



STATEMENT OF BASIS

**Former Elf Atochem North America Facility
2375 State Road
Bensalem Township, PA 19020**

**EPA ID#: PAD002290823
September 13, 2006**

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I. INTRODUCTION

This Statement of Basis was prepared for the Former Elf Atochem North America, Inc. Facility (the Facility) located in Bensalem Township, Bucks County, PA. The Facility is currently owned by Bensalem Redevelopment, L.P. (“BRLP”), which is planning to redevelop the site into a mixed residential/commercial property after cleanup activities are completed. The Facility is required to perform corrective action activities because it is subject to the provisions of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (“RCRA”), and the Hazardous and Solid Waste Amendments of 1984 (“HSWA”), 42 U.S.C. §§ 6901 - 6992. Section 3013 of RCRA, 42 U.S.C. § 6934, requires facilities such as the Former Elf Atochem North America, Inc. Facility to investigate and clean up releases of hazardous wastes or hazardous constituents that have occurred at their facilities. This document explains the corrective measures proposed by the Environmental Protection Agency (EPA) given the current environmental conditions at the Facility. This document also summarizes the activities that BRLP performed under its Facility Lead Agreement with EPA.

In addition to its intent for cleanup activities to comply with all RCRA Corrective Action requirements, BRLP is also seeking a release from liability under the Pennsylvania Department of Environmental Protection’s (“PADEP’s”) Voluntary Cleanup Program (“VCP”) under the authority of Act 2. In April 2004, EPA Region III and PADEP entered into a One Cleanup Program Memorandum of Agreement (“MOA”). The MOA facilitates the implementation of the VCP and promotes the One Cleanup Program initiative by minimizing duplication of effort at properties subject to RCRA and ensures the remediation of such properties in a timely fashion. The MOA describes the circumstances in which EPA will use Final Reports submitted pursuant

to the VCP of Act 2 to issue final decisions regarding corrective action completions at certain facilities.

Under the Facility Lead Agreement, BRLP completed the tasks required in the EPA-approved Act 2 Plus Remedial Investigation/Site Characterization Work Plan, which was analogous to a RCRA Facility Investigation (“RFI”) Workplan. The Work Plan presented a methodology to evaluate the nature and extent of releases of hazardous wastes and/or hazardous constituents at or from the Facility.

BRLP submitted the results of the environmental investigation associated with the Act 2 Plus Remedial Investigation/Site Characterization Work Plan in a Remedial Investigation/Risk Assessment (“RI/RA”) Report dated May 13, 2004. After receiving EPA’s comments on the RI/RA Report, additional environmental investigatory work was performed and a Final Characterization Report was submitted to EPA on November 23, 2004. EPA reviewed this report and provided comments to BRLP in correspondence dated February 22, 2005. On June 7, 2005 BRLP submitted a response to EPA’s comments on the Final Characterization Report and on October 21, 2005 BRLP submitted a Remedial Action Workplan (RAWP) for the Facility. EPA provided its comments on the RAWP on December 20, 2005 and BRLP submitted its response to those comments on March 23, 2006. After further discussions, EPA approved of the

RAWP on May 16, 2006. The approved RAWP contains EPA’s proposed corrective measures for the Facility. All of the abovementioned reports and documents, as well as other relevant information, can be found in the Administrative Record, which the public is encouraged to review. The Administrative Record is available at two locations identified in Section VII, Public Participation, of this document.

EPA welcomes public comment on its proposed corrective measure. Public participation is an important component of the corrective measures selection process. Public comments may influence EPA’s final selection of a corrective measure. If new information or options are presented to EPA through public comments, EPA will address these comments and may modify the proposed corrective measure or select another remedy. EPA will select a final remedy for the Facility after information submitted during the public comment period has been considered.

II. FACILITY BACKGROUND

The approximately 25-acre site property is located along the Delaware River in Cornwells Heights, Bensalem Township, PA. Figure 1-1 provides a Site Location Map. The site was first developed by a concrete shipbuilding company in 1917. This company reportedly went out of business shortly after World War I. The next known operator at the site was the Penn Salt Refining Company, which purchased the property in 1940 and used it primarily for warehousing of its products. From 1943 through the end of World War II, the U.S. Government owned the

Facility and used the property for sulfuric acid, hydrogen fluoride and cryolite production, as well as aluminum refining. Penn Salt, which later became the Pennwalt Corporation, repurchased the property from the U.S. Government shortly after the war.

Site operations under Pennwalt Corp. included the blending of chemicals for cleaning and lubricating agents used in the laundry and metal working industries, and the repackaging of bulk materials such as refrigerants and hydrochloric acid. These activities continued from the 1950s through the 1990s. In December 1989, Atochem became the owner of the property after a merger with Pennwalt and another company, M&T Chemicals. In 1997, all manufacturing operations were terminated, equipment was removed from the property and the buildings were decommissioned.

A pH neutralization treatment system was installed at the Facility in 1972 to treat the process wastewater that was previously pumped into two retention ponds in the undeveloped portion of the property. The ponds, constructed in approximately 1950 with no engineered liners, did not have a discharge point so any liquids pumped into the ponds were allowed to evaporate or percolate into the ground. Prior to the construction of the ponds, process wastewater was discharged into an Infiltration Ditch, located along the western property boundary. Both the Former Retention Pond and the Infiltration Ditch have been found to contain contaminants in excess of the PADEP residential Medium Specific Concentrations (MSCs)

Other areas of concern (AOCs) identified by former employees or from previous investigations and found to contain exceedances of PADEP residential MSCs include a Stormwater Drainage Channel, Surface Depression Area, Railroad Spurlines, Former Aboveground Storage Tank (AST) Area, Former Septic Field, Former Forane Storage/Loading Area, Former Gasoline UST Dispenser Area, Soils Adjacent to Building Nos. 2 and 3, the Shallow Soils/Fill on Western Portion of Site, and the MW-10 Vicinity Hot Spot Area. Further descriptions of these AOCs can be found in the reports contained in the Administrative Record for the Facility.

III. PREVIOUS INVESTIGATIONS

Numerous environmental investigations and remedial activities have been conducted at the Facility since the mid-1980's. In 1985, a hydrogeologic investigation to determine the groundwater conditions downgradient of the two former Retention Ponds included the installation of four wells. This study found that groundwater samples collected from one of the downgradient wells (MW-4) had the highest concentrations of VOCs (tetrachloroethylene (PCE) at 1,200 ug/l and trichloroethylene (TCE) at 110 ug/l). In May 1992, Atochem excavated and disposed of raw sulfur observed on the ground surface near the Former Sulfur Storage Area, adjacent to the Canal and Delaware River.

In November 1992, three underground storage tank (UST) systems and associated impacted soils were removed from the production area of the Facility. In December 1993, potential impacts to groundwater from the releases discovered during the UST removals were investigated. Although

total petroleum hydrocarbons (TPH) were detected in groundwater samples collected from monitoring wells downgradient of the No. 4/6 fuel oils UST, and TPH and BTEX compounds (benzene, toluene, ethylbenzene and xylene) were detected in groundwater samples collected from wells downgradient of the gasoline UST, it was concluded that the contamination found was localized, there was not a complete pathway for human exposure, and the contamination would likely attenuate over time. Further monitoring of the UST-associated wells between July 1994 and April 1995 supported the above conclusions.

In 1995, Atochem performed a Remedial Investigation (RI) at the Facility, which focused on the conditions in the undeveloped portion of the site including the former Retention Ponds. The study found that the Former Retention Ponds extend to a depth of nine feet and contain fill materials such as railroad ties, pallets, plastic, crushed drums, gas cylinders and general scrap iron. Soil samples collected from the former Retention Ponds were found to contain elevated concentrations of arsenic, lead and beryllium. A groundwater sample collected from a monitoring well downgradient of the former Retention Ponds (MW-4R) contained total VOCs in the 8,000 to 9,000 ug/l range.

Benzo(a)pyrene was detected at elevated concentrations in surface soils collected from the former Infiltration Ditch. Surface water samples collected from the Infiltration Ditch were found to contain a polychlorinated biphenyl (PCB) compound (Aroclor-1254), arsenic, copper, iron and lead at elevated concentrations. Soil samples collected from the Surface Depression area reportedly contained elevated beryllium concentrations and surface water samples collected within this area of concern contained elevated levels of copper, iron and lead.

In 1997, a hydrogeologic investigation was conducted at the site to evaluate the potential impacts to groundwater related to the former Retention Ponds, the former Sulfur Storage Area, the Surface Depression area, and the former gasoline UST. Elevated concentrations of chlorinated VOCs were detected in MW-4, downgradient of the former Retention Ponds, and MW-7 near the former gasoline UST. The contamination detected at these locations was not believed to be part of the same plume.

In October 1997, a 13,500-gallon tank was reportedly removed from the southwestern portion of the Canal. The tank is believed to have stored fuel oil for barges in the early to mid 1900s. Samples of sludge collected from within the tank were found to contain 8,800 mg/kg of TPH but no BTEX compounds were detected. The embankment was restored with rip-rap.

In September 2002, a test pit characterization of the former Retention Ponds was completed as well as a study of the sediments in the Canal. Soil samples collected from the test pits were found to contain elevated concentrations of methylene chloride, antimony, iron, aluminum, arsenic mercury, manganese, nickel, thallium, vanadium, zinc and PCB (Aroclor – 1254). The single “grab” groundwater sample collected from the west retention pond contained PCE (3 ug/l), TCE (4 ug/l), cis-1,2-dichloroethylene (cis-1,2-DCE) (80 ug/l), arsenic (14 ug/l), lead (91 ug/l) and PCB Aroclor-1254 (13 ug/l). Canal sediments were found to contain elevated concentrations of 1,1-dichloroethane, carbon disulfide, acetone, aluminum, arsenic, cadmium, chromium, copper, iron, mercury, manganese, nickel, lead zinc, bis(2-ethylhexyl)phthalate, fluorine, pyrene,

PCB (Aroclor – 1254), 4,4'-DDD, 4,4'-DDE and 4,4'-DDT.

IV. SUMMARY OF THE RI/RA AND FINAL CHARACTERIZATION REPORTS

The RI/RA and Final Characterization Reports summarized the work that had been completed under the Act 2 Plus Remedial Investigation/Site Characterization Work Plan. The work plan called for the further study of many of the areas of concern that were previously investigated and included the collection and analyses of soil, groundwater, surface water and soil gas samples.

A) Soil Investigation

A total of 96 subsurface soil samples (>2 feet below the ground surface (BGS)) and 24 surface soil samples (< 2 feet BGS) were collected from 63 soil borings installed as part of the Act 2 Plus Characterization. The Final Characterization sampling event included the collection of an additional 54 surface soil samples and 20 subsurface soil samples.

Based on the analytical results associated with the above sampling and previous site investigations, twelve (12) AOCs were determined to require remediation due to exceedances of Act 2 residential MSCs. Two additional AOCs will be remediated by the site developer for other reasons. The stained soils along the former No. 4/6 Fuel Oil Pipe will be removed although there were no soil analyte concentrations above MSCs for this AOC. The shallow soils of the former Sulfur Storage Area will be remediated by adjusting (raising) the pH, although no MSC exceedances were found in soil samples collected from this AOC. No soil characterization has been completed to date for the two existing electrical transformer areas. Once the transformers are removed from the site, the soils in these areas will be characterized for PCB contamination and remediation will be conducted if necessary. The table below contains a list of the remaining AOCs and the contaminants detected in soil samples collected from those AOCs at concentrations above the Act 2 residential MSCs.

Area of Concern	Contaminant(s) detected in soils above PADEP Act 2 residential MSCs*
Shallow Soils/Fill on Western Portion of Site	Arsenic
Railroad Spurlines	Benzo(a)pyrene, PCBs (Aroclor-1254*, Aroclor-1260)
Stormwater Drainage Channel	Arsenic
Surface Depression Area	Arsenic, Iron, Vanadium
Infiltration Ditch	Benzo(a)anthracene, Benzo(a)pyrene, Dieldrin, PCB Aroclor-1254*, Arsenic)
Soils Adjacent to Building Nos. B-2/B-3	Benzo(a)pyrene, Dibenzo(a,h)anthracene, Arsenic, Iron, Lead
Former Retention Ponds	1,1-Dichloroethane, Methylene Chloride, BHC-alpha, PCB Aroclor-1254*, Arsenic, Lead, Nickel
Former Aboveground Storage Tank Area	Tetrachloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,3-Dichloropropane
Former Septic Field	Arsenic
Hot Spot in MW-10 Vicinity	Tetrachloroethylene

Former Forane Storage Area	Lead
Former Gasoline UST – Dispenser Area	Benzene
* Includes PCB (Aroclor-1254) concentrations above 1.56 mg/kg, which corresponds to a Hazard Index of 1.0. The Act II MSC for PCB (Aroclor-1254) is 4.4 mg/kg.	

B) Groundwater Investigation

The site is underlain by silty sand beneath surficial fill or topsoil with natural organic material. Thin silty clay layers occur at various locations throughout the site. A sand and gravel unit is found in most areas beneath the silty sand and silty clay. The lithology of this unit is generally consistent with the Trenton Gravel Formation. Beneath the Trenton Gravels is a weathered and micaceous bedrock saprolite which varies in thickness from 2.5 feet to 21 feet across the site. The bedrock beneath the site is believed to be part of the Wissahickon Schist Formation. Outcrops of this formation are apparent along the edge of the riverbed. Depths to competent bedrock at the site range from approximately 10 to 14 feet BGS on the northwest side of the site to 30 feet BGS in the wooded flood plain portion of the site.

The site is located near the boundary of the Atlantic Coastal Plain and Piedmont Plateau. The Coastal Plain, a wedge-shaped sequence of unconsolidated to semi-consolidated sedimentary deposits that thicken towards the Atlantic Ocean, contains the Potomac-Raritan-Magothy (PRM) aquifer system, an important source of drinking water for southern New Jersey. To confirm the Coastal Plain is not present beneath the site, boring logs in the site vicinity were examined that documented the unconsolidated units in the area consist of Trenton gravel, not PRM deposits.

Groundwater in the unconsolidated deposits is not considered to be a significant source of water, but can be developed where the sand and gravel lenses are sufficiently thick. Groundwater is also present in the saprolite and consolidated Wissahickon Schist Formation below the overburden. No continuous confining layer has been identified between the overburden, saprolite, or bedrock aquifers.

Groundwater flow direction in the overburden and saprolite is generally towards the Delaware River or the Canal along the northern site property boundary. The pumping of two sumps located within Building B-3 may be affecting the natural groundwater flow gradient, possibly drawing water from beneath the former Retention Ponds away from the Delaware River and towards Building B-3.

Five new monitoring wells and eleven new temporary monitoring wells were installed in January 2004 as part of the Act 2 Plus Remedial Investigation/Site Characterization. Eleven existing wells were chosen in addition to the new wells (27 wells total) to comprise the groundwater monitoring program at the site. Of the 27 wells, 21 are screened into the overburden and six are screened into the saprolite aquifer. The eleven existing wells were sampled in December 2003. The results from this sampling event were used to decide the locations of the new temporary and

permanent monitoring wells. The five new monitoring wells and eleven new temporary monitoring wells were sampled in February 2004. All 27 of the wells in the monitoring program were resampled in May 2004 as part of the Final Characterization.

The December 2003 and February 2004 sampling results indicate the highest concentrations of chlorinated solvents (PCE (680 ug/l), TCE (380 ug/l), 1,1-DCE (50 ug/l), cis-1,2-DCE (1800 ug/l), and vinyl chloride (850 ug/l)) were detected in MW-4D, located downgradient of the former Retention Ponds. Interestingly, the chlorinated solvent contamination historically seen in overburden monitoring well MW-4 was not detected in this round of groundwater sampling. Elevated concentrations of chlorinated organics were also detected in samples collected from monitoring wells adjacent to Building Nos. B-2/B-3 and B-5, as well as in water samples collected within the North and South sumps within Building No. B-3. A groundwater sample from temporary well TW-10 located adjacent to the Canal exhibited a PCE concentration of 200 ug/l indicating that the contaminant plume was most likely discharging into the Canal at elevated concentrations. PCE, TCE, vinyl chloride and cis-1,2-DCE were all found at concentrations above the tap water RBC and PADEP residential used aquifer groundwater MSC but below the PADEP residential non-used aquifer MSC in several of the wells located near the bank of the Delaware River. Elevated (above the residential used aquifer MSC) concentrations of metals including antimony, beryllium, lead, mercury nickel and thallium were found in at least one of the monitoring wells during this round of sampling as well.

The May 2004 groundwater sampling results again indicate the highest concentrations of chlorinated solvents (PCE (620 ug/l), TCE (330 ug/l), cis-1,2-dichloroethylene (1,900 ug/l), 1,1-DCE (14 ug/l) and vinyl chloride (1,000 ug/l)) were detected in MW-4D. Monitoring well MW-4 was also found to contain chlorinated organics in line with historical sampling data (PCE (23 ug/l), TCE (71 ug/l), cis-1,2-DCE (500 ug/l) and vinyl chloride (410 ug/l)). The samples collected from the other wells correlated well with the samples collected in December 2003 and February 2004 from the same locations.

The Final Characterization also included the collection of six grab groundwater samples using a Geoprobe direct push drilling rig. These samples were collected to determine whether the VOC plumes located northwest of the Retention Ponds and in the vicinity of monitoring well MW-7 near the Canal were connected. The analytical results associated with the grab groundwater sampling documented that the two plumes were separate.

C) Surface Water Investigation

Stormwater runoff from the site and groundwater beneath the site discharge directly into the Delaware River or into the Canal located along the northern boundary of the site. The Canal and river also receive stormwater and groundwater from off-site sources and the Canal itself, being tidally influenced, receives water from the Delaware River as well. Therefore, it is difficult to attribute contamination found in these water bodies solely to a particular former Facility related operation. The Delaware River is used as a source of drinking water by the Philadelphia Water Department (PWD) at its Samuel Baxter Water Treatment Plant located approximately 3.5 miles

downstream of the Facility. This treatment plant provides drinking water to roughly 60% of the residents of Philadelphia as well as some Lower Bucks County residents.

Surface water in the Canal was characterized through the collection of five samples in January 2004. While laboratory estimated concentrations of several VOCs including TCE, PCE and 1,1-DCE were detected primarily in the two most upstream samples, none of the contaminants were detected above EPA's maximum contaminant levels (MCLs). TCE and PCE were detected at concentrations greater than EPA's tap water RBCs but below PADEP's Surface Water Criteria for Human Health (SWCHH) at the two most upstream sample locations. The only contaminants detected at concentrations greater than the PADEP SWCHH in the Canal water were zinc and bis-(2-ethylhexyl)phthalate. The bis-(2-ethylhexyl)phthalate detection is most likely due to laboratory contamination as the field blank associated with the surface water sampling event also contained this contaminant at a similar concentration. Zinc has not been identified as a contaminant of concern at the site as a result of the extensive amount of environmental sampling that has occurred so its presence in the Canal is not likely attributable to historical site activities.

Although surface water samples have not been collected from the Delaware River along the shoreline of the Facility property, the trace concentrations of VOCs found in groundwater samples from wells along the shoreline are not believed to have an impact on the Delaware River. Preliminary modeling using the SWLOAD5 and PENTOXSD models indicate that even the maximum concentrations of all contaminants detected in groundwater historically at the site would not cause an exceedance of any applicable surface water criteria in the Delaware River.

To assess sediment quality at the site, five sediment samples were collected from the Canal in September 2002. Several VOCs, PAHs, pesticides, a PCB (aroclor-1254), and inorganic constituents were detected in the sediment samples. The analytical results were compared to the EPA residential soil RBCs multiplied by a factor of 10, the current practice being utilized by EPA Region III for screening purposes for human health direct contact. No contaminants in any of the sediment samples were detected at a concentration above the modified residential soil RBCs. Sediment quality along the shoreline of the Delaware River has not been physically characterized but is not expected to be impacted to a greater extent than the Canal sediments.

D. Indoor Air Investigation

Several contaminants of indoor air quality concern have been detected in soil and groundwater samples collected at the site. An initial study of the potential exposure to indoor air contamination was completed as part of the RI/RA Report. The study used the procedures contained in PADEP's "Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard," a final document dated January 24, 2004.

For the vapor intrusion evaluation for soil, a contractor for BRLP assumed a residential exposure scenario and conservatively used the maximum historical concentration of VOCs and SVOCs detected in soil samples collected at the site. Site specific modeling using the EPA approved Johnson & Ettinger Model was used for all constituents that had maximum concentrations above

the PADEP residential soil to groundwater used aquifer MSC and any other contaminants detected above the PADEP Default Residential Volatilization to Indoor Air Screening Value contained in Table 4 of the State Guidance. The results of the site specific modeling indicated that the following soil contaminants had the potential to pose an unacceptable indoor air vapor intrusion risk to human health: benzene, 1,1-dichloroethane, trans-1,2-DCE, cis-1,2-DCE, 1,3-dichloropropene, ethylbenzene, PCE, vinyl chloride and xylenes (total).

For the vapor intrusion evaluation for groundwater, the BRLP contractor assumed a residential exposure scenario and conservatively used the maximum historical concentration of VOCs and SVOCs detected in groundwater samples collected at the site. All of the compounds with maximum concentrations below the PADEP residential used aquifer MSCs were screened out of the vapor intrusion pathway as those concentrations were also below the PADEP Default Nonresidential Volatilization to Indoor Air Screening Values contained in Table 1 of the State Guidance. For those contaminants with maximum concentrations greater than the PADEP residential used aquifer MSCs, site specific modeling using the Johnson & Ettinger Model was employed. The results of the site specific modeling indicated that the following groundwater contaminants had the potential to pose an unacceptable indoor air vapor intrusion risk to human health: cis-1,2-DCE, PCE, TCE, and vinyl chloride.

As part of the Final Characterization six soil gas samples were collected to address the potential impact of contaminated groundwater and site soils on indoor air quality. The VOC concentrations from the samples were compared to PADEP's residential soil gas MSCs. Four of the six samples contained at least one VOC (PCE, TCE, and/or chlorobenzene) at concentrations in excess of the MSCs.

E. Ecological Risk Assessment

An ecological screening was conducted as part of the May 2004 RI/RA Report. This screening relied on the results of a previous baseline ecological assessment that was performed at the Facility in 1995. The assessment consisted of a professional field survey of the on-site undeveloped area near the Delaware River and concluded that no indications of ecotoxicological impacts were observed. The wetlands observed in the undeveloped/wooded area near the river exhibited no signs of environmental impact due to site-related activities. No rare, threatened or endangered species were observed on the site during the field survey.

At the request of EPA, BRLP conducted a new site-wide wetland boundary survey in the summer of 2005. Wetland areas were identified along the banks of the Canal and Stormwater Drainage channel, as well as in a few areas within the five-acre wooded portion of the site near the Delaware River. Wetlands in the Stormwater Drainage Channel, former Septic Field and Surface Depression AOCs will need to be disturbed during site cleanup activities. The affected wetland areas will be fully restored post-remediation per U.S. Army Corps of Engineers Nationwide Permit No. 38.

Also at the request of EPA, BRLP conducted an ecological inspection of the Canal in July 2005 since it was not included in the 1995 study. The assessment included qualitative observations of fish and wildlife in the area as well as surface water depth/flow and channel substrate characteristics. The Canal habitat was determined to have “poor habitat value” in accordance with EPA’s 1995 guidance entitled “Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition.”

V. **PROPOSED FINAL REMEDY**

BRLP submitted a Remedial Action Workplan (RAWP) to EPA and PADEP on October 21, 2005. The RAWP presented the scope of the remedial actions proposed at the site and sought the approval of EPA and PADEP under the One Cleanup Program MOA. EPA provided its comments on the RAWP to BRLP on December 20, 2005 and BRLP provided its response to those comments in correspondence dated March 23, 2006. After a May 10, 2006 meeting between EPA, PADEP and BRLP at EPA’s offices to discuss the few remaining issues associated with the RAWP, EPA approved of the Workplan in correspondence dated May 16, 2006. BRLP plans to implement the RAWP in August 2006. Until a Final Remedy is issued by EPA, any remedial work performed by BRLP will be considered to be interim measures. EPA expects that the Final Remedy will be equivalent to the approved RAWP; however, EPA is requesting and will review and respond to any comments from the public on the proposed corrective action for the Former Elf Atochem North America Facility. Below is a description of the proposed remedial actions contained in the RAWP

A. **Soils Remediation**

The RAWP proposed remedial action for site soils in order to attain PADEP Act 2 residential MSCs at 12 AOCs identified at the Facility through historical site investigations. The Act 2 residential MSCs are largely consistent with EPA Region III’s Risk Based Concentrations (RBCs) in their level of protectiveness. However, the MSC for one contaminant (PCB (Aroclor-1254)) detected in several AOCs at the Facility, corresponds to a Hazard Index (HI) greater than 1.0, EPA’s maximum allowable HI. BRLP has agreed that no residential areas of the site will have a Hazard Index greater than 1.0 post-remediation. A concentration of 1.56 mg/kg of PCB (Aroclor-1254) correlates with an HI of 1.0 (the Act 2 MSC is 4.4 mg/kg). Therefore, the maximum allowable concentration of PCB (Aroclor-1254) in any residential area will be 1.56 mg/kg in surface soils (0 to 2 feet below the ground surface).

The remedy proposed for contaminated soils at the site is removal and off-site disposal. The table below presents the estimated volumes of soils to be removed at each of the AOCs known to contain soil contamination at levels above the PADEP Act 2 residential MSCs. Figure 3-1 in the RAWP, a copy of which is attached in this Statement of Basis, presents the areal extent of the soil removals at each of the AOCs.

Area of Concern	Contaminant(s) detected in soils above residential MSCs*	Estimated Volume of Contaminated Soil (yd³)
Shallow Soils/Fill on Western Portion of Site	Arsenic	5,438
Railroad Spurlines	Benzo(a)pyrene, PCBs (Aroclor-1254, Aroclor-1260)	1,809
Stormwater Drainage Channel	Arsenic	464
Surface Depression Area	Arsenic, Iron, Vanadium	1,015
Infiltration Ditch	Benzo(a)anthracene, Benzo(a)pyrene, Dieldrin, PCB Aroclor-1254, Arsenic)	1,747
Soils Adjacent to Building Nos. B-2/B-3	Benzo(a)pyrene, Dibenzo(a,h)anthracene, Arsenic, Iron, Lead	2,316
Former Retention Ponds	1,1-Dichloroethane, Methylene Chloride, BHC-alpha, PCB Aroclor-1254, Arsenic, Lead, Nickel	13,350
Former Aboveground Storage Tank Area	Tetrachloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,3-Dichloropropane	237
Former Septic Field	Arsenic	1,573
Hot Spot in MW-10 Vicinity	Tetrachloroethylene	1,554
Former Forane Storage Area	Lead	54
Former Gasoline UST – Dispenser Area	Benzene	18
* Includes PCB (Aroclor-1254) concentrations above 1.56 mg/kg, which corresponds to a Hazard Index of 1.0. The Act II MSC for PCB (Aroclor-1254) is 4.4 mg/kg.		

All of the removed soils, with the possible exception of the former Retention Pond soils will be transported off-site for treatment/disposal. Soils associated with the former Retention Ponds will be remediated through a combination of off-site disposal and the relocation of soils to the non-residential portions of the site. The entire former Retention Ponds area will be remediated to attain Act 2 residential standards. Any debris and soils within the ponds that exceed Act 2 non-residential standards will be disposed off-site. Soils within the former Retention Ponds that meet the Act 2 non-residential standards may be retained on-site, under a cap, within areas designated for non-residential use located along the western property boundary. The capping will serve as an additional protective measure to ensure an incomplete exposure pathway since the relocated soils in these non-residential areas will already have met the Act 2 non-residential MSCs. Soil removed from the designated non-residential areas to accommodate the relocated former Retention Pond soils will be sampled and used as fill material at the former Retention Ponds provided that it meets the PADEP Act 2 residential MSCs.

There are two former electrical transformer areas at the Facility that have not been fully characterized to date. BRLP is planning to remove the transformer equipment and concrete pads prior to completing soil characterizations in these areas. Soil samples will be collected in the vicinity of and beneath the concrete pads and will undergo PCB analysis. Any soils found to be impacted above levels corresponding to a Hazard Index of 1.0 will be excavated and disposed off-site.

Outside of the RCRA Corrective Action scope of work, BRLP is planning to raise the pH of the shallow soils contained within the former Sulfur Storage Area and to remove stained soils observed along the piping associated with the former No. 4/6 Fuel Oil UST.

Post-excavation soil sampling will be conducted to verify the effectiveness of the remedial activities and to ensure that the remaining soils/fill satisfy the PADEP Act 2 MSCs and EPA required PCB (Aroclor-1254) concentration limit.

B. Groundwater

Although groundwater beneath the site contains contaminants in excess of residential MSCs, there is no complete exposure pathway via direct contact or ingestion, and the migration of impacted groundwater to surface water has been modeled to document that surface water quality criteria will not be significantly impacted. Therefore, no active groundwater remediation is proposed as part of the Site Remedy.

A long term groundwater monitoring program has been developed and will begin immediately after site development has been completed. The groundwater monitoring program will be comprised of the eight (8) existing wells located along the Canal and Delaware River: MW-2D, MW-2S, MW-11D, MW-12D, TW-6, TW-7, TW-10 and TW-11. The monitoring frequency will be quarterly sampling for the first year following site redevelopment, biannual sampling for the second year and one final round of groundwater sampling at the end of the third year. The groundwater samples will be analyzed for PCE, TCE, vinyl chloride, beryllium, cadmium, lead, nickel and thallium and the analytical results will be compared to the PADEP Act 2 residential, non-use aquifer MSCs. If at the end of the third year (7th round of post-remedial groundwater sampling) the parameters analyzed for have exhibited concentrations below their associated MSCs for at least three consecutive monitoring periods, those parameters at their associated well locations may be removed from the long-term groundwater monitoring program. Conversely, the long-term monitoring program will be extended for any well where groundwater concentrations detected in the 5th, 6th and/or 7th rounds of sampling exceed the MSCs. The long term monitoring program will only be extended for those specific parameters that exceed the MSCs. The extended monitoring frequency after the three-year monitoring program will be decided at the end of the three-year period, but will continue at least until the parameter(s) of concern are detected at concentrations below the MSC for a minimum of three consecutive sampling events.

C. Surface Water/Sediments

No active surface water/sediment remediation is proposed or required as part of the Site Remedy. No site-attributable contaminants were found in the surface water samples collected from the Canal at concentrations exceeding PADEP's Surface Water Criteria for Human Health. No contaminants in sediment samples collected from the Canal exhibited concentrations above the human health direct contact screening levels. The Canal was determined to have a "poor habitat value" in accordance with EPA guidance. Due to the size of the Delaware River and the distance from sources and contaminated groundwater plumes to the river compared to the Canal, no adverse impacts are suspected to have occurred at the river.

D. Indoor Air

Engineering controls will be installed on all structures to be built on the redeveloped site that will provide an effective vapor barrier between any remaining VOC contamination in the subsurface soils/groundwater and the indoor air of those structures. The engineering plans for the controls will be submitted to both EPA and PADEP for approval prior to construction. An institutional control, such as a deed and/or condominium owner acknowledgement, will be utilized to inform prospective buyers of the subsurface conditions and the engineering controls in place to mitigate the risks associated with those conditions.

To establish baseline post-remedial subsurface conditions, one round of post-remedial/pre construction soil gas sampling will be conducted. To monitor post-development subsurface conditions, BLRP will install twelve (12) permanent soil gas sampling points at several locations above and within a reasonable buffer zone of the footprints of the VOC-contaminated groundwater plumes in the vicinity of occupied structures. The sample points will be located beneath hard cover surfaces such as roadways, concrete slabs, hard-capped areas, etc. with the goal of simulating the soil gas concentrations expected to be found beneath the concrete slabs of actual inhabited residential and commercial structures. Some of the sample points will also be located in the permeable fill around utility lines to help assess the potential for vapors to travel along preferential pathways. BRLP will submit a soil gas monitoring plan with sampling frequencies and endpoints based on the cumulative health risk associated with the inhalation of indoor air in on-site structures without any engineering controls (although all on-site structures will be built with some form of a vapor barrier).

VI. **EVALUATION OF PROPOSED REMEDY USING REMEDY SELECTION CRITERIA**

EPA has established a two-phase evaluation system for remedy selection. During the first phase, potential remedies are screened to see if they meet the "threshold criteria" (i.e., is the remedy protective of human health and the environment; does it attain media clean-up standards, control source releases and comply with waste management standards?). Remedy options that meet the threshold criteria are then further evaluated using the "balancing criteria" (i.e., what is the short-term and long-term reliability and effectiveness of the remedy; does the remedy reduce the

toxicity, mobility or volume of wastes; can the remedy be easily implemented; and, is the cost of the remedy commensurate with the scope of the cleanup?).

EPA's proposed remedy meets each of the Threshold Criteria as described below.

A. **Protective of Human Health and the Environment**

The tables in Section Nos. IV and V above detail the various contaminants and estimated volumes of contaminated soils at the 12 AOCs where exceedances of the PADEP residential MSCs were observed. Once the contaminated soil is removed from the site, all of the AOCs will have attained the residential MSCs as well as the more stringent concentration limit for PCB (Aroclor-1254). The MSCs, otherwise known as the Statewide Health Standards, are protective of human health and the environment, and were developed based upon the toxicological and physical properties of the contaminants.

As identified in Sections III and IV above, several VOCs, PCBs, and inorganic constituents have been detected at elevated concentrations in various groundwater sampling events at the Facility over the past 20 years. The most common contaminants observed in groundwater include chlorinated solvents such as TCE, PCE, DCE and vinyl chloride. The greatest concentrations of these contaminants are focused in the central portion of the site between the former Retention Ponds, Building B-3 and Building B-5. Natural attenuation of many of the organic contaminants in the groundwater is expected to occur over time which will mitigate the contaminant concentrations in most locations. Also, the removal of soils at the 12 AOCs with contamination above the PADEP residential MSCs will serve to remove the source of much of the groundwater contamination.

No active groundwater treatment was the selected remedy because there is no complete exposure pathway for groundwater to pose a significant risk to human health or the environment for the following reasons:

- There is no route for direct contact with groundwater. There are no known groundwater springs located on the site property. Any workers involved with remediation, groundwater monitoring or construction will be properly trained and equipped to prevent potential direct contact exposures to contaminated groundwater. Additionally, deed restrictions forbidding future well installation will be included for every parcel of property within the site boundaries.
- Groundwater in the site vicinity and downgradient of the site is not used as a source of potable water. Bensalem Township has an ordinance requiring any occupied buildings within 150 feet of public water facilities to connect to those facilities. The site and surrounding community obtain their drinking water from Aqua America, the local municipal water supply system, which obtains a majority of its supply from a

Philadelphia Water Department surface water intake on the Delaware River located 3.5 miles downstream of the site. Well searches conducted by contractors for BRLP and PADEP identified several private wells within a 1.0-mile radius of the site; however, none of those wells are used for potable purposes and none of those wells are suspected to be impacted by the groundwater contamination observed beneath the site.

- It is not suspected that any site-related contaminated groundwater discharged into the river or Canal will have any impact on the Delaware River or the surface water intake located 3.5 miles downstream of the site property. PADEP's SWLOAD5 and PENTOXSD models indicate that the groundwater discharge to surface water containing the maximum concentrations of all contaminants detected in groundwater historically at the site would not cause an exceedance of any applicable surface water criteria in the Delaware River.
- The groundwater to indoor air pathway for VOCs will be eliminated due to the engineering controls that will be installed on all future structures to be built on-site, or at least until the soil gas sampling program indicates there is no longer a need for engineering controls.

No surface water/sediment remediation is required because surface water is not used as a drinking water source at the site, no exceedances of PADEP's Surface Water Criteria for Human Health have been observed, no exceedances of human health screening levels for sediments have been observed, and the Canal has been classified as having "poor habitat value."

B. Attainment of Media Clean-Up Standards

The proposed remedy includes the cleanup of soils to PADEP residential soil MSC levels in the majority of the site. BRLP has designated two areas along the western border of the site as non-residential areas. BRLP plans to exchange the former Retention Ponds soils that meet the PADEP non-residential soil MSCs with the clean soils currently located in the designated non-residential areas. Since these areas are designated as non-residential, no further engineering controls are required; however, BRLP has agreed to cap these areas with a combination of building foundation, paved surface, and/or two feet of clean fill material as a further conservative measure.

A site-specific approach will be employed for the groundwater contamination that exists beneath the site. While the lack of a complete exposure pathway makes it unnecessary to actively treat groundwater to a State/Federal regulatory standard, the soil source removals and natural attenuation will serve over time to reduce the level of groundwater contamination.

C. Control of the Sources of Releases

Unlike many of the available in situ soil treatment technologies, a soil removal action leaves no

doubt of the effectiveness of the remedy. The contamination is physically removed from the site, and therefore any contamination sources contained within the soils are also removed. Removal of these sources effectively prevents the further release of hazardous constituents to groundwater and eliminates the potential for a complete direct contact exposure pathway.

D. Comply with Waste Management Standards

All activities associated with the implementation of the Site Remedy will be conducted in accordance with all applicable regulations and standards. A Pollution Control and Mitigation Plan will establish measures to prevent or minimize potential releases of hazardous constituents during site remediation activities. The plan will include items such as an Erosion and Sedimentation Control Plan, dust control measures, inspection procedures, decontamination procedures, etc. All materials shipped off-site for disposal will be transported to a disposal Facility that is properly licensed and permitted to accept the particular waste stream. A Health and Safety Plan will be in effect during all site activities ensuring the safety of all on-site workers and visitors.

EPA's proposed remedy meets each of the Balancing Criteria as described below.

E. Long-term Reliability and Effectiveness

The soil removals at the 12 AOCs with PADEP residential soil MSC exceedances will provide a permanent, effective remedy to address the soil contamination at the site and will prevent all future releases of hazardous constituents to groundwater beneath the site. The groundwater and soil gas monitoring programs will confirm the reliability and effectiveness of the remediation and the potential natural attenuation of the VOC contamination in groundwater. As described in Section V above, the groundwater and soil gas monitoring programs will continue until risk based endpoints have been achieved for a significant period of time.

EPA also considers the restriction of on-site groundwater use for any purpose and the Bensalem Township ordinance requiring connection to the public water supply as long-term components of the remedy.

F. Reduction of Toxicity, Mobility, or Volume of Wastes

The soils removal will greatly reduce the volume of hazardous constituents in the soils. Approximately 30,000 yd³ of contaminated soil will be excavated and either disposed of off-site, or in the case of the former Retention Pond soils, may be re-used on-site as fill material in the designated non-residential areas. Future site development with the installation of building slabs, roadways and other impermeable surfaces will reduce percolation of stormwater into the groundwater beneath the site, thereby reducing the mobility of contaminants within the groundwater. Natural attenuation of contaminants in groundwater is also expected to occur over

time serving to further reduce the toxicity, mobility and volume of the hazardous constituents in that medium.

G. Short-Term Effectiveness

The short-term effectiveness of a remedy is related to the risks posed to the community and workers involved in the design, construction and implementation of the remedy. The short-term risks posed by the proposed remedy for the Facility are minimal. During excavation, loading and off-site shipping of contaminated soils, the Pollution Control and Mitigation Plan will be followed. The site is located in a commercial/industrial part of Bensalem Township so no residential communities will be impacted during the remediation effort. Adherence to the Health and Safety Plan will ensure the safety of all on-site workers and visitors by preventing exposures to contaminated soil and groundwater during remediation or post remedial sampling activities. It is also relevant to note that the current levels of soil and groundwater contamination do not represent an immediate threat to anyone who may be exposed during routine sampling or construction activities.

H. Implementability

Implementability includes the technical and administrative feasibility of constructing and operating the proposed remedy. The proposed remedy for the Facility is both technically and administratively feasible. The groundwater monitoring technology and protocol are already in place and have been approved by EPA. The soil gas monitoring program will be further developed as the remediation effort progresses. Further, EPA plans to implement the proposed remedy through a Facility-Lead Agreement with BRLP which will include institutional controls. Under this approach, BRLP will provide EPA a written commitment to complete the steps outlined in the final remedy. In the event that BRLP fails to implement the final remedy as specified in the Facility-Lead Agreement, EPA will take appropriate steps to compel it to perform the necessary work.

I. Cost

The Facility is considered to be a Brownfield property, which is defined by EPA as real property, the expansion, redevelopment or reuse of which may be complicated by the presence of a hazardous substance, pollutant or contaminant. The revitalization of Brownfields eases the pressure to develop open land, which improves and protects the environment.

For Brownfield projects, the time required to complete remediation may be as much of a priority as the cost of the remedy. The goal is to complete the cleanup as quickly as possible in order for the planned redevelopment of the site to proceed. Some of the timeframes associated with the various in situ chemical or biological treatment technologies are uncertain and are dependent on many different variables. A remedy to excavate contaminated soils and dispose of them off-site is often the preferred alternative for a property owner, particularly if the property includes planned residential redevelopment, such as the Former Elf Atochem North America Facility.

The costs for a removal action are typically higher than costs associated with in situ treatment. However, BRLP is committed to financing all of the remediation/post remediation activities as described in the RAWP and this Statement of Basis. The Redevelopment Authority of Bucks County applied for and received a \$200K grant from EPA's Brownfields Program in May 2005 and a \$1 million Brownfield loan in August 2005 that will mitigate the cost of the cleanup.

VII. PUBLIC PARTICIPATION

On September 13, 2006, EPA placed an announcement in a local newspaper, The Trend, to notify the public of the availability of this Statement of Basis, its supporting Administrative Record and the public's opportunity to request a public meeting on EPA's proposed corrective action for the Facility. If a public meeting is requested, EPA will make the necessary arrangements and will provide at least (30) calendar days prior notice.

Copies of this Statement of Basis will be mailed to persons who request a copy. In addition, the Administrative Record and this Statement of Basis is available for review during business hours at the two following locations:

- 1) U.S. Environmental Protection Agency
Region III (3WC22)
1650 Arch Street
Philadelphia, PA 19103

Phone: 215-814-3391
Contact: Andrew Clibanoff

- 2) Bucks County Free Library
3700 Hulmeville Road
Bensalem, PA 19020

Phone: 215-638-2030

EPA is requesting comments from the public on its proposed corrective action for the Former Elf Atochem North America Facility. Comments on, or questions regarding, EPA's proposal may be submitted to:

Andrew Clibanoff (3WC22)
RCRA Corrective Action Project Manager
Pennsylvania Operations Branch
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103
Phone: 215-814-3391
Fax: 215-814-3113
E-mail: Clibanoff.Andrew@epamail.epa.gov

Following the thirty (30) day public comment period ending October 13, 2006, EPA will prepare a Final Decision and Response to Comments in which it will identify the selected scope of corrective action for the Former Elf Atochem North America Facility. The Response to Comments will address all significant written comments and any significant oral comments generated at a public meeting if a meeting is held. The 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 scope of corrective action for the Facility as identified by EPA in this Statement of Basis, EPA will seek additional public comments on any proposed revised corrective measure alternative.

Date

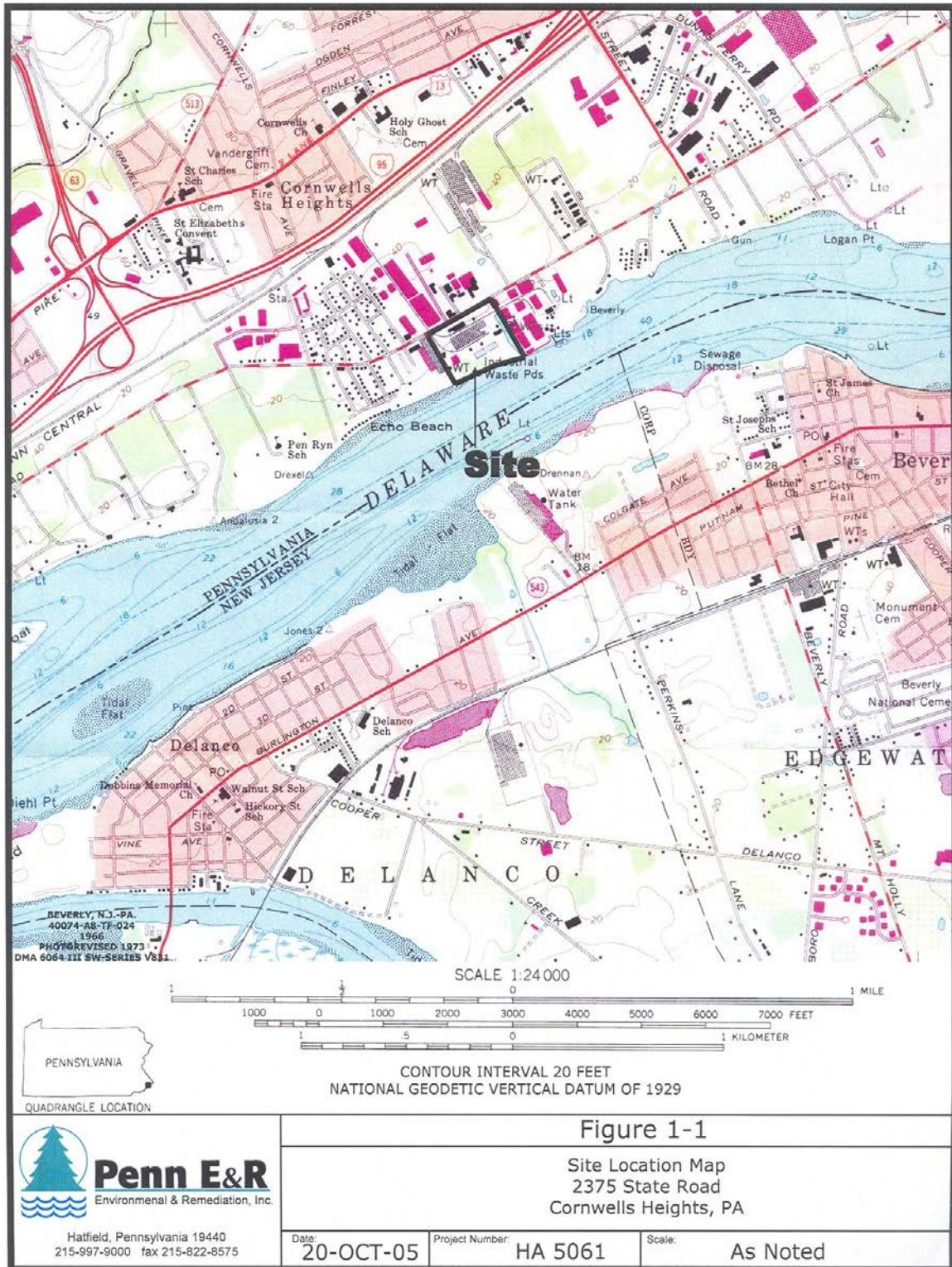
James J. Burke, Director
Waste and Chemical Management Division
USEPA Region III

VIII. REFERENCES

The following documents constitute the Administrative Record and were utilized to support the proposed remedy contained in this Statement of Basis:

1. Report of Remedial Investigation Activities, Former Retention Ponds, Elf Atochem North America, prepared by McLaren/Hart Environmental Engineering Corp., August 22, 1996.
2. Interim Report of Site Characterization Program at the Elf Atochem North America, Inc. Cornwells Heights Facility, prepared by McLaren/Hart, Inc., November 25, 1998
3. Act 2 Plus Remedial Investigation/Risk Assessment Work Plan, Former Elf Atochem North America, Inc. Facility, prepared by Environmental Resources Management, July 27, 2000.
4. Correspondence from Maureen Essenthier (EPA) to Peter Barringer (Environmental Resources Management), Comments on the July 2000 Act 2 Plus Remedial Investigation/Risk Assessment Work Plan, Former Elf Atochem North America, Inc. Facility, November 16, 2000.
5. Act 2 Plus Remedial Investigation/Risk Assessment Work Plan, Former Elf Atochem North America, Inc. Facility, prepared by Environmental Resources Management, October 1, 2001.
6. Correspondence from Peter Barringer (ERM) to Maureen Essenthier (EPA), Response to EPA's November 2000 Comments on the July 2000 Work Plan, October 8, 2001.
7. Correspondence from Andrew Clibanoff (EPA) to Peter Barringer (ERM), Comments on the October 2001 Act 2 Plus Remedial Investigation/Risk Assessment Work Plan, Former Elf Atochem North America, Inc. Facility, January 25, 2002.
8. Act 2 Plus Remedial Investigation/Site Characterization Work Plan, Former Elf Atochem North America, Inc. Facility, 2375 State Road, Cornwells Heights, Bucks County, PA, prepared by Penn E&R, February 4, 2003.
9. Memorandum from Andrew Clibanoff (EPA) to Joe Casey (BRLP), EPA Comments on Act 2 Plus Remedial Investigation/Site Characterization Work Plan, Former Elf Atochem North America, Inc. Facility, March 6, 2003.
10. Results for Atofina Phase II Environmental Site Characterization, prepared by Gilmore & Associates, Inc., March 31, 2003.

11. Act 2 Plus Remedial Investigation/Site Characterization Work Plan, Former Elf Atochem North America Facility, prepared by Penn E&R, June 16, 2003.
12. Memorandum from Andrew Clibanoff (EPA) to File, Review of the June 16, 2003 Revised Work Plan, July 17, 2003.
13. Correspondence from Andrew Clibanoff (EPA) to Joe Casey (BRLP), Approval of Revised Work Plan, August 20, 2003
14. Remedial Investigation/Risk Assessment Report for the Property Located at 2375 State Road, Cornwell Heights, Bucks County, PA, prepared by Penn E&R, May 13, 2004.
15. Final Characterization Report for the Property Located at 2375 State Road, Cornwells Heights, Bucks County, PA, prepared by Penn E&R, November 23, 2004.
16. Correspondence from Andrew Clibanoff (EPA) to Joe Casey (BRLP), Comments on Final Characterization Report, February 22, 2005.
17. Correspondence from Jeffrey Walsh, P.G. (Penn E&R) to Andrew Clibanoff (EPA), Response to EPA's Comments on the Final Characterization Report, June 7, 2005.
18. Memorandum from Jeff Walsh, P.G. (Penn E&R) to Andrew Clibanoff (EPA), Soil Management Plan for Borrow Soils Associated with the Planned Onsite Soil Exchange for the Former Retention Pond Soils, September 27, 2005.
19. Correspondence from Andrew Clibanoff (EPA) to Joe Casey (BRLP), Comments on the Soil Management Plan for Borrow Soils, October 12, 2005.
20. Remedial Action Workplan (RAWP) for the Property Located at 2375 State Road, Bensalem, Bucks County, PA, prepared by Penn E&R, October 21, 2005.
21. Correspondence from Andrew Clibanoff (EPA) to Joe Casey (BRLP), Comments on the RAWP, December 20, 2005.
22. Correspondence from Jeffrey Walsh (Penn E&R) to Andrew Clibanoff (EPA), Response to EPA's Comments on the RAWP, March 23, 2006.
23. Correspondence from Andrew Clibanoff (EPA) to Joe Casey (BRLP), RAWP Approval Letter, May 16, 2006.



Adopted from October 21, 2005 Remedial Action Workplan