sartomer ceased using Benzene in its operations in 1989, that source has been eliminated. Additionally, due to the condition of some of the underground lines (specifically a leaking product line taken out of service), overhead lines were installed. Several attempts have been made to identify subsurface sources at the Facility but have been inconclusive. Past releases, floating LNAPL, and LNAPL remaining in the soil pore space above the water table were the most probable sources. To address these, investigations and remedial efforts are believed to have eliminated or controlled these sources. Monitoring data have shown significant reductions in concentrations and LNAPL to the point where no measurable amount of LNAPL has been found since 1997 and VOC concentrations at the downgradient facility boundary are non-detect.

## B. Balancing/Evaluation Criteria

**1. Long-Term Reliability and Effectiveness** - The long-term reliability and effectiveness standard is intended to address protection of human health and the environment over the long term. Sartomer has demonstrated that, due to biological activity, the contaminants in the groundwater are decomposing rapidly enough to prevent the contaminants from migrating

beyond the Facility boundary as has been shown in the 22 August 2007 Natural Attenuation Evaluation Results Report approved by EPA on November 21, 2007. Sartomer will continue to monitor the groundwater to demonstrate that this attenuation process continues until the groundwater cleanup standards are met.

**2. Reduction of Toxicity, Mobility or Volume of Waste** - For this criterion, remedies that employ treatment and/or source removal and containment that are capable of permanently reducing the overall risk posed by the remediation wastes are preferred. Natural attenuation, by definition, refers to a system where a variety of physical, chemical, or biological processes act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. EPA's proposed remedy will, therefore, accomplish this criterion.

**3. Short-Term Effectiveness** - The proposed remedy is expected to meet the short-term effectiveness criterion. The short-term effectiveness criterion is intended to address hazards posed during the implementation of the remedy. Short-term effectiveness is designed to take into consideration the impact on site workers and nearby residents during construction before the final cleanup levels are met. The only possible exposure to groundwater at the Facility is to workers taking environmental samples or to workers excavating soil in the vicinity of the contaminated plume. Sartomer will be required to submit a Health and Safety Plan to EPA that provides for proper worker training and the wearing of protective clothing if exposure to contaminated groundwater is expected.

**4. Implementability** -. The proposed remedy is fully implementable. The implementability criterion addresses the regulatory constraints in employing the cleanup approach. Natural attenuation has been proven to be occurring at the Facility due to naturally occurring microbes. All necessary components of the monitoring network are in place and are currently operational; therefore, no new regulatory constraints are anticipated.

**5. Cost** - EPA's overriding mandate under RCRA is protection of human health and the environment. However, cost is an appropriate consideration that EPA is permitted to weigh when selecting among alternatives that achieve the cleanup requirements. EPA's experience in the Superfund program has shown that in many cases several different approaches will offer equivalent protection of human health and the environment, but may vary widely in cost. All necessary components of the monitoring network at the Facility are in place and are currently operational. The only recurring costs are operational and maintenance and reporting costs of the monitoring network. Therefore, natural attenuation is a cost effective remedy for the Facility.

**6. Community Acceptance** - Sartomer currently meets with a Community Advisory Panel to foster an open dialogue, an exchange of ideas, better understanding and cooperation between Sartomer and the surrounding community regarding plant health, safety, and environmental protection programs. There have been no known conflicts with regards to the remediation efforts and community acceptance. The complete Community acceptance of EPA's proposed remedy will be evaluated based on comments received during the public comment period and will be described in the FDRTC.

7. **State Acceptance** - PADEP has been involved with the actions of the Facility jointly with the EPA. PADEP has been copied on all correspondence and reports and was contacted on February 3, 2009 and offered the opportunity to comment; the indication was that the proposed remedy would be acceptable.

## **VI. Public Participation**

EPA is requesting comments from the public on its proposal that Monitored Natural Attenuation with Institutional Controls become the Final Remedy at the Sartomer Company, Incorporated facility in West Chester, Pennsylvania. The public comment period will last thirty (30) calendar days from the date that this SB is published in a local newspaper. Comments should be submitted by mail, fax, e-mail, or phone to the addresses listed below.

A public hearing will be held upon request. Requests for a public hearing should be made to Mr. Kevin Bilash of the EPA Regional Office (215-814-2796). A hearing will not be scheduled unless requested.

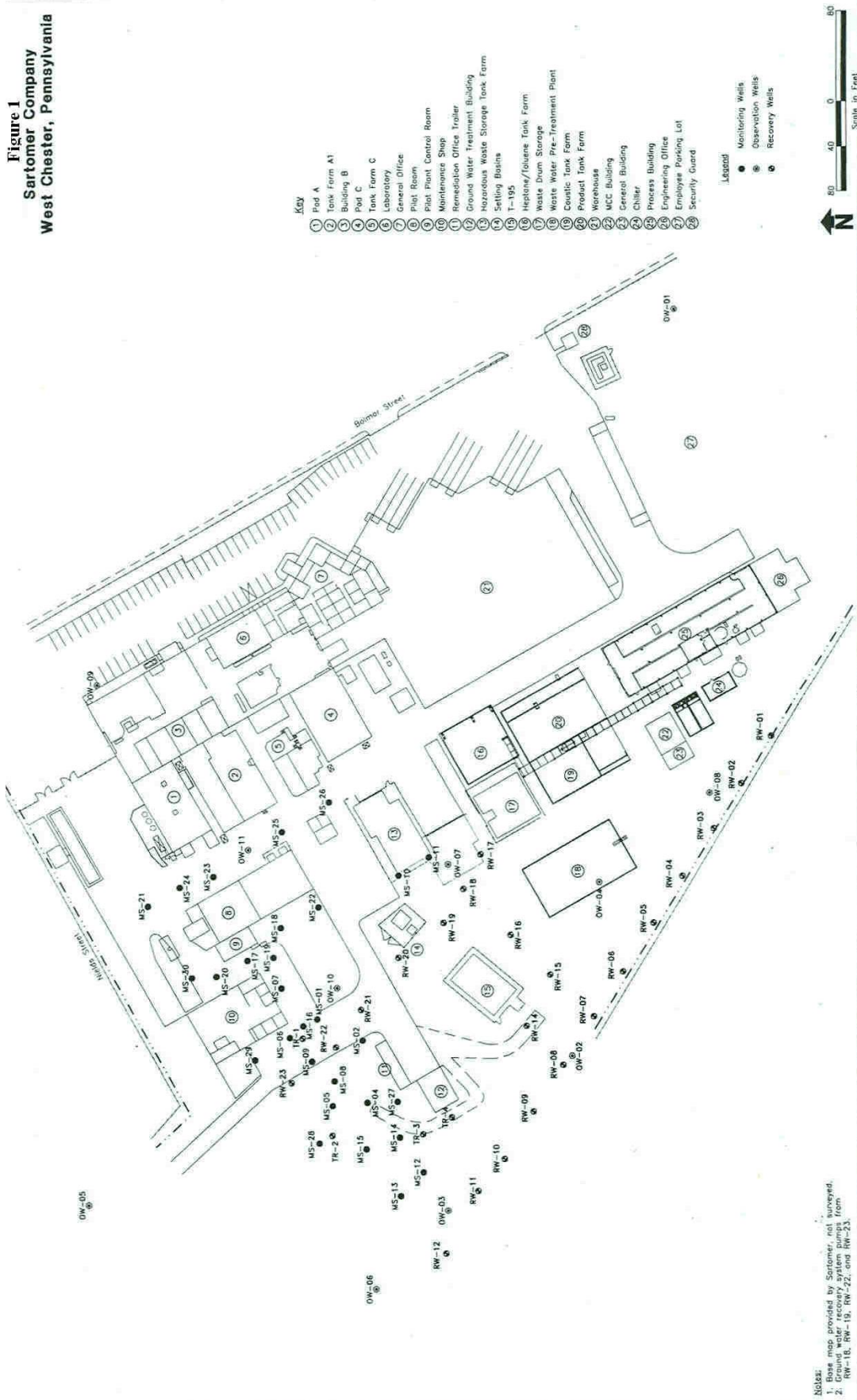
The Administrative Record contains all information considered by EPA when making this proposal of Monitored Natural Attenuation and Institutional Controls at the Facility. The Administrative Record is available at the following location or from the contact listed below:

U.S. EPA Region III  
1650 Arch Street  
Philadelphia, PA 19103  
Contact: Mr. Kevin Bilash (3LC30)  
Phone: (215) 814-2796  
Fax: (215) 814 - 3113  
Email: [bilash.kevin@epa.gov](mailto:bilash.kevin@epa.gov)

After evaluation of the public's comments, EPA will prepare a Final Decision and Response to Comments that identifies the final selected remedy. The Response to Comments will address all significant written comments and any significant oral comments generated at the public meeting, if requested. This Final Decision and Response to Comments will be made available to the public. If, on the basis of such comments or other relevant information, significant changes are proposed to be made to the corrective measures identified by EPA in this SB, EPA may seek additional public comments.



**Figure 1**  
**Sartomer Company**  
**West Chester, Pennsylvania**



**Figure 2**  
**Location of Remediation Areas**  
**Sartomer Company**  
**West Chester, Pennsylvania**

