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Office of
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EPA/ROD/R03-89/080
September 1989

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Superfund Record of Decision:

Ambler Asbestos Piles, PA

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Ambler Asbestos Piles site is in the southwestern portion of the Borough of Ambler, Montgomery County, Pennsylvania. This second operable unit for the site addresses the CertainTeed asbestos pile portion of the Ambler Asbestos site. The CertainTeed asbestos pile contains asbestos scrap materials and encompasses approximately 3.5 acres of a 5-acre tract. Land around the site is used for industrial, commercial, residential, and transportation purposes. The site is bordered to the southeast by the Stuart Farm Creek floodplain and associated wetlands system, and to the west by the Wissahickon Creek floodplain. The CertainTeed pile was created by the disposal of asbestos-cement scrap originating from asbestos pipe manufacturing operations at the CertainTeed plant. In addition, asbestos-contaminated sludge from a process water treatment settling pond was also disposed of at the site. Asbestos waste disposal continued from 1962 until 1977 when the State ordered the CertainTeed pile closed. At present the pile contains approximately 110,000 cubic yards of asbestos-related waste material which is covered by approximately 22,000 cubic yards of soil. Several inorganic contaminants have also been detected in the soil and debris of the pile as well as in surface water and sediment from Stuart Farm Creek. Because the actual sources of the inorganic contaminants in the creek have not been identified, a verification study will be performed to define the source of these contaminants. The primary contaminant of concern affecting the soil, sediment, debris, and surface water is asbestos. (See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision - Ambler Asbestos Piles, PA
Second Remedial Action - Final
Contaminated Media: soil, sw, sediments, debris
Key Contaminants: asbestos

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 52
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(See ANSI-Z39.18) *See Instructions on Reverse*

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EPA/ROD/R03-89/080
Ambler Asbestos Piles, PA
Second Remedial Action - Final

16. Abstract (continued)

The selected remedial action for the site includes regrading the pile plateau to promote proper storm water drainage; placing a soil cover with geotextile reinforcement on portions of the pile plateau and slope where the soil cover is less than two feet deep; performing a verification study to determine the source of inorganics in Stuart Farm Creek; installing erosion control devices to protect the toe of the pile from scouring by Stuart Farm Creek; implementing erosion and sedimentation controls to facilitate vegetation; restricting site access; monitoring air and surface water; and post-closure maintenance. The estimated present worth cost for this remedial action is $753,000, which includes annual O&M costs of $21,700 for the first 5 years and $10,200 for years 6-30.

Declaration for the Record of Decision

Site: Ambler Asbestos Piles
Borough of Ambler
Montgomery County, Pennsylvania

Statement of Basis and Purpose

This decision document represents the selected remedial action for the second operable unit at the Ambler Asbestos Site, in Ambler, Pennsylvania, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. Section 9601 et seq. and to the extent practicable the National Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is documented in the contents of the Administrative Record for this site. The Commonwealth of Pennsylvania has concurred on the remedy.

Assessment of the Site

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. Section 9606 that actual or threatened releases of hazardous substances from this site, as discussed in "Summary of Site Risks" on pages 14 - 18, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare or the environment.

Description of the Selected Remedy

This Operable Unit is the second and final of two operable units planned for the site. Both operable units address the potential release of asbestos from the site by containing the asbestos-contaminated waste piles. Operable Unit 1. addresses the Locust Street and Plant Piles on the portion

of the site owned by Nicolet, Inc. This Operable Unit addresses the Pipe Plant Dump (CertainTeed Pile) on the portion of the site owned by CertainTeed Corporation.

The major components of the selected remedy are as follows:

- The pile plateau will be regraded to promote proper drainage of stormwater.

- A soil cover with a geotextile reinforcement where necessary will be installed on portions of the plateau and side slope areas where the existing soil cover is less than two feet.

- Additional borings will be collected in the pile plateau and side slopes to determine cover thickness and define soil characteristics.

- Performance of a verification study to determine source of inorganics in Stuart Farm Creek.

- Erosion on waste pile slopes due to storm events, soil creep, freeze/thaw effects., etc. will be repaired with a geotextile liner and additional soil cover.

- Erosion control devices will be installed to protect the toe of the pile from the scouring action of Stuart Farm Creek.

- Erosion/sedimentation controls will be implemented during remedial activities to facilitate the establishment of vegetation.

- Installation/Upgrade of fencing/locking gates and posting of warning signs.

- Air monitoring for asbestos will occur during remedial activities (personnel and environmental).

- Post-closure inspections, monitoring, and maintenance of the pile, and preparation of a contingency plan will be accomplished.

Declaration

The selected remedy is protective of human health and the environment, attains Federal and State Requirements that are applicable or relevant and appropriate to this remedial action (or a waiver is justified) and is cost-effective as set forth in Section 121(d) of CERCLA, 42 U.S.C. Section 9621 and Section 300.68 of the NCP. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threat of the site was not found to be practicable, this remedy does not accomplish the statutory preference for treatment as a principal element of the remedy. It should be noted that, since asbestos cannot be combusted and is essentially chemically inert, a permanent remedy as such cannot be effectively implemented at this site. Therefore, this remedy becomes the only currently feasible remedy under CERCLA for asbestos at this site.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted bi-annually for the first five years after initiation of remedial action and yearly thereafter, and this complies with the requirements for review set forth in Section 121(c) of CERCLA, 42 U.S.C. Section 9621(c).

9/29/89
Date

Edwin B. Erickson
Regional Administrator

Table of Contents
for
Decision Summary

I. Site Name, Description and Location

The CertainTeed Pile site (a portion of the Ambler Asbestos site) is located in the southwestern portion of the Borough of Ambler, Montgomery County, Pennsylvania (Figure 1). The site is approximately five acres in size and is adjacent to the southeast corner of the Nicolet, Inc. Plant pile. The site is further bounded on the southwest by a wastewater transmission line and easement, on the southeast by Stuart Farm Creek, and on the east by railroad tracks (Figure 2). The CertainTeed Asbestos pile encompasses approximately 3.5 acres.

II. Site History and Enforcement Activities

The CertainTeed Pile site reportedly received primarily asbestos-containing solid pipe scrap from 1962 to 1974. During the years that the CertainTeed Pile was active, there were two types of manufacturing waste material disposed at this site. The first was a 5% solids sludge, which consisted of 32% calcium carbonate and 65% hydrated cement and silica, less than 2% asbestos and approximately 1% minor miscellaneous components. This sludge, which was waste material from the process water treatment settling ponds, was transported to the scrap pile via tank truck.

The second type of waste was Asbestos-Cement (A-C) scrap which originated mainly from reject pipe and pipe lathe turnings generated during the pipe finishing operation. This A-C waste consisted of a mixture of 10-20% asbestos fiber interlocked within a 80-90% calcium silicate complex matrix which was created by autoclaving the mixture under a high pressure (150 psi) saturated steam (350-370 degrees F). The resulting matrix becomes a type of synthetic rock-like structure. The pipe scrap was hauled to the scrap pile by Globe Trash Disposal Service. From time to time CertainTeed hired an outside company to bulldoze the pipe in order to crush, flatten and consolidate the waste.

The CertainTeed Pile site lies within the Delaware River drainage basin. The area is characterized by relatively flat topography with occasional rolling hills with the greatest change in relief occurring along

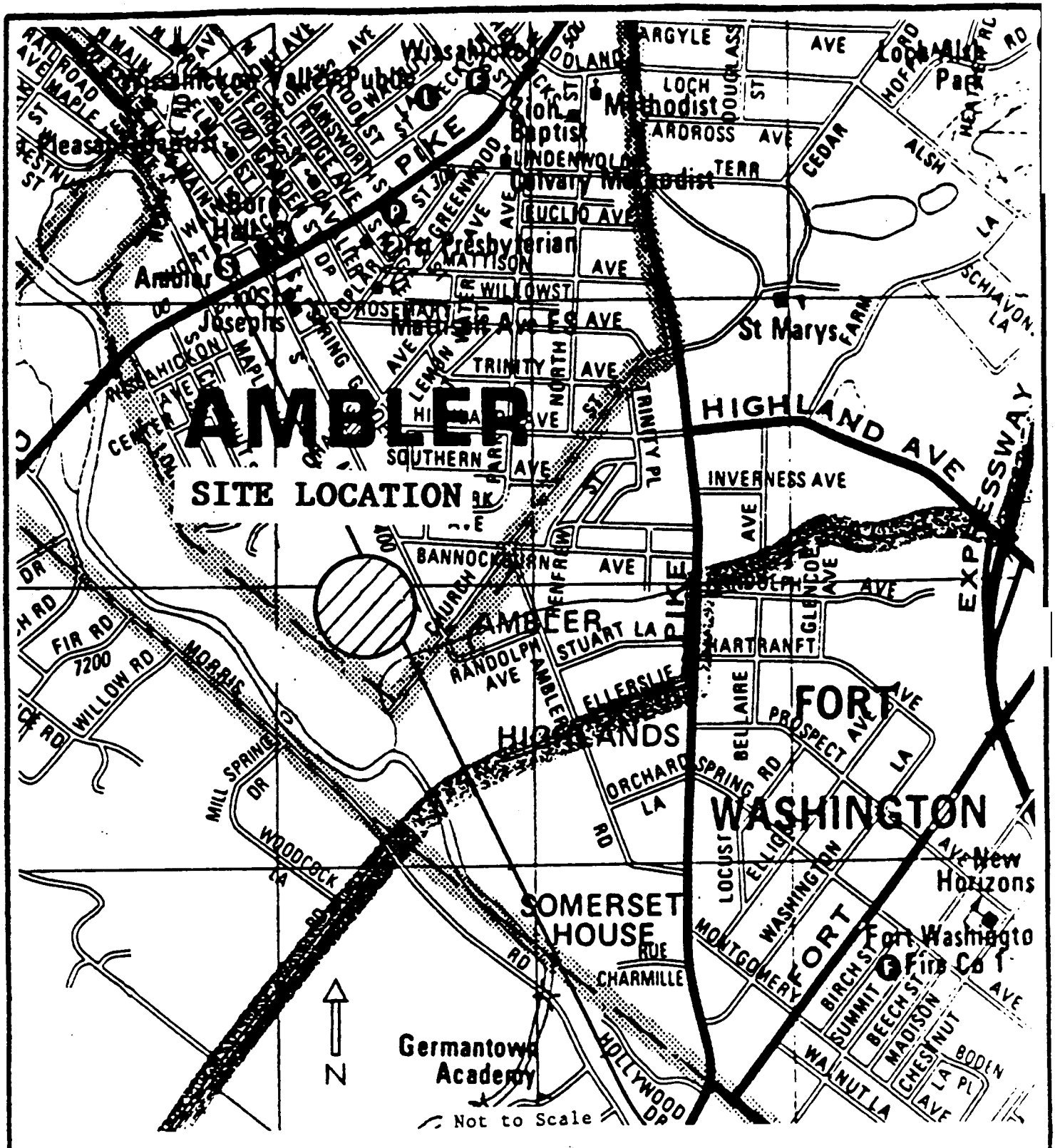

FIGURE 1

SITE LOCATION MAP

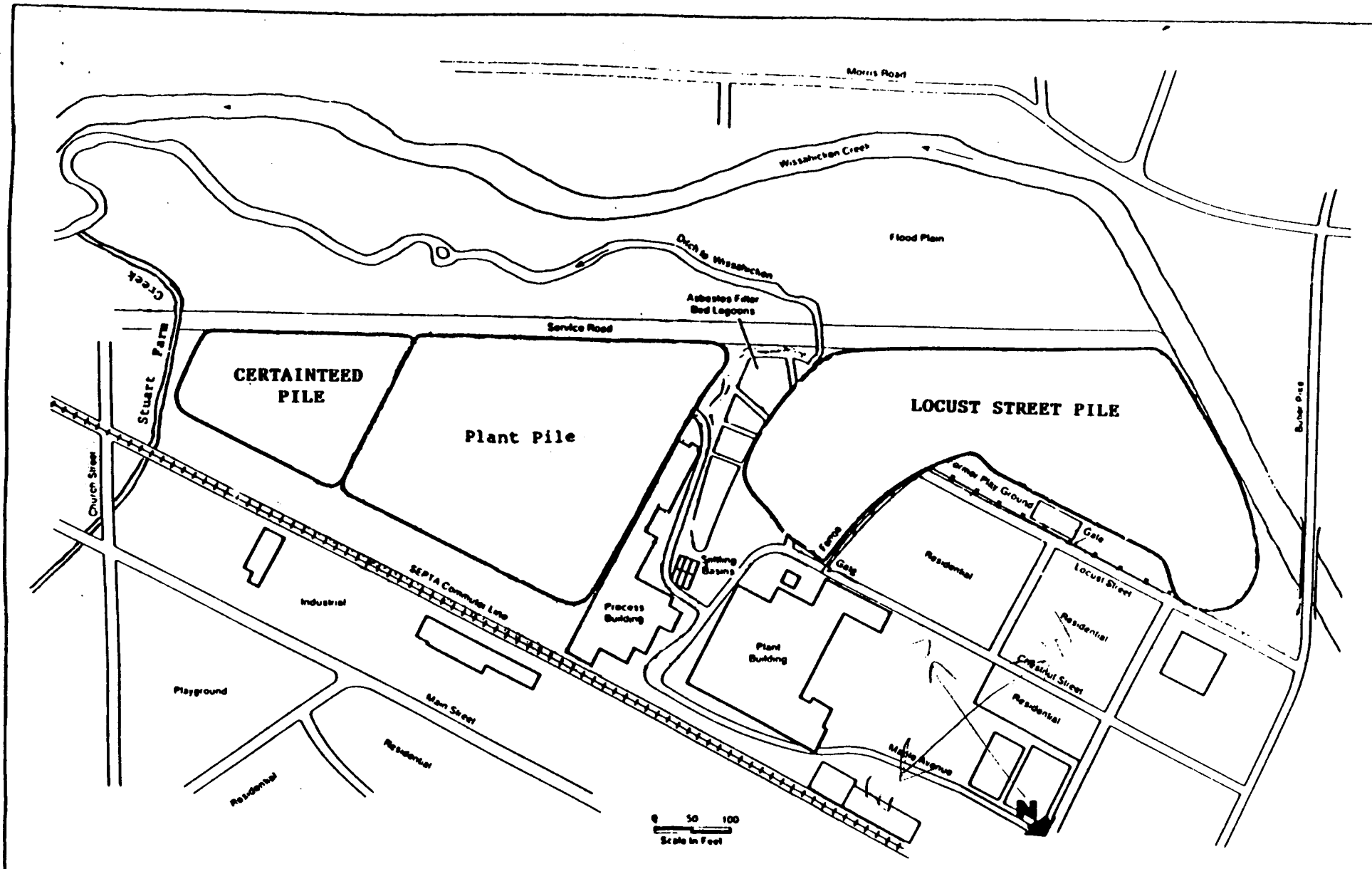

FIGURE 2

PILE LOCATION MAP

the flood plains of the many creeks and tributaries that flow through this area. Elevations within a mile of the site range from 160 to 300 feet above Mean Sea Level (MSL). The CertainTeed Pile rises approximately 45 feet above the natural grade.

The site is located adjacent to the 100 year floodplain of Stuart Farm Creek. Stuart Farm Creek flows along the southeastern side of the CertainTeed Pile. The portion of Stuart Farm Creek adjacent to the pile has an associated wetlands system. The wetlands system occupies an approximately 10 - 15 foot wide band along the Creek and joins the Wissahickon Creek flood plain approximately 300 feet downstream from the pile.

Land use around the site includes industrial, residential, commercial and transportation. The CertainTeed Pile site is located within an industrial zoned area along the southwest border of the Ambler Borough line. Residential housing and an adjoining playground are located approximately 300 feet east of the site. Numerous educational and recreational facilities are located within 1.2 miles of the site. Agricultural land is located approximately 2,000 feet to the west of the Ambler Asbestos site. The CertainTeed manufacturing area and the Southeastern Pennsylvania Transportation Authority (SEPTA) Commuter railroad are located east-northeast of the site, 100 to 200 feet away. A metal fabricating plant and a wastewater treatment facility are located approximately 200 feet to the east and southeast of the site respectively.

Starting in 1968, CertainTeed undertook an intensive program to develop the technology to recycle the waste generated during the manufacturing process. In early 1972, at the request of the Pennsylvania Department of Environmental Regulations (PADER), and as required for filing a solid waste disposal permit, a study was conducted to evaluate the impact of sludge leachate on surface and ground waters. The results of the studies found that the dumping procedures had little or no noticeable impact on surface water or groundwater.

By 1974, the recycling program progressed to a point where all of the waste sludge could be recycled back into the manufacturing process thus eliminating the need to truck it to the waste pile. The portion of the dump which was used for sludge dumping was then covered with dirt and vegetated.

During this same time period, the pipe manufacturing technique was improving and the quantity of the scrap pipe that needed to be taken to the waste pile was continually declining. Progress also continued on the recycling of autoclaved pipe scrap into the manufacturing process, and by early 1977, CertainTeed had developed the ability to reuse most of this hard waste. The dumping of pipe waste was discontinued when the CertainTeed Pile was closed in 1977 in accordance with the conditions of a "Consent Order" with PADER in consultation with EPA. The total quantity of asbestos-related waste material is approximately 110,000 cubic yards which is covered with approximately 22,000 cubic yards of soil.

After the phase out of the CertainTeed Pile, whenever the pipe scrap generated by the manufacturing process could not be totally recycled, the excess was taken to the Montgomery County landfill. This procedure continued until the manufacturing operations at the plant were discontinued on January 8, 1982.

The Ambler Asbestos Site was proposed for placement on EPA's Superfund National Priorities List in October 1984 and was ranked 523 of 703 when promulgated on the NPL on June 6, 1986.

On November 11, 1985, the CertainTeed Pile was inspected by U.S. EPA, PADER, WESTON and CertainTeed Corporation. The cover on the pile was found to be in relatively good condition and well vegetated. Evidence of minor erosion and scouring was observed along the south side of the pile by Stuart Farm Creek. The observations indicated a low potential for pile stability problems and/or cover loss over the short term. EPA and PADER decided that surface water and sediment samples of the creek and water

samples from the shallow aquifer under the floodplain area adjacent to Wissahickon Creek would be taken by the EPA FIT team to verify that no contaminants of concern were migrating from this source.

On May 12, 1986 the NUS FIT III team took five (5) water samples from Stuart Farm Creek adjacent to and southeast of the CertainTeed Pile. The samples were analyzed by Transmission Electron Microscopy (TEM). Chrysotile asbestos fibers were detected both upstream and downstream of the closed site. The average concentration of two aqueous samples both upstream and downstream was 42 MFL (million fibers per liter).

In May 1987, EPA notified CertainTeed of its potential liability for the CertainTeed Pile, and provided it with an opportunity to perform an (RI/FS) on the CertainTeed Pile. At the same time EPA was performing an RI/FS on the other two piles (the Nicolet Piles). Due to the scheduling of the EPA RI/FS it was mutually agreed that CertainTeed would collect the necessary RI data and EPA would incorporate this information into its FS. In December, 1987, CertainTeed signed a Consent Order where they agreed to collect said data.

During CertainTeed's 1988 investigation, asbestos was detected in the onsite air, the CertainTeed Pile and in Stuart Farm Creek. In addition, organic and inorganic compounds were detected in the pile and in samples from the Stuart Farm Creek both upstream and downstream of the pile. The inorganic compounds including arsenic, chromium, cadmium, lead, nickel, zinc and copper were found both in the pile and in upstream and downstream samples from the creek. Other potential sources for these contaminants exist adjacent to the Stuart Farm Creek upstream of the CertainTeed Pile. Consequently, the actual source or sources of these inorganic compounds in the creek cannot be verified at present. Therefore, a verification study will be required prior to implementation of the chosen alternative in order to better define the source of these inorganic contaminants.

III. Community Participation

In accordance with Section 113(k)(2) and 117 of CERCLA, on August 16, 1989, EPA placed a quarter page advertisement in the Ambler Gazette announcing the 30 day comment period on the Proposed Plan for the second operable unit of the Ambler Asbestos site. Also announced was the availability of the Proposed Plan and supplemental documentation in the Administrative Record and the site repository; the Ambler Branch of the Wissahickon Valley Public Library. In addition, the announcement provided the opportunity for a public meeting upon request.

The public comment period began August 18, 1989 and ended September 18, 1989. There were no requests for a public meeting and no comments to the Proposed Plan.

IV. Site Characteristics

A. Air Quality/Geology/Hydrology

1. Air Quality

The CertainTeed Pile site is located in the Metropolitan Philadelphia, Interstate Air Quality Control Region (U.S. EPA, July, 1987). This region is classified as an attainment area for all criteria pollutants except photochemical oxidants (precursors to ozone). This Air Quality Control Region is currently classified as secondary nonattainment for particulate matter (TSP), primary nonattainment for carbon monoxide (CO) and, primary nonattainment for photochemical oxidants (VOCs which are precursors to ozone). The area, however, is currently unclassifiable or better than national standards for sulfur oxide (SO_2). Locally, air quality is potentially impacted by industrial and private sources.

The following potential sources of asbestos are located in Ambler near the CertainTeed site:

- o "East and West Maple Street" Pile and berm around the Reservoir Area.
- o CertainTeed Plant Area.
- o Nicolet Plant Area.
- o Nicolet Piles and Lagoon Area.
- o Other background asbestos near the site.

2. Geology

The site study area is underlain by bedrock of the Stockton Formation of Triassic age. The Stockton Formation is described by Barksdale (1958) as consisting of light-colored, coarse-grained, arkosic sandstone and conglomerate; red to reddish arkosic units are the most characteristic of the Formation, especially the lower members of the Stockton Formation that underlie the site. Individual layers within the Stockton Formation commonly pinch out or grade into beds of different texture or mineralogy, and rarely can be traced for any significant distance. Sequences of beds, however, may persist for several miles.

The Stockton Formation crops out in an east-northeast trending band approximately five miles wide in the Ambler area. Bedding strikes northeast and dips to the northwest at 10 to 20 degrees. Bedding planes commonly show ripple marks, mud, cracks, raindrop impressions, cross bedding, and pinch and well structures. The thickness of the unit ranges from 1,000 to 5,000 feet and probably averages about 3,000 feet near the site. The Formation is extensively faulted and is cut by at least two sets of vertical joints, one parallel to strike and one at about a 50 degree angle to strike.

Weathering of the Stockton Formation generally results in deposits of sandy clay loams of variable thickness that form an undulating topography of moderately low relief. Valleys are typically eroded into the

softer sandstone beds while uplands are more commonly underlain by the arkosic beds. The depth of bedrock in the study area has been estimated to be less than 10 feet (Preliminary Assessment/Site Investigation, NUS, 1983). However, it has been reported that quarry activities may have occurred under the Locust Street Pile (Johnson and Schroder, 1977)

3. Hydrology

a. Groundwater Hydrology

Groundwater flows in the Stockton Formation through both primary intergranular openings as well as secondary joints and faults. Flow direction is locally quite variable and hydrologic boundaries are frequent. In general, regional groundwater flow is either along the strike of the formation or down dip. To a great extent, the occurrence and movement of groundwater in the Stockton Formation is controlled by the configuration of the base of the weathered zone and by vertical changes in the permeability of the deposits (Barksdale et al., 1958). In the vicinity of the waste piles, groundwater flow is expected to be toward Wissahickon Creek. Shallow flow is likely to be unconfined while deeper groundwater is under artesian or semiartesian conditions. The depth to groundwater has been reported to be less than 5 feet in this site area.

Aquifer tests in the Stockton Formation (semiartesian deeper ground water) indicate that the unit is one of the best sources of ground water in southeastern Pennsylvania. Transmissability ranges from 1,000 to 35,000 gallons per day per foot (gpd/ft) with typical values between 5,000 and 9,000 gpd/ft. The storage coefficient ranges from 0.0001 to 0.000001 indicating a range of conditions from semiartesian to true artesian. Well yields range from 1 to 900 gallons per minute (gpm) with typical values from 50 to 100 gpm. Specific capacity varies from 0.35 to 44 gpm/ft with a median value of about 6 gpm/ft (Barksdale et al., 1958; R. E. Wright Associates, Inc., 1982).

Water quality in the Stockton Formation is generally good but highly variable depending on local hydrogeologic and land use conditions: Typical values of water quality parameters are: iron, 0.10 mg/1; manganese, 0.04 mg/1; bicarbonate, 84 mg/1; nitrate, 10 mg/1; sulfate, 24 mg/1; total dissolved solids, 150 mg/1; hardness 100 mg/1; specific conductance, 250 micro-ohms/cm; and pH, 7.2 (R. E. Wright Associates, Inc., 1982). Water from the Stockton Formation is a primary source of drinking water for a number of private and public users including the Borough of Ambler.

Water supply for the site area is provided by the Ambler Borough Water Department through a series of nine supply wells. During the period from July through December 1983, individual supply wells pumped between 60 and 730 gallons per minute for a weekly total of between 1,500 and 2,400 gallons per minute. The municipal well nearest to the site is approximately 0.4 miles east of the CertainTeed Pile. This well is 500 feet deep, and pumps roughly 100 gpm (NUS, 1983). The nearest known private (residential drinking water) well is the Burke well.

Groundwater is not expected to be a significant migration pathway for asbestos at this site. This is due to two factors; 1) the site's location in a hydrologic discharge zone where generally base flow is slightly upward and toward the stream; and 2) the relative insignificant subsurface downward or lateral migration of asbestos fibers in soil. To date, there is no documentation of groundwater transport of asbestos particles (Dalton, U.S. EPA, 1985).

b. Surface Water Hydrology

There are two bodies of water in the vicinity of the site: Stuart Farm Creek and Wissahickon Creek. As described previously, Stuart Farm Creek is a small feeder stream which flows in a south-southwest direction to the Wissahickon. Neither of these creeks are used as a source of drinking water.

The Wissahickon Creek runs along the west side of the Nicolet property, and is approximately 300 feet from CertainTeed's site. The creek flows southeast at a gradient of approximately 22 feet per mile and contributes to the Schuylkill River. A public water supply is located on the Schuylkill approximately 12 miles downstream from the site.

Surface drainage from the CertainTeed Pile is unrestricted at present, with the majority of runoff flowing towards either Stuart Farm Creek or the floodplain for the Wissahickon Creek.

The flood plain of Wissahickon Creek is a groundwater discharge zone and several permanent and seasonal springs have been reported in the area. No specific data exists on the water quality or the rates of discharge of the springs.

B. Extent of Contamination

1. Contamination Problem

The main contaminant of concern is asbestos. The source of contamination associated with this operable unit is the CertainTeed Asbestos Pile. The routes of asbestos exposure are inhalation via ambient air and ingestion which may result from the ingestion of soil or surface water containing asbestos. Dermal contact is not an exposure route of concern since asbestos is not likely to be absorbed through the skin.

Sampling events on and near the CertainTeed Pile site have demonstrated that asbestos fibers may have migrated offsite from the pile into the surrounding ambient air and adjacent surface water. At present, the pile's plateau and slopes are covered with a layer of topsoil up to twenty feet thick. However, broken pieces of asbestos-cement pipe are noticeable on some areas of the pile, possibly due to slope erosion. In addition, trees and other large vegetation have taken root along the slopes of the pile. If this vegetation should be uprooted, a release of asbestos to the ambient air could result.

In addition, organic and inorganic compounds were detected in the pile and in samples from the Stuart Farm Creek both upstream and downstream of the pile. The inorganic compounds including arsenic, chromium, cadmium, lead, nickel, zinc and copper were found both in the pile and in upstream and downstream samples from the creek. Other potential sources for these contaminants exist adjacent to the Stuart Farm Creek upstream of the CertainTeed Pile. Consequently, the actual source or sources of these inorganic compounds in the creek cannot be verified at present. Therefore, a verification study will be required prior to implementation of the chosen alternative in order to better define the source of these inorganic contaminants.

2. Field Investigation and Analytical Program

The field investigation and analytical program was designed to determine if potential public health risks and environmental impacts still exist at the CertainTeed Pile site and if remedial action is needed in accordance with 40 C.F.R. Section 300.68 of the NCP.

a. Investigation Results

On August 10, 1987, EPA required that a focused Environmental Investigation (EI) be conducted at the CertainTeed Pile. In response to this requirement, CertainTeed engaged the firm AGES, of Valley Forge, Pennsylvania to conduct the focused EI.

The scope of the AGES EI included surface water, sediment and test pit sampling and analysis (see Figure 3); construction of borings and piezometers in the waste pile; cover soil sampling and analysis; OSHA mandated personnel air sampling; and preparation of a report summarizing the results of the field and analytical program. The inorganic sample results are presented in Tables 1, 2 and 3.

A summary of the results from the field investigation conducted by AGES is presented below:

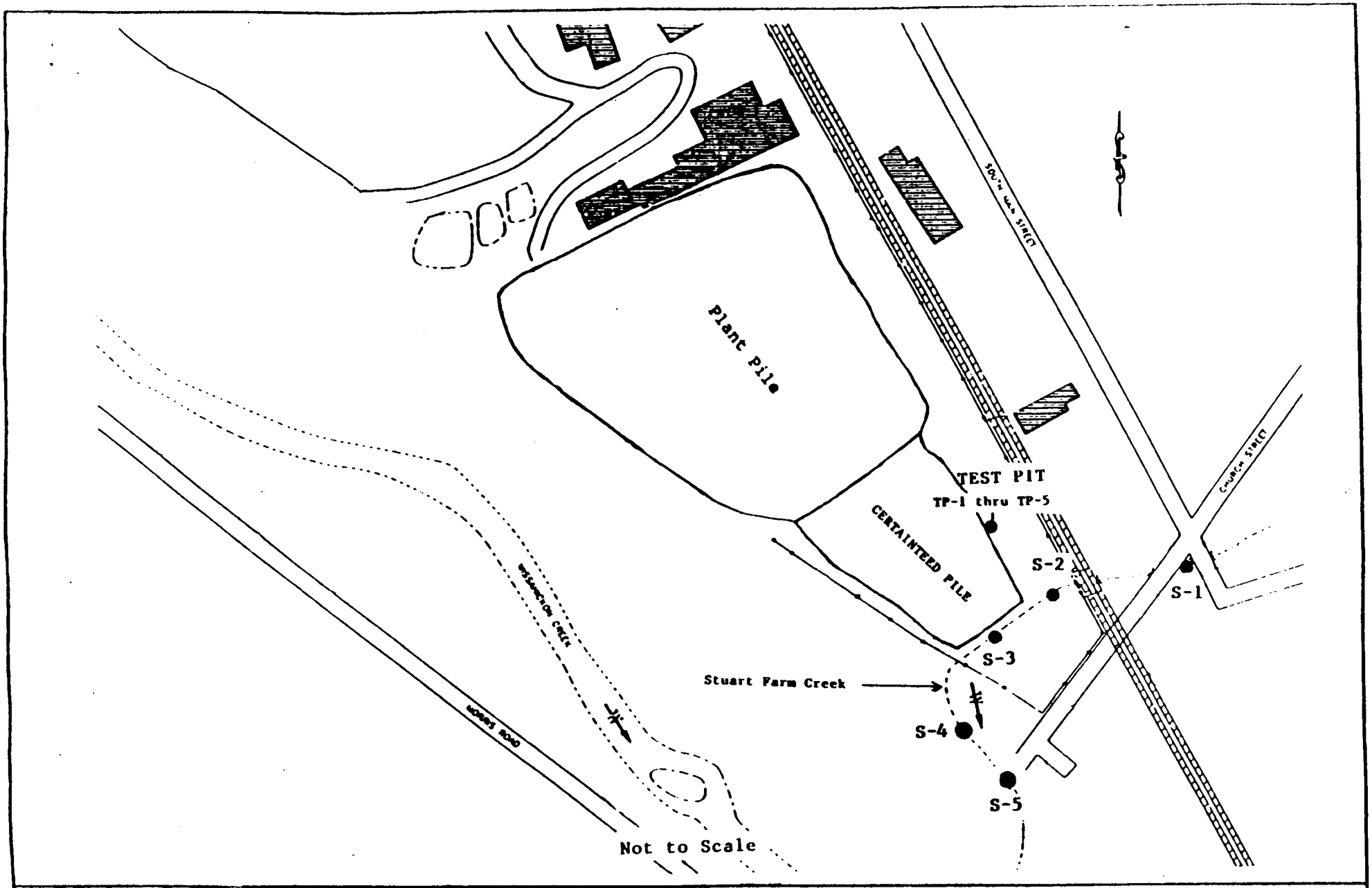

FIGURE 3

SAMPLE LOCATION MAP

TABLE 1
INORGANIC DATA SUMMARY TABLE
FOR SEDIMENT SAMPLES OF
STUART FARM CREEK

SAMPLE LOCATION	S-1	S-2	S-3	S-4	S-4 Duplicate	S-5
DATE COLLECTED	8/2/88	7/25/88	7/25/88	7/25/88	7/25/88	8/2/88
CONCENTRATION UNIT	ppm	ppm	ppm	ppm	ppm	ppm
ASBESTOS*	2-3	4-6	ND	2-3	3-5	3-5
ARSENIC	5.1	ND	7.1	ND	ND	9.3
CADMIUM	1.0	1.1(B)	ND	.79(B)	ND	2.3
CHROMIUM	7.4	ND	14.4	36.4	19.5	24.7
COPPER	10.8	41.1	12.0	82.1	15.9	21.9
LEAD	50.0	64.7	6.0	ND	17.7	36.6
NICKEL	5.8(B)	20.6	13.0	21.0	17.5	18.6
ZINC	167	289	37.6	201	148	146

NOTES: * Concentration given in total percentage by volume.

ND = Not detected.

B = Analyte was found in blank as well as in sample.

TABLE 2
INORGANIC DATA SUMMARY TABLE
FOR SURFACE WATER SAMPLES OF
STUART FARM CREEK

SAMPLE LOCATION	S-1	S-2	S-3	S-4	S-4 Duplicate	S-5	BLANK	BLANK
DATE COLLECTED	8/2/88	7/25/88	7/25/88	7/25/88	7/25/88	7/25/88	7/25/88	8/2/88
CONCENTRATION UNIT	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
ASBESTOS*	ND	ND	ND	.0421	ND	.0421		
ARSENIC	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM	8.6	ND	ND	ND	ND	ND	ND	5.3
CHROMIUM	19.2	ND	17.7	ND	ND	7.3(B)	ND	ND
COPPER	47.3	ND	112	10.4(B)	ND	39.0	ND	27.2
LEAD	21.9	29.5	12.8	23.0	7.7	ND	ND	48.6
NICKEL	17.8(B)	ND	76.5	ND	ND	49.0	ND	13 (B)
ZINC	130	61.8	3630	85	174	51.1	ND	80

NOTES: * Concentration given in million fibers per liter (MFL).

ND = Not detected.

B = Analyte was found in blank as well as in sample.

TABLE 3
DATA SUMMARY TABLE FOR
TEST PIT SAMPLES OF
THE CERTAINTEED PILE

SAMPLE LOCATION	TP-1	TP-2	TP-3	TP-4	TP-5	OBSERVED
DATE COLLECTED	8/4/88	8/4/88	8/4/88	8/4/88	8/4/88	RANGE [1]
CONCENTRATION UNIT	ppm	ppm	ppm	ppm	ppm	(ppm)
ASBESTOS*	3	11	2	4	.2	———
ARSENIC	13.3	49.9	42.7	1770	43.0	0.1-73
CADMIUM	ND	1.4	ND	ND	.72(B)	———
CHROMIUM	215	83.6	108	88.1	61.1	1-1000
COPPER	29.2	27.0	75.4	24.9	27.3	1-700
LEAD	18.7	31.2	53.1	43.7	37.5	<10-300
NICKEL	535	137	174	168	89.4	<5-700
ZINC	80.7	99.4	102	94.2	82.8	<5-2900
EP TOXICITY						
ARSENIC	.17		.19			
BARIUM	.05		.09			

NOTES: * Concentration given in percentage by weight.
ND = Not detected.
B = Analyte was found in blank as well as in sample.
[1] = Shacklette (1984); Element concentrations in soils, Conterminous United States. These concentrations represent ranges within the Eastern U.S.

- Concentrations of copper (112 ppb), zinc (3,630 ppb), and nickel (76.5 ppb), detected in a surface water sample taken from Stuart Farm Creek adjacent to the CertainTeed Pile (S-3), were all above upstream concentrations (47 ppb, 130 ppb, and "not detectable", respectively).

- The upstream and downstream sediment samples exhibited heavy metal concentrations of similar magnitude.

- A test pit sample yielded a high concentration of arsenic (1,770 ppm). The remaining levels of heavy metals within the test pit were within the observed range for soils in the eastern U.S. No background soil samples were analyzed during this investigation. Two samples exhibiting elevated heavy metal concentrations were analyzed using the Extraction Procedure (EP) Toxicity test. The results were below the regulatory limits defining a waste as hazardous under RCRA, listed in 40 CFR 261.24.

- Asbestos was detected using the transmission electron microscopy (TEM) in the two downstream surface water samples (S-4 and S-5), at a concentration of .0421 MFL. A duplicate sample was collected at location S-4. Asbestos was not detected in the duplicate. Asbestos was also not detected in the upstream samples. (The detection limit for this analytical procedure was .0421 MFL.)

- Asbestos was detected using the polarized light microscopy (PLM) analytical procedure in both upstream and downstream sediment samples at concentrations ranging from 2 to 6 percent by volume.

- Asbestos was detected using TEM, in all of the test pit samples at concentrations ranging from 0.2 to 11 percent by weight.

- Exposed areas of the pile were identified on the northern most portion of the western side slope and along the toe of the southern side slope. Portions of the pile and side slopes have experienced extensive tree growth.

- o A portion of the southeast slope of the CertainTeed Pile is located within the floodplain of Stuart Farm Creek.

- o Cover soil on both the piles slopes and plateau consist primarily of a silty or clayey sand.

- o No perched or shallow groundwater was detected in any of the three piezometers installed in the pile.

- o The cover soil on the plateau portion of the pile ranges in thickness from 1 to 20 feet. The angle of the side slopes averages 40% (2.5 H: 1.0 V).

b. Conclusions from the Investigation

The analysis for asbestos fibers in ambient air during the test pit and test boring investigations indicate that any gross disturbance of the in-place materials will likely cause a significant degradation of the ambient air quality. In addition, these conclusions are presented:

- o The potential of onsite sources of heavy metals and the consequent risk to the environment should be further investigated.

- o Surface water samples suggest that the CertainTeed Pile is a potential source of asbestos.

- o The location of the pile within the floodplain of Stuart Farm Creek poses a potential risk of increased releases of asbestos into area surface waters if flood conditions occur.

- o Asbestos detected in both upstream and downstream sediment samples indicate both offsite and onsite sources.

- o Potential asbestos inhalation exposures also exist if a person or persons are playing on or near exposed areas and asbestos containing material is disturbed.

- o The potential of inhalation exposure of asbestos does exist if exposed areas of the pile are disturbed resulting in entrainment of asbestos.

- o Extensive tree growth along the south slope has hindered the establishment of low lying vegetation, which is necessary in controlling erosion along the slopes.

- o Historical photos indicate that surface water ponding is occurring on the plateau area of the pile. Excessive infiltration of rainwater into the pile must be controlled via stormwater drainage and collection methods.

C. Statement of Findings Regarding Wetlands

Based on a Wetland Delineation, EPA has determined that wetlands occur adjacent to this site along Stuart Farm Creek and within the Wissahickon Creek flood plain.

The Stuart Farm Creek Wetlands occupy an approximately 10-15 foot wide band along Stuart Farm Creek at the southern foot of the CertainTeed Pile. Dominant vegetation is forested and includes sycamore, box elder and willow. Soils are the Hydric Bowmansville silt loam and the hydrology is provided by both surface runoff and a high groundwater table. This wetland system joins the Wissahickon Creek flood plain, a large wooded flood plain with inclusions of jurisdictional wetlands along the stream courses.

During site investigations, levels of inorganic contaminants were detected in Stuart Farm Creek above Federal Ambient Water Quality Criteria (Quality Criteria for Water 1986; 51 Fed. Reg. 43665; U.S. EPA, 1986). These contaminants may pose a potential threat to the environment. Other potential sources of these contaminants exist adjacent to the Stuart Farm

Creek upstream of the site. Consequently, a verification study will be performed prior to implementation of the selected remedy to determine the source of stream contamination. Depending on the results of this study, further remedial activity associated with the Stuart Farm Creek may be required.

Regardless of the results of the verification study, the selected remedy to contain the asbestos waste pile will also serve to contain any inorganic contaminants within the pile. Since the pile is located within the flood plain of Stuart Farm Creek, erosion control devices will be installed upland of the existing wetland to protect the toe of the pile. This action will serve to minimize potential harm and adverse effects to the wetlands in accordance with Executive Order 11990 (Protection of Wetlands) found at 40 C.F.R. Part 6 Appendix A.

V. Summary of Site Risks

The Endangerment Assessment (EA) addresses the potential human health and environmental impacts associated with the CertainTeed Pile site under the no-action alternative, that is, in the absence of remedial corrective action.

The results of sampling performed during the investigations, in soil, surface water, sediment, and air were reviewed to identify chemicals to be evaluated in this EA. Chemicals were selected for detailed evaluation if they were present in environmental media at concentrations above background concentrations and/or could be related to past disposal practices at the site.

The contaminant of concern at the CertainTeed Pile is asbestos; in particular, the potential for asbestos to be released to the ambient air. Asbestos is a recognized human carcinogen, causing lung cancer and mesothelioma, a form of neoplasm of the lining of the thoracic and abdominal cavities, in workers exposed by inhalation. The association between asbestos exposure by inhalation and lung cancer was first reported in 1935.

There is also evidence that oral exposure of humans to asbestos may be associated with an increased incidence of cancer of the gastrointestinal tract. Exposures have been through drinking contaminated water, either from contact with asbestos deposits or transmission through asbestos-containing cement water mains. The evidence is considered equivocal at this time.

Long-term exposure to asbestos fibers and contaminated dust also causes asbestosis, a progressive and irreversible lung disease characterized by diffuse interstitial fibrosis. Symptoms include shortness of breath, cough rales, clubbing of the fingers, and weight loss. Pulmonary changes occur more rapidly in more severely exposed individuals.

Groundwater is not expected to be a significant migration pathway for asbestos at this site. This is due to two factors; 1) the site's location in a hydrologic discharge zone where generally base flow is slightly upward and toward the stream; and 2) the relative insignificant subsurface downward or lateral migration of asbestos fibers in soil. To date, there is no documentation of groundwater transport of asbestos particles (Dalton, U.S. EPA, 1985).

The surface water pathway for asbestos exposure is also of little concern since neither the Stuart Farm or Wissahickon Creeks are sources of drinking water. In addition, existing studies and evidence regarding the toxicity potential of asbestos to aquatic life is limited.

Other reported contamination in the pile is of little or no consequence because of low reported levels or because of their presence in deep areas of the pile. In addition, the inorganic contaminants detected in the pile are not likely to be mobile based on the reported results of the EP toxicity test and the expected high pH of the waste material. Some of the inorganic concentrations detected in surface water and sediments of the Stuart Farm Creek are above Ambient Water Quality Criteria and therefore are of potential concern to aquatic life. However, pending the

results of the source verification study, these contaminants cannot be definitely attributed to the site, and therefore were not evaluated further for the purpose of this EA.

A. Exposure Assessment

1. Routes of Exposure

There are two general routes through which individuals may be exposed to contaminants at the CertainTeed Pile: inhalation and ingestion. Dermal contact and subsequent absorption of asbestos is not an exposure route of concern since asbestos is not likely to be absorbed through the skin.

For the inhalation pathway, individuals may breathe asbestos fibers which are present in ambient air and asbestos fibers which are present due to specific activities which stir up fibers. Although fenced, the site is accessible to trespassers (e.g., children riding bikes, playing on piles etc.). Activity on site may entrain asbestos fibers into the ambient air.

Trees which have grown on the pile's slopes and plateau may overturn potentially exposing asbestos contaminated soil to the environment. The proliferation of trees onsite has also served to reduce lowlying vegetation (grass, weeds, etc.). Without this vegetation, potential for soil erosion is increased and contaminated soil may become exposed. In addition, several areas of the pile have pieces of piping and other asbestos-related material exposed to the ambient air. Entrainment of asbestos fibers may occur via wind or physical disturbance of these exposed areas.

Ingestion exposure may occur as a result of ingestion of soil containing asbestos. Indirect ingestion of asbestos which has been inhaled is another form of ingestion exposure. Individuals may directly contact and inadvertently ingest contaminants present in soil on the pile which may adhere to hands, toys, tools, etc.

2. Potential Receptors

There are a number of potential receptors within the vicinity of the site. The nearest residence is approximately 300 feet east of the CertainTeed Pile. In addition, an estimated 6,000 people live within a half-mile of the site.

Finally, the metal fabricating and wastewater treatment facilities are located to the east and southeast of the site, while the Central Business District of Ambler is located approximately one-half mile north of the site.

B. Focused Risk Assessment

The primary hazard associated with the CertainTeed Pile is the potential for contact with asbestos contaminated media.

Risks from the pathways of inhalation and ingestion were characterized by first comparing concentrations of chemicals in the sampled environmental media to Applicable or Relevant and Appropriate Requirements (ARARs) identified for the site. For asbestos, based on the comparison to the chemical-specific ARARs listed in Section IX, it was concluded that under present conditions the criteria related to air quality is not currently being exceeded. In the future, however, increased erosion and weathering of the piles could increase the potential exceeding the regulatory limits. In addition, these limits would likely be exceeded if the site were disturbed by vehicular activities. Such activities would most likely occur as part of a remedial action involving excavation and removal of the soil from the site. These activities could elevate concentrations of asbestos within local surface waters.

It was concluded that potential releases of asbestos to ambient air from the CertainTeed site may occur due to the existence of exposed areas containing asbestos. It was further concluded that potential human health risks to nearby residents may be associated with releases of asbestos from such exposed areas at the site into ambient air.

Potential asbestos inhalation exposures during specific types of activities that can stir up asbestos fibers, such as children playing in soil on the pile, were also qualitatively evaluated. Under present site use conditions, activities that could stir up asbestos fibers include playing and biking on the pile by children or other trespassers. It was concluded that these and other activities could continue to occur in the absence of site remediation (i.e., under the no-action alternative). Among subpopulations who may repeatedly engage in these types of activities, cumulative asbestos exposures of concern to human health could potentially result. Given the above, the site thus presents an imminent and substantial endangerment to public health as set forth in Section 106 of CERCLA, 42 U.S.C. Section 9606.

VI. Remedial Action Objectives

Remedial action objectives consist of medium-specific or operable unit-specific goals for protecting human health and the environment. Remedial action objectives aimed at protecting human health and the environment should specify:

- The contaminant(s) of concern
- Exposure route(s) and receptor(s)
- An acceptable contaminant level or range of levels for each exposures route (i.e., a preliminary remediation goal)

The overall objective of the remedial action program for the CertainTeed Pile is to remediate the sources and/or pathways for migration of asbestos, which were identified through the AGES EI report, and the EI review. This action is required so that potential present and future exposures will be within acceptable limits and, that site related ARARs are met. In addition, the development of remedial action objectives for the CertainTeed Pile should be consistent with those objectives outlined for operable unit number one.

The specific remedial action objectives that have been developed for this site are as follows:

- Effectively restrict access to unauthorized persons. These persons would consist primarily of trespassers, mostly children who have frequently accessed the site, based on historical reports. This objective would no longer be relevant, however, should a complete removal action be implemented.

- Effectively remove, stabilize, or contain the asbestos contaminated media onsite so that potential direct contact/incidental ingestion exposures to onsite receptors are minimized, and potential releases of asbestos to ambient air and potential releases of asbestos to adjacent surface waters are not prevalent in concentrations which would create unacceptable risks to on and offsite receptors.

VII. Description of Alternatives

This section summarizes the candidate remedial action alternatives. These alternatives have been developed based on the following considerations:

- Those technologies outlined, defined as applicable to the CertainTeed Pile site.

- Technologies that are complementary or interrelated were combined into alternatives. For example, one remedial alternative - excavation/offsite disposal combines the technologies of complete removal, surface water management/erosion controls and offsite disposal.

- The alternatives were developed to address the remedial action objectives established for the site. However, not all of the alternatives developed and evaluated will equally satisfy the objectives or be as effective in addressing part or all of the site issues and contaminant pathways.

- The alternative development process should cover a range of remediation levels. These categories include:

  1) No action: A no action alternative may include minimal actions such as installation of fences/gates and monitoring activities.

  2) Treatment alternatives ranging from one that would eliminate or minimize, to the extent feasible, the need for long-term management (including monitoring) at a site, to one that would use treatment as a primary component of an alternative to address the principal threats at the site.

  3) Alternatives which involve containment of waste with little or no treatment, but provides protection of human health and the environment by preventing potential exposure and/or by reducing mobility.

With respect to the CertainTeed Pile, the remedial action technologies that remained after screening were generally under the source control classification, since onsite controls are the most appropriate to this site.

A. Alternative 1: No Action with Security Improvements and Monitoring

The purpose of evaluating the no action alternative is to provide a basis for comparison of existing site conditions with the other proposed remedial action alternatives. This alternative consists of performing no physical remediation work to the pile. Security improvements consisting of new fencing, access/egress gates (with locks), and appropriate warning and informational signs are included in this alternative. These improvements would be designed to meet the current EPA, NESHAPS, and PADER regulations regarding closed solid waste (asbestos-containing) landfills.

In addition, visual inspections and environmental ambient air monitoring would be performed during the following five years after implementation in order to evaluate whether this action alone adequately protects human health and the environment.

No other improvements or remedial measures would be undertaken under this alternative.

Capital costs associated with this alternative include fencing to complete site enclosure, installation of gates and locks, and warning signs on the fences. The total capital cost for Alternative 1 is estimated at $23,000.

Operating and Maintenance (O&M) costs are estimated at $21,000/year. These costs are incurred during long-term monitoring for asbestos and maintenance of the facility.

Assuming an annual interest rate of 10%, the present worth costs for this alternative over a 30-year period is approximately $222,000.

B. Alternative 2: Excavation/Removal - Offsite Disposal

This alternative consists of complete excavation and removal of the CertainTeed Pile waste materials to an offsite permitted/approved landfill.

The major components of this alternative include:

- Complete excavation of the waste materials, Level C activity for approximately an estimated 50 percent of the time, special precautions adjacent to Stuart Farm Creek to address surface water runoff.

- Diversion of runon and construction of runoff containment/ treatment facilities during excavation.

- Continuous air and surface water monitoring.

- o Transport equipment decontamination prior to site egress.

- o Soil testing for verification of cleanup criteria.

- o Hauling of clean soil fill to site and filling/regrading the site for positive drainage.

- o Revegetation and establishment of stormwater management controls.

It is estimated that the pile contains approximately 110,000 cubic yards of asbestos related waste materials, and is covered by approximately 22,000 cubic yards of vegetated soils.

A detailed remedial design with soil stability analyses would need to be prepared in order to perform this alternative safely due to the potentially unstable physical conditions of the interior of the pile. In addition, prior to and during construction, extensive health and safety protocols would need to be developed and implemented to minimize migration of asbestos-contaminated wastes into the air and surface water following excavation into the pile. Also, it would have to be determined where these wastes would and/or could be taken for relandfilling due to the quantity involved.

The capital cost for Alternative 2 is estimated at $27,980,000. Operating and maintenance (O&M) costs are estimated at $38,300 per year during remedial activities (approximately 2 years) and $10,400 per year following remediation. Post-remediation costs involve monitoring activities to verify effective cleanup (e.g., water and soil analysis, site maintenance).

Assuming an annual interest rate of 10% and a post-remediation timeframe of 30 years, the present worth cost of this alternative would be approximately $28,145,000.

C. Alternative 3: Onsite Vitrification via Processing Plant

This alternative would involve further pilot-scale development and analysis, and potential future construction of a full-scale vitrification plant onsite.

Vitrification is a process wherein asbestos-contaminated materials can be transformed by melting (at extremely high temperatures (1,300°F)) into a nontoxic glass-like material. This process differs from the technology referred to typically as "in situ vitrification", which melts the contaminated material in-place using high charges of electricity transfers to the material through probes driven into the contaminated material. Consequently, this process requires excavation of the asbestos-contaminated material, transferring the material to the treatment facility, and feeding the material into the furnace structure.

In simplified form, the major components and sequence of construction for this alternative are as follows:

- Research, test, analyze, and further develop the potential vitrification technology on a bench-scale, to a greater degree with site-specific materials leading toward possible approval of certain pilot- and full-scale systems to "treat" onsite the waste materials at this site (treatability studies).

- Construct a full-scale onsite facility. Many significant feasibility variables such as location and space requirements; electric and other utility services; financial and liability agreements; environmental emissions and discharge limitations; health and safety protocols; etc., would need to be worked out prior to start of construction. Electric power consumption requirements for the vitrification plant, based on reported data (supplied by vendors), would be very large (estimated at 1,000 kw per 1 ton of asbestos waste processed). A new electric

substation would likely need to be constructed on or near the site, or substantial revisions to existing facilities and major service lines run to the site.

- Excavate, haul, and stockpile waste materials from the pile in a sequenced manner (over a number of years) in order to provide the feed material to the plant. Site preparation (runon diversion, runoff control, haul roads, etc.) similar to those previously described under Alternative 2 - Excavation and Removal, would need to be employed first. Substantial soil excavation and health and safety concerns (releases of contaminants to ambient air or surface water) would need to be addressed first, as previously discussed.

- A "set-aside area" would have to be constructed to deal with large and/or foreign materials that could not be fed into the plant. These materials would likely require landfilling either on or offsite.

- Extensive environmental and personnel monitoring for workers and offsite receptors would be required in order to quantify potential releases and the impacts on the local ambient air. Even with required wetting and other dust/fiber suppression controls, unacceptable releases may occur as a result of excavation and process activities may require the construction of an enclosed work area. Even with this type of system, exhaust and emissions are imminent.

- The process would most likely require substantial modifications and/or additions as the project continued in order to deal with new data and the waste materials types/consistencies encountered during excavation.

- Assuming that the estimated 132,000 cubic yards could be processed and/or segregated (and portions landfilled), it is not currently known what could/would be done with the final product.

There may be certain potential useful purposes for the final product materials (i.e., roadbase materials, structural fill, landfill intermediate cover, etc.), however, no current reuses of these materials on a large-scale have been documented; not to mention post-reuse monitoring/evaluation of final product properties. With the current information available, it appears very likely that the great majority of these end-product materials would have to be landfilled, either back onsite in the form of a "new pile" or transported offsite to an approved location for filling.

- At the completion of processing operations the plant would need to be dismantled and removed unless a continued use for it could be found.

- The site would be backfilled and regraded for positive drainage, and revegetated. If materials are redeposited onsite, the material would be covered with a soil cover of a two-foot thickness. The cover would be vegetated and graded for positive drainage. It is not known at this time what volume reductions of waste materials could be expected using the vitrification process. Space constraints and slope requirements may limit onsite redisposal.

The preliminary capital cost of Alternative 3: Onsite Vitrification, is estimated at $17,257,000. Operation and maintenance (O&M) costs are estimated as follows: $5,948,000 per year during remedial activity, and $21,000 per year the 30 years following remediation. It is assumed that, using the vitrification treatment process, it will take approximately 7 years to complete remediation of the site. Some costs estimated for this alternative are speculative due to the technical uncertainties that are associated with some of the components of the alternative. The total present worth cost of this alternative, assuming a 10% interest rate, is $46,412,000.

D. Alternative 4: Onsite Closure

Alternative 4 involves placement of a cover system on the CertainTeed Pile. The major components of this alternative involve the following:

- Removal of large vegetation, installation of stormwater/sediment control devices, and regrading plateau, where necessary, to assure proper drainage and cover thickness (a minimum of two feet of clean, compacted fill).

- Repair of any erosion or exposed areas on waste pile side slopes with a geotextile liner and low erosion/low permeability soil cover. Soil cover on slopes should also achieve a minimum two foot thickness of clean, compacted fill.

- Installation of erosion control devices for protection of the southeast slope from the potential scouring action of Stuart Farm Creek.

- Revegetating site, where required, and installing erosion/ sedimentation controls during remedial activities until vegetation establishes.

- Performance of a verification study to determine source of inorganics in Stuart Farm Creek.

- Air and surface water monitoring for asbestos during remedial activities (personnel and environmental).

- Post-closure inspections, maintenance of the pile, and preparation of a contingency plan.

- Restricting future land use to surficial activities by authorized personnel.

Initial remedial action performed during the 1970's involved the placing of clean fill across the plateau and slopes of the pile. Borings of the plateau and slopes have indicated an existing cover thickness ranging from two to twenty feet. Since this time, substantial vegetation

growth (e.g., trees, bushes, grasses, etc.) has been established across the entire site. Therefore, initial preparation of the site would involve removing trees and large shrubs to pile level and regrading the plateau and slopes, where necessary, to assure proper drainage and a consistent cover of compacted soil. Geotextile material would be placed over exposed areas of the plateau and slope, followed by a layer of low-permeability topsoil and vegetated cover.

In addition, erosion control devices will be installed on the bottom part of the slope adjacent to Stuart Farm Creek to control against potential erosion or scouring of the pile.

Security at the site would be increased with improvements to the existing fencing onsite and installation of additional fencing to assure the site is completely fenced in. Locking gates would also be provided for access to authorized persons in the future. Warning signs would be posted on the fence, related to asbestos hazards onsite.

Inspections of the site would occur biannually for the first five years after remediation. A written report that details the effectiveness of remediation would be submitted at the end of every five years (as required by Section 121(c) of CERCLA, 42 U.S.C. Section 9621). Annual inspections of the site will be required after the first five years to ensure that human health and the environment are being adequately protected. If the potential for asbestos release is noted during inspection, air monitoring will be performed to elevate ambient asbestos levels in air. Long-term cap maintenance such as local erosion repair, grading, seeding, etc., is required to promote cap integrity over the long-term.

During onsite activities, erosion and sedimentation controls such as channels, silt fences, and jute-netting would be used as needed. Finally, a contingency plan would be developed to ensure that appropriate remedial action will be taken if local failure of the new cap were to occur.

The capital cost of Alternative 4 is estimated at $579,000. Operating and maintenance (O&M) costs, including post-treatment monitoring and maintenance, are estimated to be $21,700 per year during the first five years and $10,200 per year following that. Assuming a 10% interest rate and post-remediation monitoring time of 30 years, the present worth cost of the alternative is estimated to be $753,000. Since the asbestos is left essentially in place in a secure environment, costs have been allocated for air and surface water monitoring activities for a period of five years after initial remedial actions. Long-term visual inspections and maintenance would serve to ensure cap integrity and to detect any asbestos migration from the contained areas.

VIII. Comparative Analysis of Alternatives

This section summarizes the comparative analysis of alternatives performed in the FFS. As outlined in the EPA RI/FS Guidance Manual - Interim Final (October, 1988) nine evaluation criteria have been developed to address CERCLA requirements and technical and policy considerations which have proven to be important for selecting a remedial alternative (see also the NCP at 40 CFR Section 300.68 (h)). The nine criteria are summarized below:

- o Compliance with ARARs
- o Overall protection of human health and the environment
- o Short-term effectiveness
- o Long-term effectiveness and permanence
- o Reduction of toxicity, mobility or volume
- o Implementability
- o Cost
- o State acceptance
- o Community acceptance

Each alternative is evaluated below with respect to these nine criteria.

No Action Alternative

Although this alternative would be easily implemented at minimal capital and O&M costs, it has serious shortcomings. A No Action alternative would not comply with the CERCLA Section 121 objective to reduce volume, mobility, or toxicity of the waste. In addition, this alternative does not meet the remedial action objectives for the site which require the alternative to minimize the potential for direct contact or incidental ingestion of asbestos from the site. Therefore, the criterion addressing the overall protection of human health and the environment would not be met. In addition, employing a no-action alternative will provide neither short or long-term effectiveness since neither the source or the pathways of risk would be reduced or eliminated. Finally, this alternative will not meet any ARARs in the long term. As a result, it is anticipated that both state and community acceptance of this alternative would be unfavorable.

Excavation/Removal with Offsite Disposal

The alternative of excavating and removing the waste to an offsite disposal source would provide excellent results with respect to the criterion of long-term effectiveness. In addition, over the long-term, the criteria of reduction of toxicity, mobility, or volume and protection of human health/environment would also be satisfied since the source of the asbestos would be permanently removed. However, these two criteria would not be met with respect to short-term effectiveness, since the potential for release of asbestos to the ambient air and surface water would be quite high during the excavation and removal period (estimated to last 10 months). As a result, on a short-term basis, compliance with all chemical and location-specific ARARs would not be satisfied (except for the PADER requirement for a flood plain and stream encroachment permit). Finally, the implementation and cost of this alternative would be excessive (8 hrs/day - 5 days/week for 18 months at a total project cost of nearly $23,000,000).

Onsite Vitrification

The results of the evaluation of this alternative are similar to those presented for the excavation/removal alternatives. The reduction of toxicity/mobility or volume and protection of human/environmental health would be satisfied on a long-term basis. However, these two criteria on a short-term basis would not be met. The same concerns noted above are also present with respect to short-term compliance of the ARARs criteria.

Finally, the implementation and total cost of this alternative are very unfavorable with the project lasting approximately 7 years (including treatability, and pilot studies, and site closeout) and costing approximately $46,000,000.

Onsite Closure

Onsite closure via capping with a low permeability cover and vegetation employs a proven technology which can be readily implemented. Although it would not reduce the volume of material onsite, capping the site would significantly reduce the potential for asbestos and inorganic material to be released to the ambient air and surface water by containing the pile within a semi-permeable cover. The short-term effectiveness of this alternative would be very favorable since remedial activity would be performed with limited disturbance to the waste material. Long-term effectiveness would also be met via a maintenance and monitoring program. All Federal chemical specific ARARS are expected to be met even on the short-term since no intrusive work would occur during capping construction. State ARARs involving landfill cover requirements would also be addressed. Finally, the time-frame of implementation and project costs are very favorable (approximately 11-13 months and $750,000 respectively).

IX. The Selected Remedy

Section 121 of CERCLA establishes cleanup standards for the site remediation and articulates a preference for remedial actions in which treatment permanently and significantly reduces the volume, toxicity, or mobility of site contaminants. The provision notes that offsite transport and disposal of hazardous substances without such treatment is least favored where practicable treatment technologies are available. The statute mandates selection of a remedial action "that is protective of human health and the environment, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery techniques to the maximum extent practicable."

EPA has reviewed and considered these statutory provisions and the regulations contained in the National Contingency Plan, 40 CFR Section 300, in light of the conditions present at the CertainTeed Site and concludes that Alternative 4 - Onsite Closure is the most consistent with these requirements. This remediation alternative offers the best combination of effectiveness, implementability, and cost efficiency and involves the use of what can be considered the most feasible remedy under CERCLA for asbestos. This alternative meets all Federal ARARS and all but one State-related ARAR (slope requirement) for which a waiver is appropriate under Section 121(d)(4) of CERCLA, 42 U.S.C. Section 9621(d)(4). In addition, the proposed cover design is consistent with other EPA and state agency designs that have been proposed and/or approved.

The majority of the site is presently covered with clean fill up to twenty feet in some areas. In addition, substantial vegetation is present across the entire site. Therefore, for those areas of the pile which exhibit acceptable cover depth, vegetation and drainage patterns no further work will be required to have them conform to the selected remedial action.

Because this remedy will result in hazardous substances remaining onsite, five year reviews, as specified by CERCLA Section 121(c), 42 U.S.C. Section 9621(c), would be required for the remedy, despite the full containment of contamination. As discussed earlier, inspections will be

conducted bi-annually for the first five years after initiation of remedial action and yearly thereafter.

X. Statutory Determinations

EPA's primary responsibility at Superfund site is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, section 121 of CERCLA establishes several other statutory requirements and preferences. These include compliance with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws unless a statutory waiver is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

A. Protection of Human Health and the Environment

The selected remedy will contain the asbestos contamination at the site, which will ensure adequate protection of human health and the environment. This action can be expected to result in significant long-term reduction of potential public health risks and environmental impacts resulting from the direct contact and migration of asbestos fibers via sediment, surface water, and air transport mechanisms, while minimizing short-term risks to onsite workers and the environment that are likely with other alternatives.

B. Cost-Effectiveness

The selected remedy is the most cost-effective alternative that can provide adequate short and long-term protection of human health and the environment.

C. Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy of onsite closure will effectively attain all applicable or relevant and appropriate requirements (ARARs) except the action-specific State ARAR noted below.

A summary of the existing asbestos regulatory limits or goals is presented in C.1. below. Most of the regulatory effort to date has been focused on occupational exposures in industrial and educational settings. The development of guidelines for the general population has moved less rapidly due to the complexity of sampling, analyzing and interpreting asbestos concentrations in ambient air. The existing regulations and occupational health studies can however be used as a guideline in evaluating the quality of ambient air and water at the Ambler site.

The RCRA regulation for cap design is not an applicable requirement for this site, because asbestos is not a hazardous waste. EPA has further determined that RCRA cap design requirements are not relevant or appropriate requirements for this site, for reasons set forth below.

A multi-layered cap generally conforms to the RCRA technology guidelines found under 40 CFR Section 264, which recommend a three-layered system consisting of an upper vegetative layer over a low permeability layer. The cap functions by diverting infiltrating liquids from the vegetative layer through the drainage layer and away from the underlying waste materials. The primary function of a RCRA cap is to control infiltration and leachate from the waste material that may contaminate underlying groundwater. A multilayered cap is typically used for hazardous waste site closures, which this site is not (based on the data collected).

Accordingly, the design of the cap need not be in accordance with RCRA regulations to be protective. The purpose of a multi-layered cap on an asbestos site is to prevent re-emergence of the waste on the surface of the site through the processes of wind and water erosion, freeze/thaw

cycles, site use, etc. In addition, it is desirable to maintain some moisture content in the fibrous material to control airborne releases of asbestos in the event of localized re-exposure. Therefore, it is protective to use innovative cap designs at this site consisting of semi-permeable materials.

1. Chemical/Contaminant-Specific ARARs

REGULATION	LIMIT/STANDARD
40 CFR 61.153 (Clean Air Act)	Specifies standards for inactive asbestos waste disposal sites.
40 CFR 763 (Toxic Substances Control Act)	
Subpart G	2 fibers per cubic centimeter (f/cc) by phase contrast microscopy (PCM) (8-hr time weighted average) for asbestos abatement worker exposure.
Subpart E	0.02 f/cc by TEM performance standard for the remediation in schools.
29 CFR 1910.120 or 54 FR 9294 (Occupational Health and Safety Act)	Health and safety standards for employees engaged in hazardous waste operations.
29 CFR 1910 and 29 CFR 1926 (Occupational Health and Safety Act)	0.2 f/cc by PCM (8-h time weighted average) for industrial and construction worker exposure.

2. Action-Specific ARARs

a. A Discharge Permit from the Pennsylvania Department of Environmental Resources (PADER) Division of Water Quality Management must be applied for and the expected pollutant levels identified if the potential exists for asbestos to be present in any discharge to surface water.

b. The Montgomery County Conservation District requires that a soil erosion control plan be written and implemented for construction activities. This plan must be available for review onsite.

c. Asbestos is a solid waste as defined under Pennsylvania's Management Act, of July 7, 1980, Act No. 1980-97, 35 P.S. Section 691.1 et seq.. Disposal of asbestos and asbestos containing waste at an unpermitted facility in Pennsylvania is unlawful. Permitted facilities must comply with the Department's rules and regulations governing solid waste management facilities. The Commonwealth consistently requires that asbestos and asbestos containing wastes be disposed at permitted solid waste management facilities subject to the above Act and the Department's rules and regulations governing solid waste management facilities.

Relevant and appropriate requirements related to slope design, vegetative cover, and surface water control are found in 25 PA Section 273. However, the requirement of a 1-foot clay cap and drainage layer found under 25 PA 273.234 is not an appropriate and relevant requirement. The use of a low permeability clay cap is not appropriate for the same reasons that a RCRA cap is not appropriate for the CertainTeed Pile site. Semipermeable cover material provides more effective protection from potential airborne releases of asbestos by maintaining some moisture content in the waste material.

25 PA 273.234 requires that the final slopes of a landfill cover may not exceed a grade of 33 percent. The angle of the side slopes of the CertainTeed Pile average 40 percent grade. Alternative 4 does not provide for modification of the slopes, therefore, this ARAR will not be attained.

Section 121(d)(4) of CERCLA, 42 U.S.C. Section 9621 (d)(4), identifies several circumstances under which certain ARARs may be waived. Two of the permissible circumstances are listed below with an explanation of how they apply to the selected remedy.

- Compliance with this ARAR will result in a greater risk to human health and the environment than alternative options (See Section 121(d)(4)(B). In order to achieve a side slope that does not exceed a 33 percent grade for the waste pile, extensive regrading would be required if the toes of the pile were to remain in their present position. This would mean cutting into the asbestos waste and exposing the asbestos contaminants below. Such action would pose a serious risk to human health and the environment because asbestos fibers would likely become airborne from the disruption.

- Compliance with this ARAR is technically impracticable from an engineering perspective (See Section 121(d)(4)(C). Construction would be a major concern. The angle of the side slopes could be lessened to close to 33 percent by holding the top of the slope constant and placing a soil wedge (thereby expanding the "footprint" of the piles at the bottom of the slopes). However, this could not be performed without encroaching on existing structures, including Stuart Farm Creek, the Sewer Authority collection system, and potentially the railway tracks.

3. Location-Specific ARARs

The location-specific ARARs for the CertainTeed Pile basically involve consideration of the Stuart Farm Creek flood plain and accompanying wetlands. As shown in Figure 2, the southeastern slope of the CertainTeed Pile abuts Stuart Farm Creek.

- Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands) found at 40 CFR Part 6, Appendix A require that actions be taken to avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values of wetlands and floodplains.

- A Flood Plain/Stream Encroachment Permit is required by the PADER Bureau of Dams and Waterways for construction or alteration of permanent fill/structures along or in the channel or floodway of any stream. This regulation may be applicable to the installation of erosion control systems along the southeast slope of the pile.

D. Utilization of Permanent Solutions and Alternative Technologies to the Maximum Extent Practicable

The selected alternative is currently the most appropriate solution for this operable unit and represents the maximum extent to which permanent solutions and treatment can be practicably utilized.

Of the alternatives that are protective of human health and the environment, the selected remedy is the easiest to implement within the shortest time-frame, is most cost-effective and provides the highest level of short-term effectiveness.

Excavation/offsite disposal and onsite vitrification provide a higher degree of reduction in toxicity, mobility, or volume and long-term effectiveness and permanence. However, the short-term risks for these alternatives are unacceptable since the potential for release of asbestos would be quite high during the lengthy intrusive activity required for each of the alternatives.

E. Preference for Treatment as a Principal Element

The selected remedy does not accomplish the statutory preference for treatment as a principle element of the remedy. Since asbestos cannot be combusted and is chemically inert, a permanent remedy as such cannot be effectively implemented at this site.

XI. Documentation of Significant Changes

The proposed plan for the CertainTeed Pile site was released for public comment on August 18, 1989. The selected remedy, Alternative 4 - Onsite Closure, was identified in the Proposed Plan as the preferred alternative. No written or verbal comments to the Proposed Plan were submitted to EPA during the comment period. Therefore, no significant changes to the remedy preferred in the Proposed Plan were necessary.

APPENDIX A

RESPONSIVENESS SUMMARY FOR THE AMBLER ASBESTOS PILES SITE (SECOND OPERABLE UNIT) AMBLER, PENNSYLVANIA

In accordance with Section 113(k)(2) and 117 of CERCLA, the U.S. Environmental Protection Agency (EPA) established a 30 day comment period from August 18, 1989 through September 18, 1989 on the Proposed Plan and other site related documents for the Ambler Asbestos Pile (CertainTeed Pile) in Ambler, Pennsylvania.

An advertisement was placed in the Ambler Gazette on August 16, 1989 announcing the availability of the Proposed Plan and the dates of the 30 day comment period. The advertisement also announced that requests were being accepted for a public meeting.

EPA contacted Ambler Borough officials before the advertisement was published.

During the 30 day comment period EPA received no written or verbal comments from the public. In the past, residents were highly interested in the Locust Street pile (first operable unit) and interest remains high. However, the lack of comments for this operable unit may be due to the fact that the Locust Street Pile is visible to the public eye, and the CertainTeed Pile is not visible from the residential area.

APPENDIX B

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
Post Office Box 2063
Harrisburg, Pennsylvania 17120

Deputy Secretary for
Environmental Protection

717-787-5028

September 29, 1989

Mr. Edwin B. Erickson
Regional Administrator
USEPA Region III
841 Chestnut Building
Philadelphia, PA 19107

Re: Ambler Asbestos Superfund Site
Operable Unit 2, CertainTeed Pile
draft Record Of Decision (ROD)

Dear Mr. Erickson:

The draft Record of Decision (as received September 18, 1989) for the Ambler Asbestos, Operable Unit 2, has been reviewed by the Department. It is my understanding that this Record of Decision will be submitted to you for your approval.

The proposed remedy for the Operable Unit 2, CertainTeed Pile, would include regrading the plateau, repairing erosion damage, installing erosion control devices, and post closure monitoring.

I hereby concur with the EPA's proposed remedy, with the following conditions:

* EPA will assure that the Department is provided an opportunity to fully participate in any negotiations with responsible parties.

* The Department will be given the opportunity to concur with decisions related to the design of the remedial action, to assure compliance with DER design specific ARARs.

* The Department's position is that its design standards are ARARs pursuant to SARA Section 121, and we will reserve our right to enforce those design standards.

* The Department will reserve our right and responsibility to take independent enforcement actions pursuant to state and federal law.

* This concurrence with the selected remedial action is not intended to provide any assurances pursuant to SARA Section 104(c)(3).

If you have any questions regarding this matter please do not hesitate to contact me.

Sincerely,

Mark M. McClellan
Deputy Secretary