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Environmental Protection
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Office of
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September 1990

EPA

Superfund Record of Decision:

Myers Property, NJ

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 7-acre Myers Property site is a former pesticide and industrial chemical manufacturing facility in Franklin Township, Hunterdon County, New Jersey. The site lies adjacent to, and in the 100-year floodplain of the Cakepoulin Creek which flows to the north of the site. The site is comprised of adjourning private lands, two acres of wetlands, and five acres of residential property with onsite residents. The estimated 250 people who reside within one mile of the site use the underlying sole-source aquifer as their drinking water supply. From 1928 to 1959, the site was used intermittently by several companies to manufacture pesticides and industrial chemicals. Improper handling by facility owners and operators of hazardous substances including components used to manufacture DDT and its by-products (e.g., PCBs), and asbestos, has resulted in onsite contamination. In 1978, State investigations identified 20 unlabeled drums of chemicals containing metals, DDT, other organic chemicals in a shed, and 24 cubic yards of asbestos material in an onsite warehouse. In addition, surface soil and debris were found to be contaminated with high levels of DDT, other organics, and metals. In 1985, EPA performed the first of two removal actions at the site, which

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Myers Property, NJ
First Remedial Action
Contaminated Media: soil, sediment, debris, gw
Key Contaminants: VOCs (benzene), other organics (PCBs, PAHs, pesticides, dioxin), (arsenic, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 103
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

included repackaging the deteriorating drums, solid DDT, lead compounds, asbestos, soil, and debris into fifty-five gallon drums followed by offsite disposal at a hazardous waste landfill. In 1987, the second EPA removal action was performed, which included implementing site access restrictions by installing a security fence. This Record of Decision (ROD) addresses the first of two operable units, and includes remediation of the soil, sediment, buildings, and shallow ground water aquifer. This ROD also addresses interim remedial activities for the second operable unit, the ground water in the bedrock aquifer, which will be fully addressed in a future ROD. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs including benzene; other organics including PCBs, PAHs, dioxin, and pesticides such as DDT; and metals including arsenic, and lead.

The selected remedial action for this site includes excavating 48,700 cubic yards of organic- and inorganic-contaminated soil and sediment; treating the soil/sediment using chemical dechlorination to remove organics followed by soil washing to remove dechlorination process reagents, soluble reaction by-products, and metals; onsite backfilling of treated soil; restoring designated wetlands, if affected by the remedy; shallow and deep ground water pumping and treatment using ion exchange and granular activated carbon, followed by reinjection to the aquifer, or offsite discharge to Cakepoulin Creek; conducting an additional study of deep bedrock ground water to determine the need for subsequent remedial actions; performing ground water and other appropriate environmental monitoring; and decontaminating onsite buildings with disposal of contaminated debris offsite. A contingency to this remedial action is the provision of point-of-use treatment of residential wells should drinking water supplies become contaminated. The total present worth cost for this remedial action is $45,918,000 which includes a total O&M cost of $3,053,00 for years 0-5 and $441,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for soil and sediment are based on State Soil Action levels and include total DDT 10 mg/kg, total VOCs 1 mg/kg, total carcinogenic and noncarcinogenic PAHs 10 mg/kg, arsenic 20 mg/kg, cadmium 3 mg/kg, copper 170 mg/kg, and lead 250-1,000 mg/kg. Chemical-specific ground water cleanup goals for discharge are based on Federal and State MCLs and State Ground Water Quality Criteria (GWQC) and include benzene 1 ug/l (State MCL), DDT 0.001 (State GWQC), arsenic 50 ug/l (Federal and State MCL), and lead 50 mg/l (Federal and State MCL).

ROD FACT SHEET

SITE	
Name:	Myers Property
Location/State:	Franklin Township, New Jersey
EPA Region:	USEPA Region II
HRS Score (date):	33.83; 09/01/83
NPL Rank:	91
ROD	
Date signed:	09/28/90
Remedy/ies:	Excavation and on-site chemical dechlorination treatment of contaminated soil, extraction and treatment of contaminated groundwater, and decontamination of on-site buildings.
Capital Cost:	$30,587,000
O & M/Year:	$3,053,000 (5 years) $ 441,000 (30 years)
Present Worth:	$45,918,000
LEAD	
Remedial/Enforcement:	Remedial
Primary Contact (phone):	John Prince, Project Manager, USEPA, (212) 264-1213
Secondary Contact (Phone):	Robert McKnight, Chief NNJRAS, USEPA, (212) 264-7509
WASTE	
Type (metals, PCB, &c):	Chlorinated pesticides, volatile and semivolatile organic compounds, polycyclic aromatic compounds, dioxins and dibenzofurans, and inorganic compounds.
Medium (soil, g.w., &c):	Soil, groundwater, and buildings.
Origin:	Manufacturing.
Est. Quantity cu. yd.:	75,000 cu. yards soil

DECLARATION STATEMENT

RECORD OF DECISION

Myers Property

SITE NAME AND LOCATION

Myers Property
Franklin Township, Hunterdon County, New Jersey

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Myers Property site, in Franklin Township, New Jersey, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the administrative record for the site.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, 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

The remedy described in this document represents the first planned remedial action for the site. It addresses contaminated soil, contaminated buildings, and contaminated ground water in the shallow aquifer underlying the site, and is the final remedial action for these media. In addition, the remedy includes an interim remedial action to mitigate contamination in the deeper bedrock aquifer. The feasibility of complete remediation of the bedrock ground water cannot be fully assessed at this time. A final remedy determination for the bedrock ground water will be made after a review of the effectiveness of the interim remedial action.

The major components of the selected remedy are as follows:

- Excavation of soils and sediments contaminated with organic and inorganic compounds exceeding action levels above the water table, on-site chemical dechlorination treatment of the organic-contaminated soil coupled with soil washing to remove inorganic contaminants, and on-site backfilling of the treated soils;

- Restoration of designated wetland areas subsequent to backfilling of the treated soils;

- Extraction of shallow ground water contaminated above health-based drinking water standards, on-site treatment, and reinfiltration into the ground water or discharge into Cakepoulin Creek;

- Extraction and on-site treatment of bedrock ground water contaminated above health-based drinking water standards in the areas of highest contamination, and reinfiltration into the ground water or discharge into Cakepoulin Creek, coupled with additional study to evaluate a long-term response for the contaminated bedrock ground water;

- Ground water monitoring to identify the threat to potable wells in the area and provision of point-of-use treatment for these wells should they become contaminated by the site;

- Decontamination of on-site buildings; and

- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

Declaration of Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining on the site above health-based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

9/28/90
Date

Constantine Sidamon-Eristoff
Regional Administrator

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUDITH A. YASKIN, COMMISSIONER
CN 402
TRENTON, N.J. 08625-0402
(609) 292-2885
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SEP 27 1990

Mr. Constantine Sidamon-Eristoff
Administrator, USEPA - Region II
Jacob K. Javits Federal Building
New York, NY 10278

Dear Mr. Eristoff:

The Department of Environmental Protection has evaluated and concurs with the selected remedy for the Myers Property Superfund Site outlined below:

> The remedy described in this document represents the first planned remedial activity for the site. It addresses contaminated soil, contaminated buildings, and contaminated groundwater in the shallow water-bearing zone underlying the site, and is the final remedial activity for these media. In addition, the remedy includes an interim remedial action to mitigate contamination in the deeper bedrock water-bearing zone. The feasibility of complete remediation of the bedrock groundwater cannot be fully assessed at this time. Therefore, a review of this remedy component will be required to make a final remedy determination.
>
> The major components of the selected remedy are as follows:
>
> - Excavation of soils and sediments contaminated with organic and inorganic compounds exceeding action levels above the water table, on-site chemical dechlorination treatment of the organic-contaminated soil coupled with soil washing to remove inorganic contaminants, and on-site placement of the treated soils;
> - Restoration of designated wetland areas subsequent to backfilling of the treated soils;
> - Extraction of shallow groundwater contaminated above health-based drinking water standards, on-site treatment, and reinfiltration into the groundwater or discharge into Cakepoulin Creek;

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- Extraction and on-site treatment of bedrock groundwater contaminated above health-based drinking water standards in the areas of highest contamination, and reinfiltration into the groundwater or discharge into Cakepoulin Creek, coupled with additional study to evaluate a long-term response for contaminated groundwater;

- Groundwater monitoring to identify the threat to potable wells and provision of an alternate water supply for the on-site and surrounding residential wells should the wells become contaminated by the site;

- Decontamination of on-site buildings; and

- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

However, the Department cannot concur with the Agency's determination of ARARs of discharges to the waters of the State. The Agency must recognize that the procedures employed by the Department to establish clean-up levels are based on the Department's regulations. The Department reserves the right to formally challenge the agency's determination of the ARARs.

The Department reserves its final comments on the complete Record of Decision pending an opportunity to review the completed documents, including the documents responsiveness summary.

Very truly yours,

Judith A. Yaskin

Judith A. Yaskin
Commissioner

DECISION SUMMARY

RECORD OF DECISION

MYERS PROPERTY

SITE DESCRIPTION

The Myers Property site is located on Lower Kingtown Road in Franklin Township, Hunterdon County, New Jersey, and about three miles south of Clinton, New Jersey. The site lies adjacent to Cakepoulin (or Capoolong) Creek to the north. The Capoolong Creek Trail, part of the Capoolong Creek Wildlife Management Area, runs through the site along a former railroad bed (See Figures 1 and 2).

The site includes: approximately five acres presently owned by Mr. and Mrs. Cornelius O. Myers, Jr.; part of adjoining privately owned properties; and approximately two acres of an undeveloped area south of Lower Kingtown Road owned by the State of New Jersey and designated as a wetland.

The site is presently used as a residence by the Myers family. Adjacent properties are either undeveloped, or used for residential or agricultural purposes. Five buildings are present on the site: the Myers' residence; a cinderblock warehouse; a former water-powered mill of wood and stone construction (the cornerstone is dated 1827); and two small wooden buildings.

Cakepoulin Creek is an FW-2 trout production stream stocked by the New Jersey Department of Fish and Game. The Creek and the adjacent New Jersey-owned wetlands are all part of the Capoolong Creek Wildlife Management Area, and the Creek has been classified Category I: a stream with high water quality in a sensitive environmental area, afforded special protection under the State's environmental laws. The majority of the site lies within the 100-year floodplain of Cakepoulin Creek, and a portion of the site lies within a closed-canopy, hardwood wetland.

Ground water in the area is classified as Class II-A, a current source of drinking water. Ground water in the area is also classified as a Sole Source Aquifer, because it is the only viable source of drinking water for the local community. An estimated 250 people live within a one-mile radius of the site. While land use in the Hunterdon County area has been predominantly agricultural, the construction of Interstate Highway 78 about four miles north of the site has opened the region to increased residential development.

No underground tanks have been found at the site, and no buried drums are known to exist. (A number of fifty-five gallon drums generated during the remedial investigation [RI] are presently stored in the warehouse. The drums could not be removed after the field investigation due to potential dioxin contamination, but will be addressed with the material being remediated under this Record of Decision [ROD].)

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Portions of the site were used as a pesticide manufacturing facility during the 1940s. Three companies are known to have been involved in pesticide handling or manufacturing while owning and operating on the property: W.A. Allen Company, Elko Chemical Works, and the Pennsylvania Salt Manufacturing Company. The first two companies no longer exist. The Pennsylvania Salt Manufacturing Company became Pennwalt Corporation, and is now Atochem North America, Inc.

The W.A. Allen Company owned the site from 1928 to 1932, and may have operated on the site, formulating fertilizer-pesticide mixtures for residential use. Elko Chemical Works operated a pesticide production plant at the site from 1942 to 1945, manufacturing the insecticide p,p'dichlorodiphenyltrichloroethane, commonly called DDT. The Pennsylvania Salt Manufacturing Company bought the property in 1945 and operated the plant, producing DDT, for two years. In 1947, Pennsylvania Salt Manufacturing Company sold the property to Associated Terminal, Inc., a New Jersey Corporation.

Associated Terminal leased the site from 1953 to 1959 to the Clinton Chemical Company, which produced anhydrous aluminum chloride on the site. Little additional information is available regarding other on-site activities of Associated Terminal. Mr. and Mrs. Myers, the current owners, purchased the property in 1971, and have since utilized it as a residence.

EPA believes that the contamination at the site is the result of careless handling of hazardous substances by former owners and operators of industrial facilities at the site. The following is a description of hazardous substances known to have been handled on the site.

- DDT was manufactured on site, packaged, and shipped off site, possibly by rail-car.
- Monochlorobenzene, oleum, sulfuric acid, and chlorine gas were brought to the site and used in the production of DDT.
- Waste sulfuric and hydrochloric acids were generated in the manufacture of DDT.
- Benzene was brought to the site and used in an experimental process to produce monochlorobenzene for use in the production of DDT - polychlorinated benzenes are by-products of this process.

- Asbestos found on the site was allegedly used as insulation around an on-site boiler.

In 1979, Franklin Township officials notified the New Jersey Department of Environmental Protection (NJDEP) of the presence of hazardous materials at the Myers Property. Initially, a shed located on the site contained approximately 20 unlabeled containers of chemicals, and the warehouse contained about 24 cubic yards of asbestos material. NJDEP collected samples at the site and identified the presence of metals, DDT, and other organic chemicals in the drums; sheets of asbestos in the warehouse; and piles of wood and metal contaminated with DDT and a variety of other hazardous substances. Surface soil samples collected near the barn indicated high levels of DDT.

The site was proposed for inclusion on the National Priorities List (NPL) in December 1982, which qualified the site for funding and response under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The site was finalized on the NPL on September 1, 1983. In 1984, NJDEP requested that the U.S. Environmental Protection Agency (EPA) take the lead for remedial activities at the site. EPA performed a removal action in August 1984 to address the presence of badly deteriorated drums containing DDT and other materials. Deteriorated drums, solid DDT and other organic chemicals, lead compounds, sheets of asbestos, soil, and building debris were repacked into a total of 216 fifty-five gallon drums and removed to a hazardous waste landfill. In October 1987, a second removal action was performed to install a security fence around the perimeter of the most highly contaminated parts of the site.

In December 1982, NJDEP notified Mr. Myers of his potential liability under Section f of New Jersey's Spill Compensation and Control Act. He was directed to initiate remedial measures on his property.

In 1985, EPA identified the Pennwalt Corporation as a potentially responsible party (PRP) as a result of its activities on the site, and Mr. Myers as a PRP through his ownership of the site. On August 1, 1985, EPA notified Pennwalt and Mr. Myers of their potential liability and offered them the opportunity to undertake a remedial investigation and feasibility study (RI/FS). Mr. Myers responded that he did not consider himself liable for the release at the site, and that he was not in a position to pay for response costs. Pennwalt failed to respond within the time period specified, and EPA initiated the RI/FS using CERCLA funds.

During the remedial planning phase, Pennwalt reviewed and provided comments on technical documents and on EPA's removal and remedial activities. In September 1987, EPA notified the PRPs of its intent to construct a security fence around the perimeter of the property under its removal authority. On November, 19, 1987, Pennwalt and EPA signed an agreement whereby Pennwalt agreed to reimburse EPA for costs related to the security fence installation.

EPA has an ongoing investigation to identify PRPs pursuant to Section 107(a) of CERCLA.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan (CRP) was released in April 1986, to ensure the public opportunities for involvement in site-related decisions, including site analysis and characterization, alternatives analysis, and remedy selection. In addition, the CRP was used by EPA to determine, based on community interviews, activities to ensure public involvement; and to provide opportunities for the community to learn about the site. Several public meetings were held during the RI/FS to keep the community informed on the progress of EPA's activities at the site.

The RI/FS report and the Proposed Plan for the Myers Property site were released to the public for comment on July 12, 1990. These two documents were made available to the public in both the administrative record and at information repositories maintained at the EPA Docket Room in Region II and at the Hunterdon County Public Library, Route 12, Flemington, New Jersey. The notice of availability for these two documents was published in the Hunterdon County Democrat on July 19, 1990. A public comment period on the documents was initially scheduled from July 13, 1990 to August 13, 1990, however, the public comment period was extended through September 12, 1990, at the request of Atochem. In addition, a public meeting was held on July 24, 1990. At this meeting, representatives from EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) answered questions about problems at the site and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

SCOPE OF OPERABLE UNIT WITHIN SITE STRATEGY

As with many Superfund sites, the problems at the Myers Property site are complex. As a result, EPA organized the work into two operable units. This ROD addresses the first operable unit remedial activities for the site. It documents the selected, final remedy for the soils and sediments, buildings, and ground water in the shallow water-bearing zone. Contaminated soils pose a threat to human health and the environment at this site because of the risks from possible ingestion or dermal contact with the soils. The contaminated shallow water-bearing zone poses a threat to human health and the environment because of the potential for direct ingestion of contaminated water through potable wells that may become contaminated above health-based levels at some time in the future.

Contaminants were also detected in the bedrock water-bearing zone at highly elevated concentrations. However, the feasibility of complete remediation of the bedrock ground water cannot be fully assessed at this time, based on the hydrogeologic information presently available and the known extent of bedrock ground water contamination. Therefore, this ROD initiates interim remedial activities for the bedrock ground water, to prevent further contaminant migration and to initiate ground water restoration. While the purpose of the remedial action is to achieve the basic goal of ground water restoration, it does not constitute a final action for ground water at the site. Monitoring of the bedrock water-bearing zone over the interval of the interim action will identify the need for further action.

The second operable unit will evaluate the ground water remedial action for the bedrock, during and after an estimated five years of operation, and propose alternatives, as required, for modifying the interim approach into a final remedy for ground water. The contaminated bedrock water-bearing zone poses a threat to human health and the environment at this site because of the potential for direct ingestion of contaminated water through potable wells that may become contaminated above health-based levels at some time in the future. The second operable unit is expected to be the final response action for the site and will be the subject of another decision document.

SUMMARY OF SITE CHARACTERISTICS

An RI was performed at the Myers Property site to determine the type and concentrations of contaminants in the various media at the site and in the near vicinity of the site. Samples were collected from sediments deposited along natural surface water runoff pathways, and in Cakepoulin Creek. Surface and subsurface soil samples were collected at varying depths to bedrock. Water samples were collected from Cakepoulin Creek, on-site spring and drainage areas, shallow and bedrock ground water monitoring wells, and potable wells. In addition, air and building-surface wipe samples were collected inside on-site buildings, and fish tissue samples were collected from Cakepoulin Creek. Details of these sampling efforts may be found primarily in the RI/FS reports, however, some additional sampling of potable water, fish and other biota was performed separately from the RI/FS, and was reported in other documents included in the administrative record. Samples collected during the RI/FS were either analyzed through EPA's Contract Laboratory Program or tested on site using an EPA mobile laboratory.

The remediation of the site is complicated by the distribution of contaminants across a sensitive ecosystem, adjacent to residences, and within an area with complex hydrogeology. As a result, EPA decided to address the site by evaluating three types of contaminated media (soils and sediments, ground water, and buildings) individually with regard to the risks posed to human health and the environment, the potential for contaminant migration, and the development of remedial alternatives.

Soils and Sediments

Soils at the site consist of an average of eight feet (with maximum depths of 14 to 18 feet) of gravel, fill material, and unconsolidated clayey and silty soils, overlying a bedrock formation. Figure 3 shows a cross section of on-site soils in one part of the site. Soil and sediment contaminants include chlorinated pesticides (in particular, DDT and its breakdown products [DDD and DDE]), volatile and semivolatile organic compounds (in particular, chlorinated benzenes), polycyclic aromatic hydrocarbons (PAHs), dioxins and dibenzofurans, and inorganic compounds (in particular, arsenic, cadmium, copper, and lead). A summary of surface soil contaminants found on three different areas of the site (the home/warehouse/barn area, the floodplain area, and the wetland area) is presented in Tables 1 through 3. Figure 2 shows the approximate areal extent of soil contamination.

The highest concentrations of organic and inorganic contaminants were found near the former industrial-use buildings on the site, however, contaminants were found to be evenly distributed over an extensive area, covering approximately 7.5 acres, and extending to the depth of bedrock. Trace concentrations of pesticides and other organic compounds and metals were identified in sediment samples collected in Cakepoulin Creek, with higher concentrations in spring drainage pathways on the site. Tables 4 and 5 summarize contaminants found in sediments in the Creek and the on-site spring and drainage ditch. Figure 4 shows the approximate sediment sampling locations.

DDT was the most pervasive soil contaminant identified, measured in high concentrations (up to 25,860 milligrams per kilogram, [mg/kg]) in soils across the site and to the depth of bedrock. DDT slowly degrades in the environment into DDD and DDE; both breakdown products were found distributed across the site in concentrations proportionate to concentrations of DDT. Chlorinated benzenes, and in particular hexachlorobenzene, were also found to be widely distributed across the site. Hexachlorobenzene was found at a maximum concentration of 25,000 mg/kg. The total volume of contaminated soils present above NJDEP soil action levels has been estimated to be approximately 75,000 cubic yards.

Both carcinogenic and non-carcinogenic PAHs were found at the site, and chlorinated dioxins and dibenzofurans were found at trace levels in the soil in some areas. The highest concentration of 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD), the most toxic form of dioxin (210 different chlorinated dioxins and dibenzofurans exist), was 6.7 micrograms per kilogram (µg/kg). PAHs and chlorinated dioxins and dibenzofurans were unevenly distributed across the site.

Inorganic compounds that were identified at elevated levels in soils and sediments at the site consisted of aluminum, antimony, arsenic, barium, lead, cadmium, and silver. Inorganic compounds were unevenly distributed across the site. Arsenic is thought to contribute to the potential carcinogenic risk at the site; antimony, barium, cadmium, lead, and silver are thought to contribute to the potential non-carcinogenic risks.

Resource Conservation and Recovery Act (RCRA) listed wastes have not been identified at the site.

The organic contaminants found in the soil are, for the most part, highly insoluble in water. Therefore, they are not likely to migrate by surface or ground water pathways. The potential pathways for surface migration are through sediment migration or wind-borne soil. Sampling of Cakepoulin Creek sediments, and sediments from a spring drainage ditch, identified low-level contamination, suggesting that surface water runoff is contributing to the migration of contamination.

DDT, DDD, and DDE are classified as probable human carcinogens, and can be absorbed by humans through oral or dermal exposure. The non-carcinogenic risk of human exposure to low levels of these chemicals is thought to be low, however, DDT and its metabolites can be stored in adipose (i.e., fatty) tissue, where residues can persist for many years.

Surface Water and Ground Water

No volatile organic compounds (VOCs) or pesticides, and only trace concentrations of inorganic compounds, were found in surface water samples. Surface water sampling data is summarized on Tables 4 and 5. Fish samples collected from the stream showed detectable levels of DDT and other site-related contaminants. However, fish samples from other reaches of Cakepoulin Creek have shown similar levels of these contaminants. Table 6 summarizes fish tissue samples analyzed as part of the RI/FS.

The water table is at an average depth of about five feet. There appears to be good ground water communication between the unconsolidated surface soils and the bedrock. In the bedrock, ground water travels through interconnected openings called fractures, which are primarily oriented from northwest to southeast. Ground water flow in the bedrock is primarily controlled by the fracture systems. In the surficial soils, ground water flows toward Cakepoulin Creek.

Ground water sampling has revealed high concentrations of monochlorobenzene and other VOCs, along with lower levels of DDT, TCDD, and metals in monitoring wells located on the site, to a depth of about 30 to 40 feet. Ground water samples obtained from both the shallow and bedrock water-bearing zones were found to be highly contaminated with organic and inorganic contaminants. Sampling of wells located north and east of the site has shown non-detectable or trace levels of contamination. Although Cakepoulin Creek is hydraulically connected to the zone of contaminated ground water, no contaminants have been detected in the stream water. Figure 5 shows the location of shallow and deep monitoring wells at the site. Table 7 summarizes data from two rounds of monitoring well sampling.

DDT, DDD, and DDE do not easily leach through soil to reach ground water. DDT has a low water-solubility and adsorbs strongly to natural organic matter in soil. Therefore, when applied to soil, DDT normally remains in the upper few inches. However, the presence of organic solvents, such as benzene and chlorobenzene, in the ground water may have decreased the soil adsorption rate of DDT and increased its mobility, providing a potential mechanism by which DDT and related chemicals migrated into ground water.

The concentrations of chlorobenzene in the ground water are high enough to suggest the presence of a separate layer of organic compounds, composed primarily of chlorobenzene and benzene. Because chlorobenzene is denser than water and not highly soluble, this separate layer, referred to as a dense non-aqueous phase liquid (DNAPL), will tend to sink down into the bedrock water-bearing zone until it reaches low points in fractures. DNAPLs tend to travel downward under the effect of gravity, as opposed to horizontally in the direction of ground water flow. However, ground water will cause the DNAPL to slowly dissolve, and the dissolved plume will travel with the ground water. DNAPL sources of ground water contamination are very difficult to locate and remove, especially in fractured bedrock zones.

Residential wells in the area have been monitored periodically for the presence of contaminants. One sampling event (September 1989) identified the presence of trace concentrations of chlorobenzene (the maximum detected concentration was 18 $\mu g/l$, which exceeds the State drinking water standard of 4 $\mu g/l$) in three of seven private wells sampled. However, a subsequent sampling event (December 1989), and all previous sampling events, showed non-detectable levels in all private wells. Although no private drinking water wells are currently contaminated, the potential exists for the future contamination of residential wells above health-based criteria. Table 8 summarizes data from one round of local potable well sampling collected during the RI.

Buildings

The mill and warehouse buildings on the site are contaminated with DDT, DDD, DDE, hexachlorobenzene, and metals. One wipe sample collected from the warehouse had a DDT concentration of 3,833 micrograms per square foot (μg/sq ft). Arsenic, cadmium, chromium, lead, and zinc were found in mill and warehouse wipe samples. The on-site residence also contains low levels of DDT contamination, though the contaminant levels detected do not pose an imminent threat to human health. The highest concentration of DDT was 5.17 μg/sq ft, found near the entrance to the Myers' home. The two small, wooden buildings were not sampled, but are presumed to be contaminated as well. Table 9 summarizes the results of dust sampling in buildings.

Air samples collected in the buildings were analyzed for asbestos, polychlorinated byphenyls, and pesticides. The analytical results indicated no detectable concentrations of these constituents in any of the air samples.

SUMMARY OF SITE RISKS

A public health evaluation and environmental assessment (PHE) was considered together with the RI to determine the remedial objectives at the Myers Property site. The PHE evaluates the magnitude of public heath impact if no remediation were to be conducted at the site. The risk assessment process involves: 1) identification of site-specific indicators, 2) identification of potential exposure points and intakes, 3) calculation of potential non-carcinogenic hazard indices and carcinogenic risks, and 4) comparison of actual site concentrations of compounds with applicable, or relevant and appropriate requirements.

Contaminants of Concern

In evaluating potential contaminants of concern, the focus was on identifying contaminants in each of the contaminated media, evaluating pathways of exposure (i.e., ways in which humans and environmental receptors [fish, birds, mammals, etc.] may come in contact with contaminants), and quantifying the degree to which that contact poses a risk.

The frequencies of detection, concentration ranges, and concentrations above background in each medium were used to determine contaminants of concern. Table 10 lists the contaminants of concern for the site, by media.

Media of Concern

Contaminated surface soils, spring and drainage sediments, building dusts, and ground water were all considered media of concern at the site. Risks from chemicals detected from subsurface soils were not quantified in the PHE since any estimated potential exposures would be to surface soils only. The subsurface soils findings were discussed to trace any vertical migration of chemicals from surface soil to ground water.

Toxicity Assessment

For risk assessment purposes, individual pollutants are separated into two categories of health hazard depending on whether they exhibit carcinogenic or non-carcinogenic effects. This distinction relates to the currently held scientific opinion that the mechanism of action for each category is different.

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting non-carcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals, that are not likely to be without an appreciable risk of adverse health effects. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse non-carcinogenic effects to occur.

Table 11 lists health effects criteria (RfDs and CPFs) for the contaminants of potential concern at the site.

Exposure Pathways

An exposure pathway is defined by four elements: (1) a source and mechanism of chemical release to the environment; (2) an environmental transport medium for the release chemical; (3) a point of potential exposure by receptors with the contaminated medium; and (4) a route of exposure (e.g., ingestion or adsorption of soil). A pathway is considered "complete" if all of these elements are present.

Under current conditions at the site, potentially complete pathways involve exposures to surface soil on three different areas of the site (the home/warehouse/barn area, the floodplain area, and the wetland area), to surface water and sediments from both Cakepoulin Creek and the spring and spring drainage area, to dust in the buildings on the site, and to fish caught in Cakepoulin Creek. In addition, potential exposure pathways may evolve if undeveloped areas of the site were to be developed residentially in the future. Such pathways might include more extensive exposure by adults and children pursuing activities under residential conditions in the floodplain or wetlands area, as well as exposure to contaminated ground water. These pathways characterize hypothetical exposure scenarios that cannot be ruled out if no remedial activities were conducted on the Myers Property site and no restrictions were placed on its use (the No Action Alternative).

Exposures were expected to be different for adults and children living in the area because of different behavioral patterns. For this reason, exposures were calculated separately for children living on the site (up to age 18), trespassing children (ages 6 to 14), and lifetime residents (children through adults).

Exposure pathways are presented in Table 12 for current-use and future-use scenario pathways.

To quantitatively assess the potential risks to human health associated with the current-use and future-use exposure scenarios considered in this assessment, the concentrations of chemicals in relevant environmental media at points of potential exposure are converted to chronic daily intakes (CDIs). CDIs are expressed as the amount of a substance taken into the body per unit body weight per unit time, or milligram per kilogram per day. A CDI is averaged over a lifetime for carcinogens and over the exposure period for non-carcinogens. In general, for potential carcinogens, excess lifetime cancer risks are obtained by multiplying the daily intake of the contaminant under consideration by its CPF. Potential risks for non-carcinogens are presented as the ratio of the CDI exposure to the RfD.

For each exposure pathway, a number of assumptions for use in the exposure assessment were made for both the average and the plausible maximum exposure case. For direct contact with soils, the potential for exposure was divided into dermal contact and soil ingestion. The following assumptions were made for each case: duration of exposure; frequency of exposure; body weight over period of exposure; incidental soil ingestion rate; relative bioavailability/percent absorbed from ingested soil; soil contact rate for dermal adsorption; and the percent of chemical adsorbed dermally. Similar assumptions were applied to sediments, considering dermal exposure only. For direct contact with dust in buildings, the potential for exposure was divided into dermal contact and dust ingestion, and the assumptions used are similar to those for direct contact with soils.

For ingestion of fish, the potential for exposure was based on the following assumptions: duration of exposure; frequency of exposure; body weight; fish ingestion rate; and the relative bioavailability of ingested chemicals.

For inhalation of wind-eroded particulate matter from the site, the potential for exposure was based on the following assumptions: chemical concentration in air (calculated using a combined soil emissions/air dispersion model); inhalation rate; and body weight.

Under the future use ground water ingestion scenario, the average individual is assumed to weigh 70 kilograms and drink two liters of water per day for 70 years.

Human Risk Characterization

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., $1x10^{-6}$ or 1E-6). An excess lifetime cancer risk of $1x10^{-6}$ indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

Potential concern for non-carcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) (or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The current and future land use for the site is considered to be residential. Under plausible maximum exposure conditions, the estimated total excess cancer risk posed by the site through contact with site soils is $1x10^{-3}$ for lifetime residents and between $1x10^{-3}$ and $3x10^{-4}$ for children; higher risk ranges ($7x10^{-2}$ and $6x10^{-2}$, respectively) are posed under future land use conditions. The future-use scenario for drinking water under plausible maximum exposure conditions estimates a total excess cancer risk of $4x10^{-1}$. Table 13 outlines the quantified carcinogenic and non-carcinogenic risks associated with 13 different current-use and future-use exposure scenarios for the site.

For the current and future land use surface soil exposure scenarios, the main chemicals contributing to these risks were DDT and its breakdown products, 2,3,7,8-TCDD, hexachlorobenzene, arsenic and lead. The dominant chemicals in the risk determination for the on-site spring and spring drainage sediments were dioxins and dibenzofurans.

While a quantifiable human health risk is shown for consumption of fish from the stream, the concentrations of site-related contaminants in edible fish tissue were below health-based standards established by the Food and Drug Administration. In addition, fish samples from other reaches of Cakepoulin Creek have shown similar levels of these contaminants, and the low-level contamination in fish cannot be identified as site related.

Both carcinogenic and non-carcinogenic risks associated with site-related contaminants exceed EPA's recommended guidelines for protection of human health for surface soils, spring and drainage sediments, building dust, and ground water. If remediation of these media is not conducted, elevated carcinogenic and non-carcinogenic risks will remain and further releases of contaminants into the surrounding environment will occur.

Environmental Risks

The Myers Property site is located in the floodplain of Cakepoulin Creek. The majority of the on-site area (within the Myers property line) is disturbed. The NJDEP Division of Fish, Game and Wildlife (NJDFGW) characterizes the wetlands to the south of the Myers property as a closed-canopy, hardwood lowland, corresponding to the reach adjacent to Cakepoulin Creek. NJDEP considers this area to be a critical habitat for a number of migratory and native species. Cakepoulin Creek provides good habitat for trout, and is stocked by the NJDFGW with brown, brook, and rainbow trout. Reproducing populations of brown trout also occur in the stream, along with a number of other native species.

The U.S. Department of Interior, Fish and Wildlife Service, has informed EPA that, with the exception of occasional transient species, no proposed threatened or endangered flora or fauna known to exist near the Myers Property site. In addition, no Federal endangered or threatened species or State endangered species occur near the Myers Property site. State threatened species which occur near the site include the red-shouldered hawk, barred owl, grasshopper sparrow, long-tailed salamander, and wood turtle.

Absolute conclusions regarding the potential environmental impacts of the Myers Property site cannot be made because there are many uncertainties surrounding the estimates of toxicity and exposure. However, it is possible to estimate that woodcocks and shrews feeding on earthworms from the contaminated areas of the site, and kingfishers and mink feeding on fish from Cakepoulin Creek, may be at increased risk of adverse impacts due to the bioaccumulation tendency of site contaminants (e.g., DDT and its breakdown products).

Two environmental evaluations were performed at the Myers Property site in addition to the RI/FS. In October and November 1988, EPA's Environmental Response Team (ERT) collected a number of small mammals in order to evaluate the amount of DDT being bioaccumulated in those species. This study determined that, while the animals collected did have elevated levels of DDT, the concentrations were not as high as what had been predicted. A natural resource risk assessment performed by NJDEP did not identify a significant risk to higher predators as a result of exposure to site contamination.

In March 1989, ERT collected additional fish samples from the Creek to test for chlorinated dioxins and dibenzofurans (the RI fish samples had not been tested for these chemicals) and to better characterize the natural resource impact of the site. This second study found similar concentrations of DDT, dioxins, and other chemicals in fish samples collected from the stream. NJDEP's natural resource risk assessment did not identify a significant risk to local aquatic populations as a result of site-related contaminants. Because fish samples from other reaches of Cakepoulin Creek have shown similar levels of these contaminants, the low-level contamination in fish is not considered site related.

Uncertainties in Risk Assessment

There is substantial uncertainty in many of the assumptions used for the quantification of the exposure pathways for the Myers Property site. Aside from the general uncertainties with assumptions used in the risk assessment procedure, significant dioxin and dibenzofuran data validation problems resulted in only maximum case exposure calculations in all scenarios except surface soils. The conservative approach often results in an overestimation of risks in these scenarios. It should be noted that the PHE was conducted using relatively conservative assumptions according to the general guidelines outlined by EPA. The purpose of using conservative assumptions is to explore the potential for adverse health effects using conditions that tend to overestimate risk so that the final estimates will usually be near or higher than the upper end of the range of actual exposures and risks. As a result, the PHE should be considered a conservative analysis intended to indicate the potential for adverse impacts to occur.

Conclusion

Based on the results of the public health evaluation, EPA has concluded that the site poses a significant human health risk. The contaminants found at the site are known to cause both carcinogenic and non-carcinogenic health effects. Because the site is located in a residential/agricultural community, and is presently used as a residence, the health evaluation placed particular emphasis on risks to adults and children living on and near the site. The health evaluation identified a number of activities that, if undertaken at the site, may lead to what EPA considers an unacceptable health risk. These activities involve contact with contaminated soils, sediments from the spring and spring drainage area, and contact with contaminated building surfaces. In addition, an unacceptable health risk would result should individuals come in contact with contaminated ground water at some time in the future.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF ALTERNATIVES

This section describes the remedial alternatives which were developed, using suitable technologies, to meet the objectives of CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP). These alternatives were developed by screening a wide range of technologies for their applicability to site-specific conditions and evaluating them for effectiveness, implementability, and cost. A comprehensive list of remedial technologies was screened to characterize each technology and determine its applicability to the site. The information obtained from the RI was used to conduct the FS. The treatment combinations and disposal/discharge options described separately in the FS were combined to develop comprehensive remedial alternatives for soils and sediments, buildings, and ground water.

The draft FS report provides a detailed evaluation of remedial alternatives to remediate the site. Remedial alternatives were evaluated based on the nine criteria identified in the FS report and described later in this document. The FS evaluated, in detail, seven alternatives for remediating soils and sediments, five alternatives for remediating the ground water, and four alternatives for remediating contaminated buildings on the Myers Property. The remedial alternatives, as presented in the FS, include:

Soils and Sediments Remediation Alternatives

Alternative 1	No Action - Soils and Sediments
Alternative 2	Institutional Controls - Soils and Sediments
Alternative 3	Excavation and Off-site Disposal
Alternative 4	Excavation, On-site Soil Washing, and On-site Placement of Treated Soils
Alternative 5	Excavation, On-site Chemical Dechlorination Using Nascent State Hydrodechlorination, and On-site Backfilling of Treated Soils
Alternative 6	Excavation, On-site Thermal Treatment, and On-site Backfilling of Treated Soils
Alternative 7	Excavation, On-site Chemical Dechlorination Using APEG, and On-site Backfilling of Treated Soils

Ground Water Remediation Alternatives

Alternative 8	No Action - Ground Water
Alternative 9	Institutional Controls - Ground Water
Alternative 10	Extraction, Physical Treatment and Discharge
Alternative 11	Extraction, Chemical Treatment and Discharge
Alternative 12	Extraction, Biological Treatment and Discharge

Building Remediation Alternatives

Alternative 13	No Action - Buildings
Alternative 14	Institutional Controls - Buildings

Alternative 15 Decontamination

Alternative 16 Dismantlement

Two soils and sediments alternatives from the FS (Alternatives 5 and 7) were considered sufficiently similar to be presented and considered as a single remedial alternative in the Proposed Plan and here as Alternative 5.

Soils and Sediments Remediation Alternatives

EPA and NJDEP have established a remedial action objective to eliminate the risk of inadvertent contact with or ingestion of contaminated soils. To meet this objective, EPA and NJDEP established cleanup goals for organic and inorganic contaminants in soils at the Myers Property site. These goals will be achieved in the soil down to the seasonal average water table (a depth of approximately five feet). This will reduce the cancer risk from incidental contact with contaminated soils and sediments to the 10^{-6} range. Table 14 lists cleanup goals for soils, and on-site spring and drainage sediments at the site.

Remediation of DDT and other organic compounds below the water table is not a remedial action objective since human contact is unlikely, and because it is not considered a significant source of ground water contamination.

Sediments in Cakepoulin Creek are contaminated with only trace concentrations of site-related pollutants, which pose no adverse risk to human health or the environment. Therefore, excavation of contaminated sediments from Cakepoulin Creek is not warranted. However, contaminated sediments found in a spring drainage ditch to the south of the site are considered a potential human health risk for children playing in the area and, therefore, are included in the remedial action objective for the contaminated soils.

Alternative 1 No Action - Soils and Sediments

Estimated Capital Cost:	$ 0
Estimated Annual Operation & Maintenance (O & M) Costs:	$ 76,000
Estimated Present Worth Cost:	$716,000
Estimated Monitoring Timeframe:	30 years

A No Action alternative is evaluated at every Superfund site to establish a baseline for comparison of the remedial alternatives. Under this alternative, EPA would take no further action to address contamination at the site. Environmental (soils and sediments) monitoring would be included.

The health and environmental risk posed by the presence of contaminated soils and on-site sediments, as discussed in the PHE, would not be reduced through this alternative. The soil cleanup objectives would not be met.

Alternative 2 Institutional Controls - Soils and Sediments

Estimated Capital Cost:	$ 36,000
Estimated Annual O & M Costs:	$ 76,000
Estimated Present Worth Cost:	$752,000
Estimated Monitoring Timeframe:	30 years

Under this alternative, no remedial actions would be taken. On-site residents would need to permanently relocate, deed restrictions on future use of the property would be sought, a permanent fence would enclose the area of contaminated soils, and periodic monitoring of soils and sediments would be performed.

The health and environmental risks posed by the presence of contaminated soils and on-site sediments would be reduced to some degree through the implementation of institutional controls. Therefore, this alternative would somewhat satisfy the remedial action objective for soils and sediments, however, the soil cleanup goals would not be achieved with this alternative.

Alternative 3 Excavation and Off-site Disposal

Estimated Capital Cost:	$31,500,000
Estimated Annual O & M Costs:	$ 29,000 (5 years)
Estimated Present Worth Cost:	$31,600,000
Estimated Implementation Timeframe:	1 year

Contaminated soils would be excavated to cleanup goals, staged, and transported to an approved off-site landfill or treatment facility. Contaminated stream sediments and soils below the water table would remain on site. For cost estimating purposes, 48,700 cubic yards of contaminated soil, corresponding to an excavation to the water table and to the established cleanup goals. The excavated soils and sediments would be transported off site.

The O & M costs include post-remediation monitoring costs to assure the effectiveness of the remedial action. It is anticipated that monitoring would be performed annually for five years.

The off-site landfill or disposal facility would be a permitted RCRA hazardous waste facility. However, the media of concern are not RCRA listed waste, and are considered CERCLA soil and debris. Therefore, the Land Disposal Restrictions (LDRs) are not applicable. If the soils and sediments prove to be characteristic wastes (based on the Toxicity Characteristic

Leaching Procedure [TCLP]), RCRA hazardous waste restricted under the LDRs, or California List wastes, then LDRs may be considered relevant and appropriate.

The health and environmental risks posed by the presence of contaminated soils and on-site sediments would be addressed through the implementation of this alternative. Therefore, this alternative would satisfy the remedial action objective for soils and sediments. Soil cleanup goals would be achieved with this alternative.

Alternative 4 Excavation, On-site Soil Washing, and On-site Backfilling of Treated Soils

Estimated Capital Cost:	$26,044,000*	
Estimated Annual O & M Costs:	$ 29,000	(5 years)
Estimated Present Worth Cost:	$26,128,000	
Estimated Implementation Timeframe:	3 years	

*Includes the estimated construction and operation costs of a soils treatment facility for three years.

Contaminated soils would be excavated and transported to an on-site soil washing facility. This technology removes fine soil particles, to which most of the contaminants are attached, by washing with water. In addition, contaminants can be solubilized with a water/reagent solution and washed from the soils in a liquid phase. Coarser silts and sands can be tested and returned to the site, and the fines sent off site for disposal in a RCRA-permitted facility. The wash water would require treatment to remove contaminants and reagents prior to reuse, creating a concentrated waste stream requiring off-site disposal. For cost estimating purposes, 48,700 cubic yards of contaminated soil, corresponding to an excavation to the water table and to the established cleanup goals. The washed soils would be tested and returned to the site. This technique is expected to be effective for both DDT- and dioxin-contaminated materials.

Treatability studies may be required for this alternative to determine the size of units and the need for soil washing reagents. In addition, treatability studies would be required to determine the volume of, and contaminants remaining in the soil fines and concentrated waste stream prior to off-site disposal.

The O & M costs include post-remediation monitoring costs to assure the effectiveness of the remedial action. It is anticipated that monitoring would be performed annually for five years.

A permitted RCRA hazardous waste facility would be used for the off-site disposal of concentrated waste streams. The contaminated soils and sediments are considered CERCLA soil and debris, but not RCRA listed waste, and LDRs are not applicable for the treated soil, fines, or the concentrated waste stream. If the treated soils or if a waste stream prove to be characteristic waste (based on TCLP), RCRA hazardous waste restricted under the LDRs, or California List wastes, then LDRs may be considered relevant and appropriate.

The health and environmental risk posed by the presence of contaminated soils and on-site sediments would be addressed through treatment to achieve cleanup goals. Therefore, this alternative would satisfy the remedial action objective for soils and sediments.

Alternative 5 Excavation, On-site Chemical Dechlorination, and On-site Backfilling of Treated Soils

Estimated Capital Cost:	$25,947,000*
Estimated Annual O & M Costs:	$ 29,000 (5 years)
Estimated Present Worth Cost:	$26,308,000
Estimated Implementation Timeframe:	2 years

*Includes the estimated construction and operation costs of a soils treatment facility for two years.

Contaminated soils would be excavated and treated on site by an innovative process that dechlorinates organic molecules. For cost estimating purposes, 48,700 cubic yards of contaminated soil, corresponding to an excavation to the water table and to the established cleanup goals. Treated soils would be tested and returned to the site.

Excavated soils would be fed into an on-site chemical dechlorination reactor unit. Two processes (APEG and nascent state hydrodechlorination) have been demonstrated to be effective at treating DDT-contaminated soils from the site by means of bench-scale treatability studies. Both APEG (which refers to the active process reagent: alkali polyethylene glycol) and nascent state hydrodechlorination apply a process whereby chlorine atoms are removed from chlorinated compounds such as DDT, to render compounds that are safer and more easily biodegraded in the environment. The treatability study results showed that DDT, DDD, DDE, and hexachlorobenzene can be dechlorinated to less than 10 mg/kg. Washing to remove process reagents and soluble reaction by-products can be adapted to extract inorganic contaminants from the soil prior to returning it to the site. Both processes are expected to be effective at treating dioxins and dibenzofurans.

A pilot study would be performed during design to select one of these processes and to refine the treatment system prior to full-scale implementation. A component of the pilot study would be to perform additional toxicity screening on treated soils to demonstrate technology effectiveness prior to full-scale implementation. The soil pH would be neutralized prior to backfilling on site, coupled with leachate testing to demonstrate that treated soils would not contribute to ground water contamination. Process fluids may require off-site disposal. Wash water from the chemical dechlorination process would be treated on site using a conventional method similar to those discussed in the ground water treatment alternatives, and discharged either to ground water or to Cakepoulin Creek.

The O & M costs include post-remediation monitoring costs to assure the effectiveness of the remedial action. It is anticipated that monitoring would be performed annually for five years.

Off-site disposal of the concentrated process fluids (containing inorganic and dechlorinated organic compounds) would be at a permitted RCRA hazardous waste facility. The contaminated soils and sediments are considered CERCLA soil and debris, but not RCRA listed waste, and LDRs are not applicable for the treated soil or any concentrated waste streams. If the treated soils or if a waste stream prove to be characteristic waste (based on TCLP), RCRA hazardous waste restricted under the LDRs, or California List wastes, then LDRs may be considered relevant and appropriate.

The health and environmental risk posed by the presence of contaminated soils and on-site sediments would be addressed through treatment to achieve soil cleanup goals. Therefore, this alternative would satisfy the remedial action objective for soils and sediments.

Alternative 6 Excavation, On-site Thermal Treatment, and On-site Backfilling of Treated Soils

Estimated Capital Cost:	$31,388,000*	
Estimated Annual O & M Costs:	$ 29,000	(5 years)
Estimated Present Worth Cost:	$31,472,000	
Estimated Implementation Timeframe:	3 years	

*Includes the estimated construction and operation costs of a soils treatment facility for three years.

Contaminated soils would be excavated and transported to an on-site, mobile thermal treatment unit. For cost estimating purposes, 48,700 cubic yards of contaminated soil, corresponding to an excavation to the water table and to the established cleanup goals. Treated soil would be tested, stabilized, if necessary, and returned to the site. Thermal treatment would be effective for both DDT- and dioxin-contaminated soils.

The O & M costs include post-remediation monitoring costs to assure the effectiveness of the remedial action. It is anticipated that monitoring would be performed annually for five years.

The contaminated soils and sediments are considered CERCLA soil and debris, but not a RCRA listed waste, and LDRs are not applicable for the treated soil. If, after thermal treatment, the media prove to be characteristic waste (based on TCLP), RCRA hazardous waste restricted under the LDRs, or California List wastes, then LDRs may be considered relevant and appropriate. Thermally treated soil containing inorganic contaminants above the cleanup goals established for this site would be stabilized, as necessary, prior to on-site backfilling or off-site disposal.

The health and environmental risk posed by the presence of contaminated soils and on-site sediments would be addressed through treatment to achieve soil cleanup goals. Therefore, this alternative would satisfy the remedial action objective for soils and sediments.

Alternative 7

[Alternative 7 from the FS report has been incorporated in Alternative 5 above.]

Ground Water Remediation Alternatives

Because the bedrock water-bearing zone is a Class II-A aquifer and is also a sole source of drinking water for the community, EPA and NJDEP have established a remedial action objective for the contaminated ground water: to prevent exposure to contaminated ground water above Maximum Contaminant Levels (MCLs) established pursuant to Federal and State Safe Drinking Water Acts (i.e., drinking water standards).

While it is believed that this objective can be achieved for the shallow water-bearing zone, it is presently not possible to predict whether it can be achieved in the contaminated bedrock water-bearing zone within a reasonable period of time. The uncertainty of achieving this objective in the bedrock water-bearing zone is because of the difficulty in locating fractures containing contaminated ground water, and in sufficiently influencing the ground water in the fractures to capture the contamination. In addition, DNAPLs are difficult to locate and extract from fractured bedrock.

However, ground water extraction and treatment systems have been effective at plume containment to prevent further migration and in achieving significant reductions of contaminant mass. At this site, pumping highly contaminated ground water will begin to remove contamination and may prevent the dissolved plume from dispersing from the area. Therefore, it has been determined that alternatives to address the "final" action for the shallow water-bearing zone to achieve drinking water criteria, and to perform an "interim" action for the bedrock water-bearing zone to obtain sufficient information by actual pump and treat experience to evaluate a "final" remedy for the bedrock water-bearing zone, would be evaluated in the feasibility study and this ROD.

Alternative 8 No Action - Ground Water

Estimated Capital Cost:	$ 0
Estimated Annual O & M Costs:	$ 227,000
Estimated Present Worth Cost:	$2,140,000
Estimated Monitoring Timeframe:	30 years

As with the Soils and Sediments Remediation Alternatives, a No Action alternative for ground water was evaluated to establish a baseline for comparison with other ground water remediation alternatives. Under the No Action alternative, EPA would not take any action to remediate or control the ground water contamination at the site. The No Action alternative would consist of ground water monitoring only. The operation and maintenance requirements include the labor and analytical services needed to conduct periodic sampling of the shallow ground water, as well as the deeper, bedrock ground water and off-site private potable wells. Public health assessments would also be performed periodically.

The health and environmental risk posed by the presence of contaminated ground water, as discussed in the PHE, would not be reduced through this alternative.

Alternative 9 Institutional Controls - Ground Water

Estimated Capital Cost:	$ 120,000
Estimated Annual O & M Costs:	$ 441,000
Estimated Present Worth Cost:	$4,277,000
Estimated Monitoring Timeframe:	30 years

No remedial actions would be undertaken; however, measures would be taken to reduce the potential risk to public health and the environment, including installation and monitoring of sentinel wells. Also, periodic sampling of private wells would be included. A contingency to this alternative would be the provision of point-of-use treatment to residential wells should drinking water supplies become contaminated or threatened.

The primary remedial action objective for ground water would be satisfied through this alternative, because ingestion of contaminated water would be prevented.

Alternative 10 Extraction, Physical Treatment and Discharge

Estimated Capital Cost:	$ 3,427,000	
Estimated Annual O & M Costs:	$ 3,024,000	(5 years)
Estimated Annual Monitoring Costs:	$ 441,000	(30 years)
Estimated Present Worth Cost:	$18,397,000	
Estimated Implementation Timeframe:	5 years	

A temporary shallow ground water barrier would be installed around the affected area. A trench and/or shallow ground water extraction wells would be placed within this barrier to control shallow ground water flow and to facilitate extraction of shallow ground water for treatment. For cost estimation purposes, a treatment scheme has been developed consisting of metals removal by weak acid cation exchange and activated alumina, and organics treatment by granular activated carbon (physical treatment). Heavy metal sludge and spent carbon would be disposed of off site in accordance with RCRA ARARs (e.g., LDRs) and treated water discharged to ground water through injection wells or infiltration galleries.

The location of infiltration galleries or injection wells would be determined in remedial design. It may also be possible to discharge treated water to Cakepoulin Creek, if it can be demonstrated that a treatment technology can comply with NJDEP's surface water discharge requirements. However, treated water discharge to ground water has been assumed here for cost estimation purposes, based on compliance with Federal and New Jersey MCLs and New Jersey Ground Water Quality Criteria listed in Table 15.

Under this alternative, exploratory ground water pumping wells would be installed in the area of highest contaminant concentration in the bedrock water-bearing zone, in an attempt to contain and remove contamination from that water-bearing zone. Also, periodic sampling of private wells would be included.

A contingency to this alternative would be the provision of point-of-use treatment to residential wells should drinking water supplies become contaminated or threatened. Therefore, the primary remedial action objective for ground water would be satisfied through the implementation of this alternative, because ingestion of contaminated water would be prevented.

Annual O & M costs would be incurred during operation of the extraction, treatment, and discharge systems. Ground water monitoring would be used to evaluate the effectiveness of the remedial alternative. Five years of system operation, and thirty years of periodic monitoring, have been assumed here for cost estimating purposes.

Alternative 11 Extraction, Chemical Treatment and Discharge

Estimated Capital Cost:	$ 5,085,000	
Estimated Annual O & M Costs:	$ 4,048,000	(5 years)
Estimated Annual Monitoring Costs:	$ 441,000	(30 years)
Estimated Present Worth Cost:	$23,960,000	
Estimated Implementation Timeframe:	5 years	

The alternative is basically the same as Alternative 10, with the exception that effluent from the metals removal units would be first processed through an ultraviolet/hydrogen peroxide (UV/H_2O_2) device prior to activated carbon polishing. UV/H_2O_2 treatment would enhance the destruction of organic contaminants. Ultraviolet light reacts with hydrogen peroxide to form hydroxyl radicals, very powerful chemical oxidants, which then react with the organic contaminants in the water. In an optimized unit, the reaction by-products would be carbon dioxide and water, with no residual waste stream. A treatability study would be required to assess the destruction of organic chemicals to achieve the NJDEP health-based ground water remediation goals prior to discharge and to identify preliminary design requirements. Residuals that would require off-site disposal in accordance with RCRA ARARs include heavy metal sludge and spent carbon. For cost estimating purposes, five years of O & M for the extraction, treatment, and discharge systems have been assumed. It is estimated that ground water monitoring would be conducted for thirty years.

Alternative 12 Extraction, Biological Treatment and Discharge

Estimated Capital Cost:	$ 3,502,000	
Estimated Annual O & M Costs:	$ 3,228,000	(5 years)
Estimated Annual Monitoring Costs:	$ 441,000	(30 years)
Estimated Present Worth Cost:	$19,268,000	
Estimated Implementation Timeframe:	5 years	

The alternative is basically the same as Alternative 10, with the exception that effluent from the metals removal units would be first processed through an aerobic bioreactor and then filtered prior to activated carbon polishing. The function of the activated sludge treatment unit would be to break down organic contaminants through the activity of aerobic microorganisms, which metabolize biodegradable organics. A treatability study would be required to determine the type of bioreactor most suited to this type of waste. Residuals that would require off-site disposal in accordance with RCRA ARARs include excess bioreactor sludge, heavy metal sludge, and spent carbon. For cost estimating purposes, five years of O & M for the extraction, treatment, and discharge systems have been assumed. It is estimated that ground water monitoring would be conducted for thirty years.

Building Remediation Alternatives

The remedial objective for the buildings at the site is to prevent human contact with contaminated building surfaces and dust. No chemical-specific ARARs have been established for buildings.

Alternative 13 No Action - Buildings

Estimated Capital Cost:	0
Estimated Annual O & M Costs:	$ 2,000
Estimated Present Worth Cost:	$19,000
Estimated Monitoring Timeframe:	30 years

Under this alternative, no remedial action would be undertaken. The No Action alternative was evaluated for comparison purposes. Monitoring of site security is included.

The health and environmental risk posed by the presence of contaminated building dust, as discussed in the PHE, would not be reduced through this alternative. The remedial objective established for buildings would not be met through this alternative.

Alternative 14 Institutional Controls - Buildings

Estimated Capital Cost:	$113,000
Estimated Annual O & M Costs:	$ 2,000
Estimated Present Worth Cost:	$132,000
Estimated Monitoring Timeframe:	30 years

No remedial action would be undertaken. However, measures such as increased security and relocation of the Myers family from the on-site residence would be taken to reduce the potential risks to public health and the environment.

The remedial objective for contaminated buildings would be satisfied to some degree, because individuals would be restricted from access to contaminated buildings, thereby preventing contact with contaminated building dust.

Alternative 15 Decontamination

Estimated Capital Cost:	$1,213,000
Estimated Annual O & M Costs:	None
Estimated Present Worth Cost:	$1,213,000
Estimated Implementation Timeframe:	6 months

Gritblasting, wiping, and dusting, as appropriate, would be used to decontaminate the barn, warehouse, and on-site residence. The Myers family would be temporarily relocated during this action. Decontamination water would be treated on site using a conventional method similar to those discussed in the ground water treatment alternatives, and discharged either to ground water or to Cakepoulin Creek. Solid-phase contaminants would be disposed of as hazardous waste in accordance with RCRA ARARs. Treatability studies may be required prior to implementation of this alternative, to determine the most effective method of decontamination for each unique building material. It is anticipated that the remedial objective established for buildings would be met through this alternative.

Alternative 16 Dismantlement

Estimated Capital Cost:	$2,596,000
Estimated Annual O & M Costs:	None
Estimated Present Worth Cost:	$2,596,000
Estimated Implementation Timeframe:	1 year

All on-site buildings would be dismantled and the debris sent to the appropriate off-site municipal or hazardous waste landfill. Contaminated materials may be decontaminated prior to disposal off site. The costs for off-site disposal have been included. The Myers family would need to relocate from the on-site residence.

LDRs would not be ARARs for the dismantled building material. Testing prior to off-site disposal would determine the need for treatment prior to disposal. A treatability study may be required, as discussed in Alternative 15.

The remedial objective for contaminated buildings would be satisfied by removing contaminated media.

Summary of Comparative Analysis of Alternatives

The alternatives noted above were evaluated using criteria derived from the NCP (published in the Code of Federal Regulations at 40 CFR Part 300) and SARA. These criteria relate directly to factors mandated by SARA in Section 121, including Section 121 (b)(1)(A-G).

All selected remedies must at least attain the Threshold Criteria. The Selected Remedy should provide the best trade-offs among the Primary Balancing Criteria. The Modifying Criteria were evaluated following the public comment period.

Threshold Criteria

Overall Protectiveness of Human Health and the Environment - Protection of human health and the environment is the central mandate of CERCLA, as amended by SARA. Protection is achieved by reducing health and environmental threats and by taking appropriate action to ensure that, in the future, there would be no unacceptable risks to human health and the environment through any exposure pathway.

Compliance with Applicable or Relevant and Appropriate Requirements - Section 121(d) of CERCLA, as amended by SARA, requires that remedies for Superfund sites comply with Federal and State laws that are directly applicable and, therefore, legally enforceable. Remedies must also comply with the requirements of laws and regulations that are not applicable, but are relevant and appropriate; in other words, requirements that pertain to situations sufficiently similar to those encountered at a Superfund site such that their use is well suited to the site. Combined, these are referred to as "applicable or relevant and appropriate requirements".

There a several types of ARARs: action-specific, chemical-specific, and location-specific. Action-specific ARARs are technology or activity-specific requirements or limitations related to various activities. Chemical-specific ARARs are usually numerical values which establish the amount or concentrations of a chemical that may be found in, or discharged to, the ambient environment. Location-specific requirements are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely because they occur in a special location.

Primary Balancing Criteria

Long-Term Effectiveness and Permanence - This criterion addresses the residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

Reduction of Toxicity, Mobility or Volume Through Treatment - This criterion addresses the anticipated performance of the treatment technologies the remedy may employ.

Short-Term Effectiveness - This criterion addresses the period of time required to achieve protection and any adverse impacts on human health and the environment during the construction and implementation period (i.e., until cleanup goals are achieved).

Implementability - This criterion addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost - This criterion addresses the capital and O&M costs of the remedy, as well as a present worth.

Modifying Criteria

State Acceptance - This criterion addresses the support agency's comments and concerns.

Community Acceptance - This criterion addresses the public's comments on and concerns about the Proposed Plan and RI/FS report.

Analysis

Overall Protection of Human Health and the Environment

- Soils and Sediments Remediation Alternatives

All of the alternatives, with the exception of Alternative 1 (No Action) and Alternative 2 (Institutional Controls), would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment or engineering controls. Alternative 3 (Off-site Disposal) may provide the greatest overall protection at the site; however, the health risks would be transferred to the designated disposal facility. Alternative 5 (Chemical Dechlorination) would destroy the organic contaminants in the soil and remove the inorganic wastes to achieve cleanup goals, thereby eliminating long-term risks from direct contact and inhalation. Alternative 4 (Soil Washing) removes contaminants from soils and sediments but does not destroy them, and produces a concentrated residue which still requires off-site treatment and/or disposal. Alternative 6 (Thermal Treatment) would be as protective as Alternative 5, though metals would not be removed, and soil stabilization may be necessary prior to returning soil to the site.

- Ground Water Remediation Alternatives

Alternative 8 (No Action) would not provide protection of human health and the environment. No treatment would be provided, and only natural processes would attenuate ground water contamination. A long-term monitoring program would be necessary to determine the extent to which ground water and surface water contaminant concentrations would change with time, and to track the migration of contaminated ground water.

All other alternatives are protective of human health and the environment by providing sufficient indication of potential private well contamination, and by providing the contingency for point-of-use treatment should private drinking water wells become contaminated.

Alternatives 10, 11, and 12 are interim remedies for the bedrock water-bearing zone. The ultimate objective is to provide protection of human health by eliminating risks through the extraction and treatment of contaminated ground water. However, the potential for success of achieving overall protectiveness through treatment will be determined during implementation of the interim remedy. Alternatives 10, 11, and 12 would reduce the risk from using the ground water by reducing the level of contaminants within the affected water-bearing zones.

- Building Remediation Alternatives

All the alternatives, with the exception of Alternative 13 (No Action), are protective of human health.

Compliance with ARARs

- Soils and Sediments Remediation Alternatives

Chemical-specific ARARs - There are no promulgated numeric standards for the treatment of DDT and the other contaminants of concern in soils and sediments at this site, however, EPA and NJDEP have selected site-specific cleanup goals for soils. Each of the active alternatives will attain these cleanup goals. Soils and sediments at this site, as well as residuals from treatment alternatives, are not considered listed waste as defined by RCRA, but may be considered a RCRA-characteristic waste based upon heavy metals content. It is anticipated that the treated soils and sediments resulting from Alternative 4 or 5 would be returned to the excavated area and that a vegetative cover would be placed over them. However, the treated material would be tested prior to returning it to the excavated area to ensure compliance with New Jersey Solid Waste Regulations and LDRs for a RCRA-characteristic waste. Waivers from ARARs are not anticipated for any of the active cleanup options. If the selected treatment technology cannot meet the LDR standards for characteristic wastes, a treatability variance may be required.

Location-specific ARARs - Alternatives 2, 3, 4, 5, and 6 involve construction within regulated land areas. As result, all construction activities would have to comply with the Wetlands Protection Act and the Floodplain Management Act. Excavation of the wetlands area would require the preparation of a wetlands assessment to ensure appropriate restoration of this area. To ensure compliance with the National Historic Preservation Act, a site-wide cultural resources survey will be prepared during remedial design.

Action-specific ARARs - Implementation of Alternatives 3, 4, 5, and 6 must be in compliance with State and Federal ARARs governing the excavation, on-site treatment or off-site treatment and/or disposal of CERCLA soils and sediments. Based on SARA, off-site disposal (Alternative 3) is the least preferred alternative where practicable treatment technologies are available.

- Ground Water Remediation Alternatives

Chemical-specific ARARs - This is an interim remedy for the bedrock water-bearing zone. Alternatives 10, 11 and 12 would meet the treatment requirements for returning treated water to the ground water, and may meet NJDEP's requirements for discharge of water to Cakepoulin Creek. The ground water extraction and treatment alternatives may also meet ARARs for restoration of the ground water at some time in the future, but it is presently not possible to predict whether or not contaminant concentrations in the bedrock will remain above ARARs after implementation of a remedy.

However, it is anticipated that remediating the shallow ground water and initiating an interim extraction and treatment remedy for the bedrock ground water may result in limiting contamination to areas already impacted. The bedrock water-bearing zone would be periodically monitored until the start of the remedial action, as well as during the remedial action, and the data collected would be used to evaluate a final remedy for the ground water, to be established after an estimated period of five years. Waivers from ARARs are not anticipated for any of the active cleanup options.

The applicable requirements under Federal and State environmental laws for ground water treatment and discharge at the site are the maximum contaminant levels of the Federal and State Safe Drinking Water Acts. Cakepoulin Creek would be monitored before and during implementation of ground water remediation to assure that the treatment system effluent is not causing the creek to exceed Federal and State ARARs.

Location-specific ARARs - Alternatives 10, 11, and 12 may involve construction within regulated land areas. As a result, all construction activities would have to comply with the Wetlands Protection Act and the Floodplain Management Act. In addition, extraction or diversion of ground water from the wetlands would have to comply with the Wetlands Protection Act.

Action-specific ARARs - Implementation of Alternatives 10, 11, and 12 must be in compliance with State and Federal ARARs governing the construction of the extraction/treatment/discharge systems and the off-site treatment and/or disposal of waste streams (e.g., spent activated carbon and other residuals resulting from treatment).

- Building Remediation Alternatives

Chemical-specific ARARs - Currently, there are no Federal or State ARARs establishing acceptable site-related contaminant levels in buildings. Hazardous materials generated during the implementation of Alternative 15 (Decontamination) and Alternative 16 (Dismantlement) would need to meet applicable RCRA requirements for disposal. LDRs would not be ARARs for the dismantled building material in Alternative 16, however, testing prior to off-site disposal would determine the need for treatment prior to disposal.

Location-specific ARARs - Alternatives 15 and 16 may involve construction within regulated land areas. As a result, all construction activities would have to comply with the Wetlands Protection Act and the Floodplain Management Act.

A Stage 1A cultural resources survey has been prepared for the buildings on the site. The former mill structure was identified as being of potential cultural significance in the area. To ensure compliance with the National Historic Preservation Act, a site-wide cultural resources survey will be prepared during remedial design.

Action-specific ARARs - Implementation of Alternatives 15 and 16 must be in compliance with State and Federal ARARs governing the generation and off-site disposal of contaminated debris. Only Alternative 15 meets the recommendations of the National Historic Preservation Act, such that buildings that may qualify for inclusion in the National Register of Historic Places are preserved.

Long-Term Effectiveness and Permanence

- Soils and Sediments Remediation Alternatives

Implementation of Alternatives 3, 4, 5, and 6 would result in minimal risks remaining at the site. Alternatives 5 and 6 would destroy most of the hazardous organic contaminants on site through treatment. Alternative 5 would extract inorganic compounds from the treated soils and sediments before returning them to the site. Alternative 6 would destroy the organic contaminants through thermal treatment, prior to returning the soils to the site, with stabilization of the treated soil as warranted by inorganic chemical concentrations. Alternative 4 would not reduce the inherent hazards posed by the organic contaminants to the extent that Alternatives 5 and 6 would, since under Alternative 4 the organic contaminants are concentrated but not chemically destroyed. Alternative 3 simply transfers the contamination from the site to the designated disposal facility.

- Ground Water Remediation Alternatives

Alternatives 8 and 9 are not effective in the long term and are not permanent. Under Alternatives 8 and 9, the uncontrolled migration of ground water contaminants would continue. Alternatives 10, 11, and 12 should be effective for the remediation of the shallow water-bearing zone in the long term. In addition, these alternatives will control and reduce the contaminants migrating from the site in the bedrock water-bearing zone, and should maintain their effectiveness for the expected duration of the interim remedial action.

The potential for residual risk remaining at the site after completion of a remedial action cannot be fully assessed at this time. The implementation of an interim extraction and treatment remedy provides the best opportunity for assessing final ground water remedies in the bedrock water-bearing zone.

- Building Remediation Alternatives

Implementation of Alternative 15 or 16 would result in minimal risks remaining at the site. Building dust contamination would be removed.

Reduction of Toxicity, Mobility, or Volume Through Treatment

- Soils and Sediments Remediation Alternatives

Alternatives 4, 5, and 6 utilize treatment to address contaminated soil, and satisfy SARA's preference for the application of innovative technologies as remedies at Superfund sites. In each case, toxicity, mobility, and volume of soil contaminants would be reduced. Alternative 5 would be irreversible for organic and inorganic contaminants, to the extent that treated soil could be returned to the site. Alternative 6 would achieve similar reduction in toxicity, mobility, and volume for organic contaminants through thermal treatment, however, stabilized soil would retain inorganic contaminants. Neither Alternative 3, nor Alternative 4 destroys organic contaminants.

- Ground Water Remediation Alternatives

Alternatives 10, 11, and 12 would result in reductions in toxicity, mobility, and volume of contaminants in the ground water. The recovery of ground water for treatment may effect a reduction in contaminant mobility by preventing further migration of the contaminants. The toxicity and volume of contaminants in the ground water would be reduced via treatment, although the extent of overall toxicity and volume reduction would depend on the success of the interim remedy at extracting contaminated ground water. The treatment provided under these alternatives would be irreversible.

- Building Remediation Alternatives

Alternative 15 would achieve reduction in toxicity, mobility, and volume of contaminants, and is an irreversible process that satisfies SARA's preference for treatment. Alternative 16 would result in the generation of a large volume of contaminated building debris which may require treatment prior to disposal at a hazardous waste landfill off site.

Short-Term Effectiveness

- Soils and Sediments Remediation Alternatives

For the active alternatives, the time required for implementation is in the same range, from about one to three years. It is estimated that Alternative 5 would take two years to implement after the completion of the remedial design.

Short-term impacts resulting from the implementation of all the active alternatives can be minimized by appropriate monitoring and engineering controls. In addition, the wetland area will be impacted in the short term by any of the active soil treatment alternatives. This short-term impact will be mitigated, to the extent practicable, through wetlands restoration subsequent to remedial action.

Alternative 6 presents a slight increase in risk from emissions; however, these can be minimized through careful management of the thermal treatment unit.

- Ground Water Remediation Alternatives

Alternatives 10, 11, and 12 would begin to be effective at the onset of the extraction and treatment of the contaminated ground water. An assessment would need to be made during the design activities and throughout the remedial action to ensure that any adverse impacts to wetland areas would be mitigated. Treated water would be monitored prior to its discharge to ensure the effectiveness of the treatment system.

For the three extraction and treatment alternatives, the duration of remedial activities cannot be estimated until an interim remedy is in place and operating for a number of years. A five-year period of remediation prior to reevaluation of the interim remedy has been used for cost estimation purposes. It is estimated that construction for the extraction and treatment remedy would take one year.

Short-term risks to the community and workers during implementation of ground water remedial measures would be minimal, resulting from the transport of residuals off the site for disposal or further treatment (e.g., metals-containing sludge and spent granular activated carbon). All of the discharge alternatives should cause minimal short-term effects on human health and the environment.

• Building Remediation Alternatives

Of the active alternatives, Alternative 15 would take the least amount of time to implement, approximately six months. Alternative 16 offers the highest potential for increased risk resulting from emissions generated during dismantlement.

Implementability

• Soils and Sediments Remediation Alternatives

There is sufficient area on site for construction of any of the active treatment systems, however, it may be necessary to temporarily operate part of the treatment processes on adjacent, uncontaminated properties (particularly for Alternative 6). The alternatives have few associated administrative difficulties which could delay implementation. Alternative 5 involves innovative technologies and there is at present only one treatment unit available for this type of treatment. However, the techniques employed by these technologies are well established chemical engineering methods (e.g., mixing, drying, controlling chemical reactions) and the chemical reagents required are readily available.

While the technologies evaluated in Alternative 5 demonstrated their effectiveness at destroying the chlorinated organic compounds identified in site soil, some uncertainty remains as to the potential process reagents or treatment residuals that may be left in the treated soils when returned to the site. Pilot testing, to be performed during remedial design, would incorporate toxicity testing of the treated soils as an integral part of the process development. In addition, TCLP leachate testing would be performed on the treated soils to determine whether the soils can be placed on site without elevated risk to human health and the environment, and whether some soil washing techniques may be required.

In the unlikely event that the toxicity evaluation of treated soils during remedial design fails to demonstrate that they can be safely replaced on site, an alternative soils remedy would need to be considered, subject to additional public review and comment. Similar considerations would also apply to Alternative 4. The only fully demonstrated treatment alternative available at this time for this soil is thermal treatment.

• Ground Water Remediation Alternatives

There is sufficient area on site for construction of any of the extraction, treatment, and discharge systems evaluated, however, it may be necessary to locate infiltration galleries in uncontaminated areas near the site (e.g., in the wetland). Extraction and treatment systems are easily designed and constructed. The treatment units described in Alternatives 10, 11, and 12 are readily available, and can be easily operated and maintained.

Treatment system variables would be monitored carefully. Improvements in the extraction system could be implemented during the estimated five years of this interim remedy, as information on the effectiveness of the operation becomes available. The technology for constructing and operating infiltration galleries is well known, and discharge of treated water should be fully implementable. The presence of iron concentrations in the ground water could promote the scaling and clogging of the discharge system. An aggressive maintenance program may be necessary for the infiltration galleries to operate continually. Due to the uncertainties of the hydrogeological setting, the reinjection alternatives may be somewhat less reliable than the surface-discharge alternatives. As a result, the reinjection alternatives may require a pilot study and development of a three-dimensional model to confirm the effectiveness of these alternatives prior to or during design. Discharge to surface water is technically easier to implement than ground water reinjection or infiltration; however, the administrative difficulties of discharging to a trout stream make ground water discharge the more viable option.

- Building Remediation Alternatives

All alternatives developed are implementable and employ normal construction techniques.

Cost

- Soils and Sediments Remediation Alternatives

The estimated present worth for the remedial alternatives are:

- Alternative 1: $ 716,000
- Alternative 2: $ 752,000
- Alternative 3: $31,600,000
- Alternative 4: $26,128,000
- Alternative 5: $26,308,000 (based on APEG)
- Alternative 6: $31,472,000

The primary cost constituents of Alternatives 1 and 2 are sample collection and analysis. Alternative 3 costs are primarily attributed to off-site disposal, with 50 percent of the costs associated with transportation and landfill costs. Approximately 50 percent of the costs of Alternatives 4, 5, and 6 are directly associated with the soils treatment unit operation and maintenance. The remaining costs are attributed to construction of treatment units, excavation and placement of soils, sampling, and other typical remedial action costs.

- Ground Water Remediation Alternatives

The estimated present worth for the remedial alternatives are:

- Alternative 8: $ 2,140,000
- Alternative 9: $ 4,277,000
- Alternative 10: $18,397,000
- Alternative 11: $23,960,000
- Alternative 12: $19,268,000

The primary cost constituents of Alternatives 8 and 9 are sample collection and analysis. Costs of Alternatives 10, 11, and 12 are primarily attributed to ground water treatment, sampling, and analysis.

- Building Remediation Alternatives

The estimated present worth for the remedial alternatives are:

- Alternative 13: $ 19,000
- Alternative 14: $ 132,000
- Alternative 15: $ 1,213,000
- Alternative 16: $ 2,596,000

The primary cost constituents of Alternatives 13 and 14 are sample collection and analysis, and site security. Approximately 50 percent of the cost of Alternative 15 is labor, sampling, and analysis. Approximately 50 percent of the cost of Alternative 16 is off-site disposal.

State Acceptance

The State of New Jersey, while concurring with the selected remedy, has raised some concerns with the selection of ARARs for discharge of treated ground water and the ultimate cleanup goals for the remedy. These concerns are largely related to application of GW-2 "to-be-considered" ("TBC") discharge requirements developed by NJDEP for the point of discharge. EPA has, in this document, utilized promulgated ARARs in selecting the remedy. The appropriateness of NJDEP's "TBC" requirements and the impact on treatment requirements will be resolved during the remedial design.

In addition, the State of New Jersey has raised concerns regarding the impact of the selected ARARs upon the FW-1 standards which it has applied to the adjacent Cakepoulin Creek. EPA also acknowledges this concern and will evaluate the need for further action as part of design and post implementation monitoring efforts.

Community Acceptance

The objective of the community relations activities was to inform the public about the work being performed at the site and to seek input from the public on the remedy. Issues raised at the public meeting and during the pubic comment period are addressed in the Responsiveness Summary section of this ROD.

Selected Remedy

Section 121(b) of CERCLA, as amended, requires EPA to select remedial actions which utilize permanent solutions and alternative treatment technologies or resource recovery options to the maximum extent practicable. In addition, EPA prefers remedial actions that permanently and significantly reduce the mobility, toxicity, or volume of site wastes.

After careful review and evaluation of the alternatives considered in detail in the FS, EPA presented Alternative 5 for soils and sediments (excavation, on-site chemical dechlorination, backfilling treated soils), Alternative 10 for ground water (shallow and bedrock ground water extraction, physical treatment, discharge), and Alternative 15 for buildings (decontamination) to the public as the preferred remedy for the Myers Property site. The input received during the public comment period, consisting primarily of questions and statements submitted at the public meeting held on July 24, 1990, and comments from Atochem North America, Inc., is presented in the attached Responsiveness Summary. Public comments received encompassed a range of issues but did not necessitate any changes in the preferred alternatives for the site. Accordingly, the preferred alternatives were selected by EPA as the remedial solution for the site. The selected remedy is technically implementable; will permanently reduce the toxicity, mobility and volume of contaminants; is cost-effective; and will be protective of human health and the environment. The selected remedy provides the best balance of trade-offs among the alternatives with respect to the criteria that EPA uses to evaluate alternatives.

The ground water remedial alternative calls for the design and implementation of interim response measures which protect human health and the environment. The goal of this remedial action is to initiate contaminant removal and to collect data on aquifer and contaminant response to remediation measures. The ultimate goal of remediation is to return the ground water to its beneficial uses, in this case, as a drinking water source. However, EPA recognizes that the selected remedy may not achieve this goal because of the technical difficulties associated with removing contaminants to ground water cleanup goals. The interim remedial action will be monitored carefully to determine the feasibility of achieving this goal with this method, and modified, as appropriate. A final remedy for ground water will be selected after collecting additional information on the extent of ground water contamination, and evaluating the effectiveness of the interim remedy.

The remedy also includes periodic monitoring of private wells. If the wells become contaminated or threatened by site-related contaminants in the future, point-of-use treatment will be provided.

Some additional activities will be performed during the remedial design and remedial action phases for the site. These activities are described below.

On-site residents may have to be temporarily relocated. The portions of the remedial action which will necessitate relocation will be determined during the remedial design phase of the project. EPA will consult with other agencies on this task, such as ATSDR.

Further treatability studies and pilot plant studies will be used to select the optimal dechlorination process for the selected remedy for soils.

There will be additional sampling of the soil on site, particularly in the wetlands, to verify the extent of excavation required.

Should a continuous source of ground water contamination, (such as soils located below the water table that may be highly contaminated with VOCs) be identified during remedial design, additional remedial measures below the water table would be implemented (e.g., additional excavation and treatment).

Perimeter environmental monitoring throughout the remedial action will be performed. This monitoring program will minimize the potential of off-site impacts. The program will include effluent monitoring to assure compliance with discharge ARARs.

A wetland delineation and functional assessment will be performed. This information will be used to minimize adverse impacts on wetland areas and to determine the scope of the wetland restoration after remediation. This will include the evaluation of the potential negative impact that a temporary shallow ground water barrier may have on the uncontaminated wetland areas, and the development of appropriate measures to mitigate any potential environmental damage. A wetland restoration plan will also be developed.

Appropriate monitoring will be performed on the wetland areas both during and after remedial action. This will include an assessment of the effectiveness of the wetland restoration, and the need for additional restoration activities.

The soil treatment process may destroy the capacity of the soil to function in a wetland environment. Therefore, soil suitable for supporting a similar wetland environment may need to be brought in from off-site areas to replace some of the treated soil during the wetland remediation.

An assessment will be made to delineate the boundary of the 500-year floodplain in the area affected by the remedial action (c.f., Executive Order 11988).

Following completion of the remedial action for soils, sediments, and buildings, all on-site and off-site areas affected by the action will be recontoured, restored and revegetated to as close to their original conditions as possible.

The shallow and bedrock water-bearing zones, along with nearby potable wells, will be periodically monitored during the remedial design and remedial action phases as well as following the completion of the remedial action.

A permit equivalency process for the discharge of the treated water will be performed.

Cakepoulin Creek would be monitored before and during implementation of ground water remediation to assure that the treatment system effluent is not causing the creek to exceed Federal and State ARARs.

A Stage 1B and Stage 2 cultural resources survey will be prepared to ensure compliance with the National Historic Preservation Act.

Soil samples will be taken at varying depths from under the buildings remaining on site during remedial design. If the soil investigation results show that there is contamination beneath these structures, the selected remedy may need to include the areas occupied by these structures.

Statutory Determinations

Superfund remedy selection is based on SARA and, to the extent practicable, the NCP. EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of human health and the environment. Additionally, several other statutory requirements and preferences have been established. These specify that, when complete, the selected remedy must comply with ARARs, unless a statutory waiver is justified. The remedy must also be cost-effective and utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Finally, there is a preference for remedies which employ treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous wastes as their principal element. The following sections discuss how the remedy selected for the Myers Property site meets these requirements and preferences.

Protection of Human Health and the Environment

The selected remedy protects human health and the environment through the excavation, on-site chemical dechlorination of organic-contaminated soil, inorganics removal, and on-site backfilling of treated soil; the extraction of shallow and bedrock ground water, on-site physical treatment, and discharge of the treated ground water; and decontamination of on-site buildings. The selected remedy will achieve substantial risk reduction through treatment of contaminated soils, sediments, and ground water, all of which contribute to an increased health and environmental risk posed by the site.

On-site chemical dechlorination will eliminate the threat of exposure from direct contact to carcinogens. The current risks associated with these carcinogens, under the conditions and assumptions of the plausible maximum exposure scenario for lifetime residents on site, is $1x10^{3}$ (one in a thousand). By treating the organic-contaminated soil on site, the cancer risk will be reduced to an acceptable exposure level of 10^{-6} (one in a million). Washing the soil to remove inorganic contaminants effectively eliminates the potential health risk contributed by these soil constituents.

Extraction and treatment of shallow groundwater will significantly reduce the threat of exposure to ground water contamination. If unremediated, the future carcinogenic risk associated with this pathway is $4x10^{-1}$ (four in ten). Therefore, cleanup is warranted. In addition, shallow and bedrock ground water extraction may decrease the potential for migration of contaminants from the already contaminated sections of the water-bearing zones. It is uncertain whether the bedrock water-bearing zone can be fully remediated. Therefore, the selected remedy is an interim remedy to determine the potential for bedrock aquifer remediation. The ultimate cleanup objective of the bedrock water-bearing zone is to achieve health-based goals.

There are no short-term threats associated with the selected remedy which cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the remedy.

Compliance with ARARs

The selected remedy will comply with all applicable or relevant and appropriate action-, chemical-, and location-specific requirements. The ARARs are presented below.

Action-Specific

No RCRA action-specific ARARs are triggered by the remedy, since the waste is not a RCRA waste. Therefore, the RCRA LDRs do not apply.

Treatment unit discharges will conform to the provisions of the Clean Air Act. This will be accomplished through the installation of appropriate air pollution control equipment. Occupational Safety and Health Administration requirements will be complied with during implementation of the remedial action. EPA will conduct a permit equivalency process to fulfill the requirements of promulgated NJDEP air pollution regulations.

Chemical-Specific

There are no chemical-specific ARARs established for contaminants of concern at the Myers Property site for the remediation of contaminated soil, however, EPA and NJDEP have developed cleanup goals for the soils and sediments at the site. Soil containing contaminant concentrations above the cleanup objectives will be excavated and treated to achieve the cleanup goals. Organic contaminants will be destroyed by chemical dechlorination. Metals-contaminated soil will be treated on site prior to backfilling. The treated soil will also be tested for leachability prior to backfilling.

Ground water will be treated to the cleanup goals prior to discharge. Buildings will be decontaminated to achieve the cleanup objectives for soil.

Location-Specific

The site is not within the coastal zone as defined by the State of New Jersey. However, it is within a State-designated wetland. Therefore, a wetlands assessment will be performed to assess potential impacts. All wetland areas affected by remedial actions will be restored to their original conditions. The restoration will be in compliance with the Wetlands Protection Act.

The project area may be sensitive for the discovery of cultural resources. Therefore, as discussed earlier, a more extensive cultural resources survey will be prepared. Additional evaluation will be conducted to determine whether on-site buildings are subject to consideration as cultural resources, and actions will be taken to satisfy applicable provisions of the National Historic Preservation Act, where practicable.

All discharges to the surface water or ground water will be monitored in accordance with NJDEP requirements. Discharge Monitoring Reports will be submitted to NJDEP on a regular basis.

All off-site activities will comply with the joint RCRA/CERCLA off-site policy.

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

EPA and the State of New Jersey have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the Myers Property site. Of the alternatives that are protective of human health and the environment, and comply with ARARs, EPA and the State have determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term effectiveness, implementability, cost, and State and community acceptance.

Alternatives 5, 10, and 15 reduce the toxicity, mobility, and volume of contaminants in their respective media; comply with ARARs; provide both short- and long-term effectiveness; and protect human health and the environment. Therefore, the selected remedy is determined to be the most appropriate solution for the Myers Property site.

The State of New Jersey, while concurring with the selected remedy, has raised some concerns with the selection of ARARs for discharge of treated ground water and the ultimate cleanup goals for the remedy. These concerns are largely related to application of GW-2 "to-be-considered" ("TBC") discharge requirements developed by NJDEP for the point of discharge. EPA has, in this document, utilized promulgated ARARs in selecting the remedy. The appropriateness of NJDEP's "TBC" requirements and the impact on treatment requirements will be resolved during the remedial design.

In addition, the State of New Jersey has raised concerns regarding the impact of the selected ARARs upon the FW-1 standards which it has applied to the adjacent Cakepoulin Creek. EPA also acknowledges this concern and will evaluate the need for further action as part of design and post implementation monitoring efforts.

The Proposed Plan for the Myers site was released for public comment on July 13, 1990. The Proposed Plan identified Alternatives 5, 10, and 15 as the preferred alternatives. EPA reviewed all written and verbal comments submitted during the public comment period. Upon review of those comments, it was determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.

Cost-Effectiveness

The selected alternatives are determined to be cost-effective because they provide the highest degree of protectiveness among the alternatives evaluated, while representing cost value. There is little variance in cost between active remediation alternatives for the three media of concern. Table 16 presents a detailed cost evaluation of the selected remedy.

Both Alternatives 4 and 5 effectively address the threats posed by the soils and sediments contamination at the site for relatively close costs. However, the selected alternative affords a higher level of overall effectiveness proportional to its cost, through destruction of organic contaminants. Alternatives 10 and 15 provide equal protection, within their respective media, at lower cost.

Preference for Treatment as a Principal Element

By treating organic- and inorganic-contaminated soil on site through the use of an innovative process, and by extracting and treating ground water, the selected remedy addresses the threats posed by the site through the use of treatment technologies. Therefore, the statutory preference for remedies that employ treatment as a principal element is satisfied.

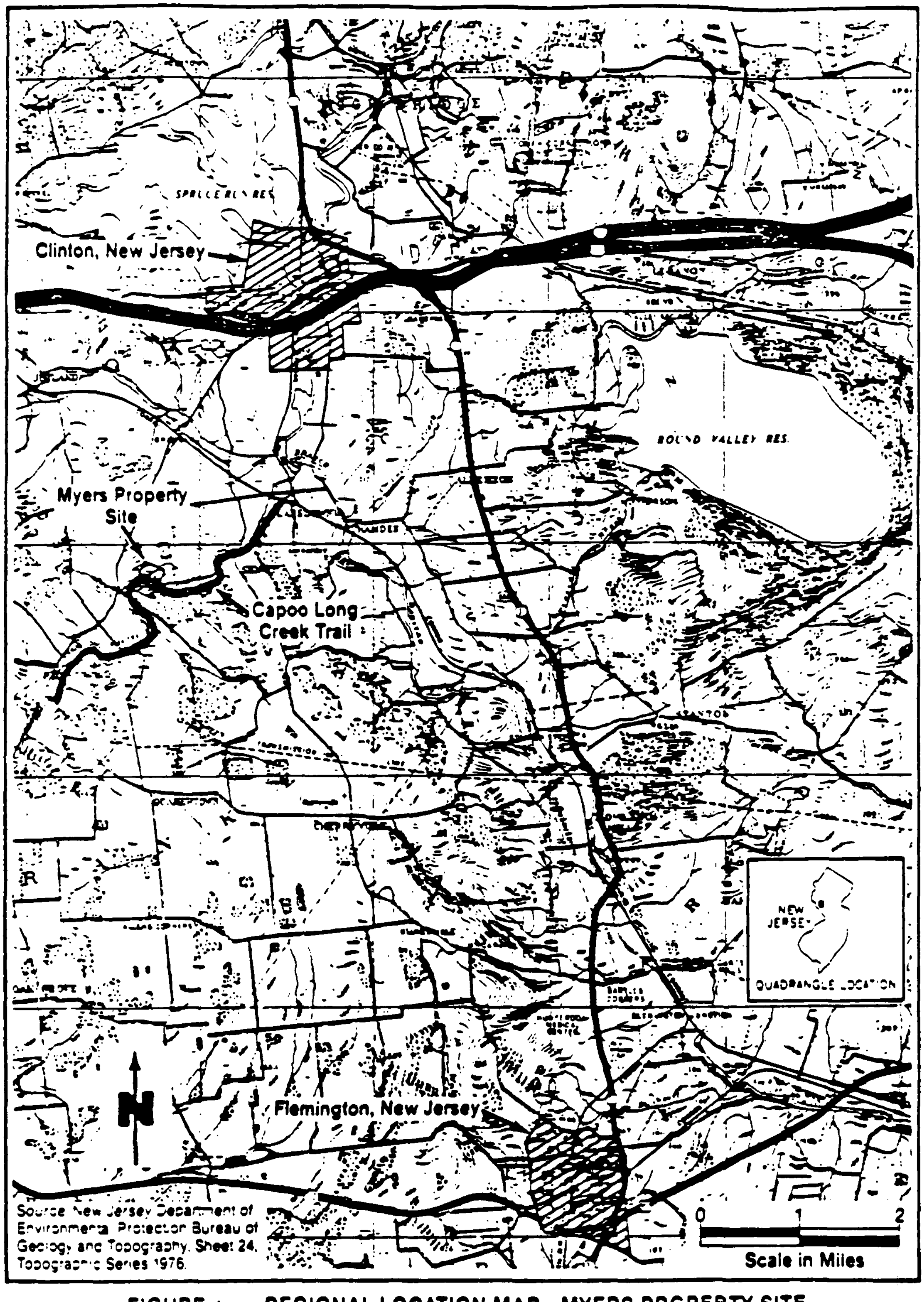

FIGURE 1 REGIONAL LOCATION MAP - MYERS PROPERTY SITE

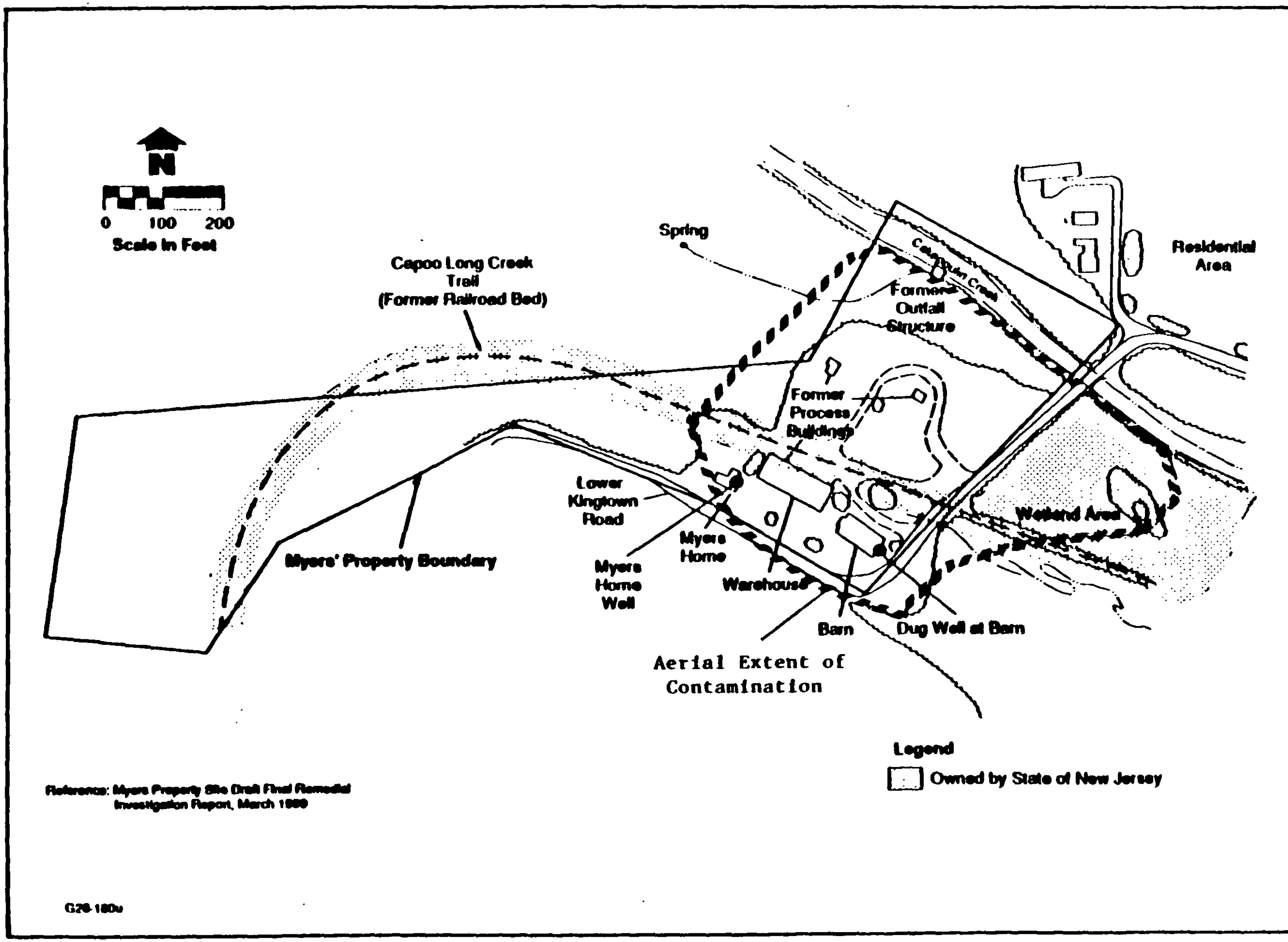

FIGURE 2 SITE DESCRIPTION OF MYERS PROPERTY SITE

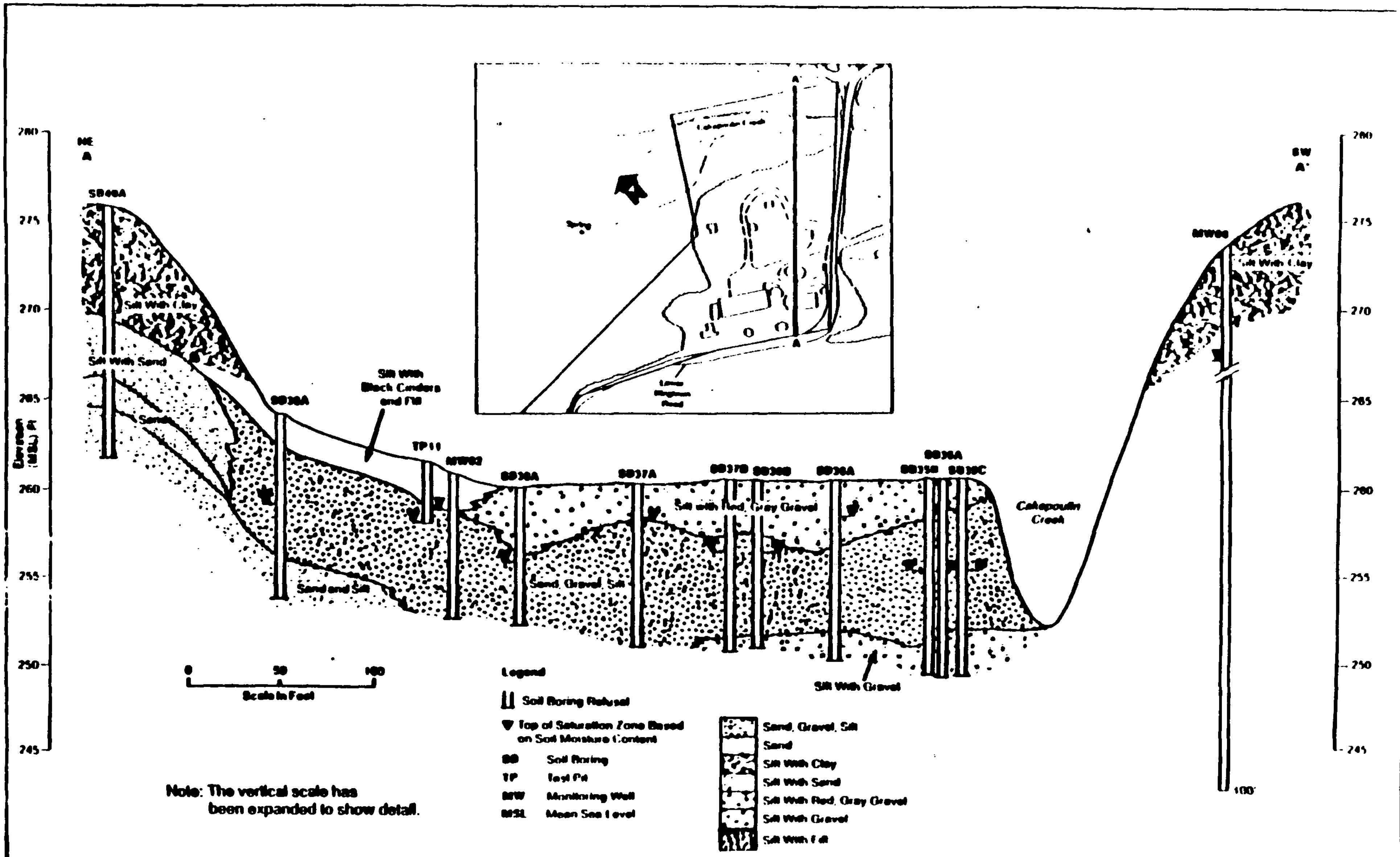

FIGURE 3 CROSS SECTION A-A′ OF ONSITE SOILS, MYERS PROPERTY SITE

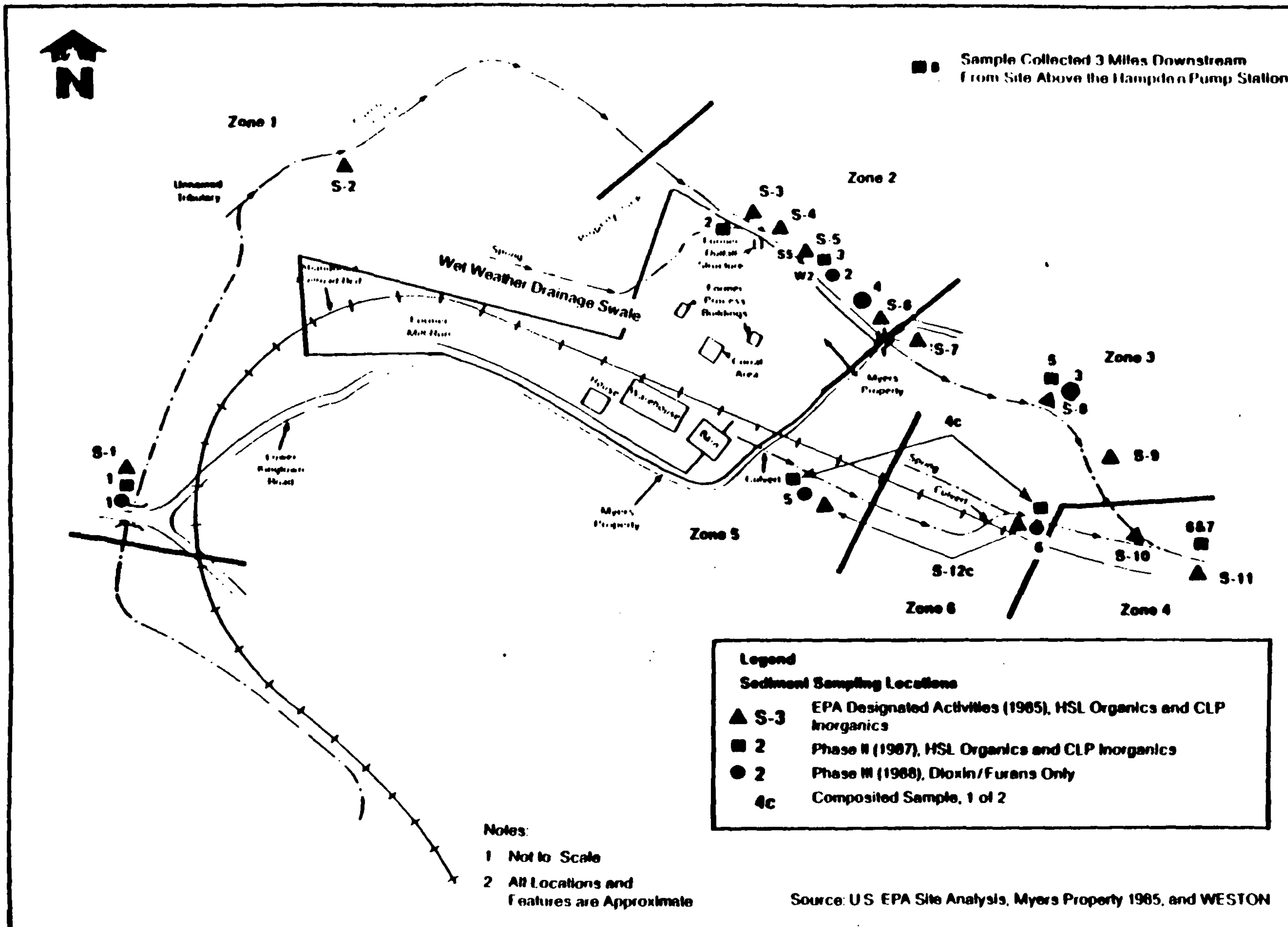

FIGURE 4 APPROXIMATE SEDIMENT SAMPLE LOCATIONS AT THE MYERS PROPERTY SITE

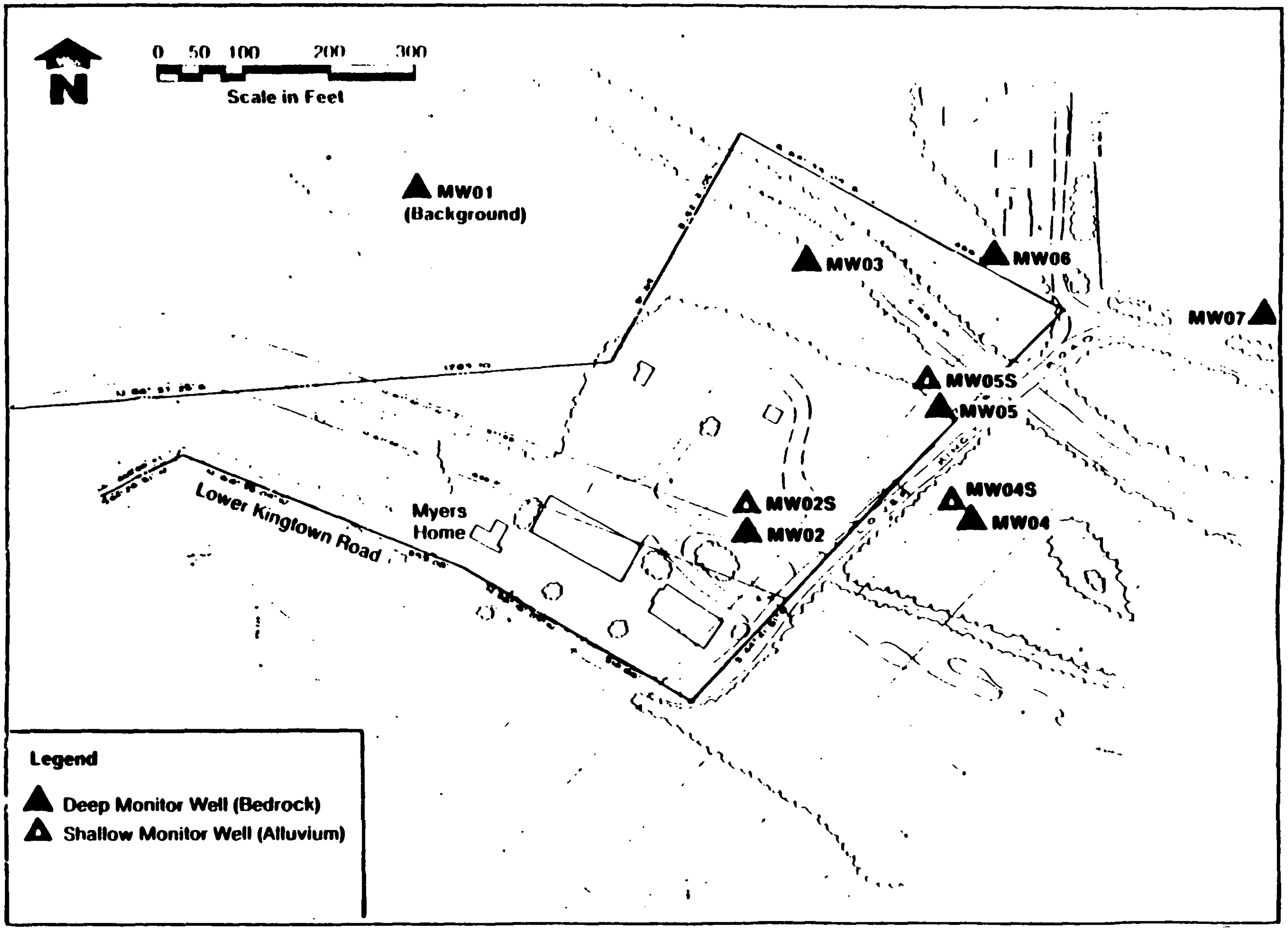

FIGURE 5 ONITORING WELL LOCATIONS
MYERS OPERTY SITE

TABLE 1

CHEMICALS OF POTENTIAL CONCERN DETECTED IN SURFACE SOIL SAMPLES FROM THE HOME/WAREHOUSE/BARN AREA AT THE MYERS PROPERTY SITE

Chemical	Frequency	Concentration Range (ug/kg)	Geometric Mean (ug/kg)	Maximum Background Concentration (ug/kg) [a]
Organics				

Carcinogenic PAHs				
Benzo(a)anthracene	2/9	<330-5,600	280	--
Benzo(b)fluoranthene	2/9	<330-8,300	246	
Chrysene	3/9	<330-7,400	297	--
Indeno(1,2,3-cd)pyrene	1/9	<330-3,700	233	
Benzo(a)pyrene	1/9	<330-4,400	238	
Total CPAHs	3/9	<330-29,565	1,564	--
DDT and Metabolites				
4,4-DDE	8/9	<16-33,000	1,269	--
4,4-DDD	1/9	<16-260	10	--
4,4-DDT	9/9	<16-300,000	26,588	--
Total DDT products	9/9	<16-300,016	31,036	--
2,3,7,8-TCDD	3/4	0.02-4.2	0.1	--
Endosulfan Sulfate	2/9	<16-780	22	--
Hexachlorobenzene	8/9	<330-55,000J	1,481	--
Non-carcinogenic PAHs				
Acenaphthylene	1/9	<330-3,200	229	
Anthracene	1/9	<330-2,100J	219	
Fluoranthene	3/9	<330-20,000	338	--
Phenanthrene	3/9	<330-15,000	342	--
Pyrene	3/9	<330-13,000	318	--
Napthalene	1/9	<330-6,900	250	
2-Methylnapthalene	1/9	<330-460J	185	
Benzo(g,h,i)perylene	1/9	<330-3,000	228	
Total NCPAHs	3/9	<330-63,660	2,317	--
Inorganics				

Aluminum	9/9	3,743,000-167,297,000	12,121,303	7,000,000
Antimony	1/9	<6,000-27,000J	9,452	10,000
Arsenic	9/9	7,000JR[c]-97,000	20,602	10,000
Barium	9/9	34,000-450,000	115,915	300,000
Cadmium	2/7	<500-3,500	438	--
Cyanide	2/9	<1,300-2,700R	109	--
Lead	8/9	<500-909,000	55,550	700,000
Silver	2/7	<1,000-4,400	1,178	--

-- = Information not available

a) Where available, background concentrations are from the site area in Hunterdon County, New Jersey (Shacklette and Boerngen 1984).

b) "J" designates estimated value

c) "R" indicates that spike sample recovery was not within control limits; concentration will be treated as an estimated value

TABLE 2

CHEMICALS OF POTENTIAL CONCERN DETECTED IN SURFACE SOIL SAMPLES FROM THE FLOOD PLAIN AREA AT THE MYERS PROPERTY SITE

Chemical	Frequency	Concentration Range (ug/kg)	Geometric Mean (ug/kg)	Maximum Background Concentration (ug/kg) [a]
Organics				
Carcinogenic PAHs				
Benzo(a)anthracene	8/30	<330-5,600	204	--
Benzo(b)fluoranthene	9/30	<330-8,300	216	--
Benzo(k)fluoranthene	5/30	<330-520	174	--
Chrysene	9/30	<330-7,400	209	--
Indeno(1,2,3-cd)pyrene	4/30	<330-3,700	161	--
Benzo(a)pyrene	7/30	<330-4,400	185	--
Total CPAHs	9/30	<330-29,565	1,197	--
DDT and Metabolites				
4,4-DDE	27/35	<16-133,000	909	--
4,4-DDD	3/35	<16-530,000	17	--
4,4-DDT	28/35	<16-5,470,000	14,086	--
Total DDT products	29/35	<16-6,133,000	20,344	--
1,2-Dichlorobenzene	2/30	<330-2,800	172	--
1,4-Dichlorobenzene	2/30	<330-1,700	167	--
2,3,7,8-TCDD	6/12	<0.057-6.74	0.20	--
Endosulfan Sulfate	2/35	<16-780	20	--
Heptachlor Epoxide	3/35	<8-2,900	12	--
Hexachlorobenzene	13/30	<330-25,000,000	1,209	--
Noncarcinogenic PAHs				
Acenapthylene	3/30	<330-3,200	159	--
Anthracene	5/30	<330-2,100	156	--
Fluoranthene	12/30	<330-20,000	250	--
Phenanthrene	9/30	<330-15,000	219	--
Pyrene	9/30	<330-13,000	271	--
Napthalene	3/30	<330-6,900	159	--
2-Methylnapthalene	2/30	<330-460	156	--
Benzo(g,h,i)perylene	4/30	<330-3,000	163	--
Total NCPAHs	12/30	<330-63,660	1,680	--
1,2,4-Trichlorobenzene	3/27	<330-4,300	169	--
Inorganics				
Aluminum	25/25	6,610,000-49,800,000	9,021,212	7,000,000
Antimony	7/25	<10,000-50,000J	9,274	10,000
Arsenic	23/25	<1,000-1,320,000	32,302	10,000
Cadmium	4/16	<500-5,100	416	--
Copper	25/25	19,000J-2,050,000	85,842	
Cyanide	5/25	<1,000-5,800R	652	
Lead	24/25	<500-364,000	62,821	700,000
Selenium	2/16	<500-6,500	359	
Silver	6/16	<1,000-6,200	1,138	

-- = Information not available

a) Where available, background concentrations are from the site area in Hunterdon County, New Jersey (Shacklette and Boerngen 1984).

b) "J" designates estimated value

c) "B" indicates that substance was also found in the laboratory blank, though at significantly higher levels to prove a positive detect.

d) NR = Not Reported. Chemical was detected infrequently, and the use of one-half of the CLP detection limit in calculating a geometric mean results in a mean concentration that exceeds the maximum reported cocncentration. Therefore, a mean will not be used.

TABLE 3

CHEMICALS OF POTENTIAL CONCERN DETECTED IN SURFACE SOIL SAMPLES FROM THE FIELD ACROSS LOWER KINGTOWN ROAD AT THE MYERS PROPERTY SITE

Chemical	Frequency	Concentration Range (ug/kg)	Geometric Mean (ug/kg)	Maximum Background Concentration (ug/kg) [a]
Organics				

Carcinogenic PAHs				
Benzo(a)anthracene	2/5	<330-332J	170	
Benzo(b)fluoranthene	3/5	<330-560	212	--
Benzo(k)fluoranthene	2/5	<330-248J	153	
Chrysene	3/5	<330-389	206	--
Indeno(1,2,3-cd)pyrene	1/5	<330-114J	NR	
Benzo(a)pyrene	3/5	<330-330J	175	--
Total CPAHs	3/5	<330-1,665	1,108	--
DDT and Metabolites				
4,4-DDE	11/13	<16-2,500,000	3,538	--
4,4-DDD	3/13	<16-7,600	33	--
4,4-DDT	13/13	<16-9,300,000	100,052	--
Total DDT products	13/13	<16-11,800,008	128,134	--
2,3,7,8-TCDD	2/2	0.2-0.06	0.035	--
Non-carcinogenic PAHs				
Acenaphthylene	1/5	<330-19J	NR	
Anthracene	3/5	<330-58J	NR	--
Fluoranthene	5/5	44J-865	328	--
Phenanthrene	4/5	<330-497J	135	--
Pyrene	5/5	37J-702J	252	--
2-Methylnapthalene	1/5	<330-338J	190	
Benzo(g,h,i)perylene	1/5	<330-128	NR	
Total NCPAHs	5/5	922-2,771	1,683	--
Inorganics				

Aluminum	10/10	7,538,000-18,100,000	11,434,631	7,000,000
Antimony	1/10	<6,000-58,000J	10,450	10,000
Arsenic	8/9	<1,000-176,000JR [d]	20,316	10,000
Cadmium	7/10	<500-4,200	1,371	--
Silver	5/10	<1,000-4,700	1,233	--

-- = Information not available

a) Where available, background concentrations are from the site area in Hunterdon County, New Jersey (Shacklette and Boerngen 1984).

b) "J" designates estimated value

c) NR = Not Reported. Chemical was detected infrequently, and the use of one-half of the CLP detection limit in calculating a geometric mean results in a mean concentration that exceeds the maximum reported concentration. Therefore, a mean will not be used.

d) "R" indicates that spike sample recovery was not within control limits; concentration will be treated as an estimated value

TABLE 4

CHEMICALS OF POTENTIAL CONCERN DETECTED IN SURFACE WATER AND SEDIMENT SAMPLES FROM CAKEPOULIN CREEK AT THE MYERS PROPERTY SITE

Chemical	Frequency	Concentration Range	Geometric Mean	Background Concentration Range
SURFACE WATER (ug/liter):				
Aluminum	4/6	<100-294J (a)	160	<200
SEDIMENT (ug/kg):				
Organics				
Carcinogenic PAHs				
Benzo(a)anthracene	5/14	<330-190J	161	<330-86J
Benzo(a)pyrene	5/14	<330-571J	174	<330
Benzo(b)fluoranthene	5/14	<330-250J	152	<330-81J
Benzo(k)fluoranthene	4/14	<330-250J	157	<330-81J
Chrysene	6/14	<330-240J	165	<330-50J
Total CPAHs	8/14	<330-1,231J	837	<330-463J
DDT and Metabolites				
4,4-DDE	2/14	<16-67	10.0	<16
4,4-DDD	1/14	<16-44	9.0	<16
4,4-DDT	2/13	<16-1,300	13.3	<16
Total DDT Products	2/14	<16-1,411	33.6	<16
Noncarcinogenic PAHs				
Phenanthrene	6/14	<330-280J	161	<330-169J
Pyrene	13/14	<330-455J	149	<330-273J
Fluoranthene	9/14	<330-320J	129	<330-77J
Total NCPAHs	13/14	<330-1,010J	467	<330-607J
Inorganics				
Aluminum	9/9	1,806-6,740	2,885	1,640-2,250
Barium	9/9	25-69	36	23-27
Cadmium	1/9	<0.5-2.4	0.32	<0.5
Chromium	9/9	7.1-25	12	6.4-9.2
Lead	9/9	5.8-21	8.7	5.2-27

(a) "J" designates estimated value.

TABLE 5

CHEMICALS OF POTENTIAL CONCERN DETECTED IN SURFACE WATER AND SEDIMENT SAMPLES FROM THE ONSITE SPRING AND DRAIN AREA AT THE MYERS SITE

Chemical	Frequency	Concentration Range	Geometric Mean	Background Concentration Range
SURFACE WATER (ug/liter):				
DDT and Metabolites				
DDE	2/2	0.01-0.1	0.03	<16
DDD	2/2	0.12-0.4	0.22	<16
DDT	2/2	0.04-0.35	0.12	<16
Total DDT Products	2/2	0.17-0.85	0.38	<48
Aluminum	2/4	<200-294	160	<200
Arsenic	3/4	<10-15	10	<10
Manganese	4/4	41-322	107	6.6-24
SEDIMENT (ug/kg):				
Organics				
Benzoic acid	1/3	<330-72J [a]	125	<330
Carcinogenic PAHs				
Chrysene	1/3	<330-200J	176	<330-50J
Benzo(a)pyrene	1/3	<330-160J	163	<330
Benzo(a)anthracene	1/3	<330-200J	176	<330-86J
Total CPAHs	1/3	<330-560	516	<330-463J
Chlorobenzene	2/3	<5-101	14	<5
DDT and Metabolites				
4,4-DDD	1/3	<16-1,600	47	<16
4,4-DDT	3/3	120-8,800	2,078	<16
Total DDT Products	3/3	128-10,100	2,250	<16
1,2-dichlorobenzene	1/3	<330-280J	197	<330
1,3-dichlorobenzene	1/3	<330-120J	148	<330
1,4-dichlorobenzene	1/3	<330-700J	267	<330
Dioxins and Dibenzofurans				
Total TCDD	2/2	10.4J-28.3J	17	ND [b]
Total OCDD	1/2	ND-31	NA [c]	ND
Total TCDF	2/2	9.68-30.2J	17	ND
Total PeCDF	2/2	39.2-116J	67	ND
Total HxCDF	2/2	43.1-53	48	ND
Total HpCDF	2/2	86.2-106.9	96	ND
Total OCDF	2/2	55.3-186.5	102	ND
Hexachlorobenzene	1/3	<330-680J	265	<330
Noncarcinogenic PAHs				
Pyrene	1/3	<330-370J	216	<330-273J
Fluoranthene	1/3	<330-350J	212	<330-77J
Phenanthracene	1/3	<330-150J	160	<330
Total NCPAHs	1/3	<330-870J	597	<330-607J
Toluene	1/3	<5-22	5.2	<5
1,2,4-trichlorobenzene	1/3	<330-190J	173	<330
Inorganics				
Arsenic	3/3	3.3-189	35	<1-6.1
Barium	3/3	28-126	59	23-53
Chromium	3/3	5.1-27	15	6.4-10.1
Lead	3/3	10-47	18	5.2-27
Sodium	1/1	2,120	--	<500-741

a) "J" designates estimated value

b) ND = Not Detected. EPA did not provide detection limits for the dioxin and dibenzofuran sediment samples.

c) NA = Not Applicable. Because EPA did not provide detection limits for dioxin and dibenzofuran sediment samples, geometric means using one-half of the detection limit for non-detects could not be calculated.

TABLE 6

CONCENTRATIONS OF CHEMICALS DETECTED IN FISH SAMPLES AT THE MYERS PROPERTY SITE

Chemical	Frequency [a]	Concentration Range [b] (ug/kg)	Geometric Mean (ug/kg)	Maximum Fish Conc. [c] (ug/kg)	Background Concentration Range [b] (ug/kg)	National Background Conc. [d] (ug/kg)
Edible fish [e]						
*DDT and Metabolites	4/4	264-614	381	1,740 [f]	277-316	290
Dieldrin	4/4	NR [g]	NR	11	<32	40
*Dioxins and Dibenzofurans						
2,3,7,8-TCDD	1/2	NA [h]	NA	7.72E-03 [i]	[j]	--
Other TCDD	1/2	NA	NA	1.58E-04	[j]	--
1,2,3,7,8-PeCDD	1/2	NA	NA	4.22E-02	[j]	--
1,2,3,4,7,8-HxCDD	1/2	NA	NA	2.60E-02	[j]	--
Other HxCDD	2/2	NA	NA	5.60E-02	[j]	--
1,2,3,4,6,7,8-HpCDD	2/2	NA	NA	5.90E-02	[j]	--
Other HpCDD	2/2	NA	NA	1.88E-03	[j]	--
2,3,7,8-TCDF	2/2	NA	NA	8.04E-03	[j]	--
Other TCDF	2/2	NA	NA	6.51E-03	[j]	--
1,2,3,7,8-PeCDF	2/2	NA	NA	4.17E-02	[j]	--
Other PeCDF	1/1	NA	NA	1.28E-03	[j]	--
1,2,3,4,7,8-HxCDF	2/2	NA	NA	3.54E-03	[j]	--
Other HxCDF	1/1	NA	NA	8.80E-04	[j]	--
1,2,3,4,6,7,8-HpCDD	2/2	NA	NA	8.08E-03	[j]	--
Other HpCDF	1/1	NA	NA	5.50E-04	[j]	--
Endrin	1/4	NR	NR	11	<32	<10
Forage fish [k]						
+DDT and Metabolites	4/4	307-553	347	1,300 [l]	277-316	290
Dieldrin	1/4	NR	NR	6	<32	40
+Dioxins and Dibenzofurans						
2,3,7,8-TCDD	1/2	NA	NA	1.27E-03	[j]	--
1,2,3,4,7,8-HxCDD	1/2	NA	NA	3.57E-04	[j]	--
Other HxCDD	1/2	NA	NA	4.60E-04	[j]	--
1,2,3,4,6,7,8-HpCDD	1/2	NA	NA	1.54E-03	[j]	--
Other HpCDD	1/2	NA	NA	3.68E-03	[j]	--
2,3,7,8-TCDF	2/2	NA	NA	2.84E-03	[j]	--
Other TCDF	2/2	NA	NA	2.49E-03	[j]	--
1,2,3,7,8-PeCDF	1/2	NA	NA	3.12E-03	[j]	--

* = Indicates chemicals selected as Chemicals of Potential Concern for both human and ecological risk assessments

+ = Indicates chemicals selected as Chemicals of Potential Concern for ecological risk assessment only

-- = Information is not available

a) Total number of locations at which chemical was detected in at least one species divided by total number of locations with nonrejected data.

b) Values in this range are arithmetic means of chemical concentrations across all species of fish analyzed from a specific location.

c) Maximum concentration found in an individual species at a single sampling location.

d) from Schmitt et al. (1985)

e) Edible fish sampled included american eel, bluegill, brook trout, brown trout, pumpkinseeds, rainbow trout, and white suckers.

f) Unless otherwise specified, maximum edible fish concentration was found in the American eel.

g) NR = Not Reported. Chemical was detected in frequently, and the use of one-half of the detection limit in calculating an arithmetic mean resulted in a mean concentration that exceeds the maximum reported concentration. Therefore, these averages will not be used.

h) Because EPA did not provide detection limits for all samples, an arithmetic mean across all species of fish analyzed from a specific location could not be calculated. This also prevented calculation of a geometric mean across all locations.

i) Maximum concentrations in dioxin samples were in white suckers, except for brown trout for 2,3,7,8-TCDF.

j) Because dioxin sampling occurred at only two locations, one being background, all samples will be combined and treated as site-related under the maximum case only.

k) Forage fish sampled included black-nosed and long-nosed dace, common and striped shiners, and fallfish.

l) Maximum forage fish concentration was found in the black-nosed dace for DDT and dieldrin. All forage fish dioxin samples are from fallfish.

TABLE 7

Summary of Major Contaminant Concentrations From the Ground Water Monitoring Wells at the Myers Property Site

Contaminants	Maximum detected concentration (µg/Liter)
Organic Compounds	
Benzene	60,000
Chlorobenzene (mono)	250,000
4,4'-DDT	270
4,4'-DDE	0.9
4,4'-DDD	8.3
1,2-dichlorobenzene	15,492
1,3-dichlorobenzene	293
1,4-dichlorobenzene	12,090
Total TCDD	0.073
Hexachlorobenzene	10.6
Heptachlor	0.124
Alpha BHC	2.4
Beta BHC	0.86
Delta BHC	0.24
Gamma BHC (Lindane)	0.8
Methoxychlor	10.6
Naphthalene	67
1,2,4-Trichlorobenzene	2,198
Inorganic Chemicals	
Aluminum	33,300
Antimony	6,110
Arsenic	9,710
Chromium	107
Iron	48,900
Lead	28
Manganese	10,100
Silver	139
Zinc	90

TABLE 8

CHEMICALS DETECTED IN RESIDENTIAL WELL GROUNDWATER SAMPLES
ON AND NEAR THE MYERS PROPERTY SITE [a]

Chemical	Frequency	Concentration Range (ug/liter)	Geometric Mean (ug/liter)	Background Concentration Range (ug/liter)	Typical Dissolved Concentration (ug/liter) [b]
Organics					
Di-n-butylphthalate	1/6	<10-3J	NR [c]	<10-5J [d]	
Inorganics					
Aluminum	1/6	<100-42	NR	<100-169	<100
Manganese	1/6	<10-12	6.0	<10-101	<100
Mercury	1/6	<0.2-0.3	0.12	<0.2	0.5 [e]
Zinc	5/5	20-414	55	11-45	<100

-- = Information was not available

a) No chemicals were selected as Chemicals of Potential Concern for residential groundwater. See Section 5.3.2.1 for further discussion.

b) Unless otherwise indicated, typical dissolved concentrations are from Freeze and Cherry (1979).

c) NR = Not Reported. Chemical was detected infrequently, and the use of one-half of the detection limit in calculating a geometric mean results in a mean concentration that exceeds the maximum reported cocnentration. Therefore, a mean will not be used.

d) "J" designates estimated value

e) EPA 1986a

TABLE 9

CHEMICALS OF POTENTIAL CONCERN DETECTED IN DUST SAMPLES IN THE HOUSE, WAREHOUSE, AND BARN AT THE MYERS SITE

Chemical	Frequency	Concentration Range (mg/kg)	Geometric Mean (mg/kg)
House			
DDT and Metabolites	6/7	0.13-29	4.1
Warehouse			
DDT and Metabolites	4/4	310-14,200	1,672
Barn			
DDT and Metabolites	4/4	310-2,900	1,017

TABLE 10

CHEMICALS OF POTENTIAL CONCERN AT THE MYERS PROPERTY SITE

SOILS

Home/Warehouse/Barn Area

Carcinogenic PAHs
DDT and Metabolites
2,3,7,8-TCDD
Endosulfan Sulfate
Hexachlorobenzene
Noncarcinogenic PAHs
Aluminum
Antimony
Arsenic
Barium
Cadmium
Cyanide
Lead
Silver

Flood Plain Area

Carcinogenic PAHs
DDT and Metabolites
1,2-dichlorobenzene
1,4-dichlorobenzene
2,3,7,8-TCDD
Endosulfan Sulfate
Heptachlor Epoxide
Hexachlorobenzene
Noncarcinogenic PAHs
1,2,4-trichlorobenzene
Aluminum
Antimony
Arsenic
Cadmium
Copper
Cyanide
Lead
Selenium
Silver

Field Across Lower Kingtown Road

Carcinogenic PAHs
DDT and Metabolites
2,3,7,8-TCDD
Noncarcinogenic PAHs
Aluminum
Antimony
Arsenic
Cadmium
Silver

GROUNDWATER

Monitoring Wells

Benzene
alpha, beta, delta, & gamma BHC
Chlorobenzene
DDT and Metabolites
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,2,4-trichlorobenzene
Dioxins and Dibenzofurans
Endosulfan II
Heptachlor
Heptachlor epoxide
Methoxychlor
Naphthalene
Aluminum
Antimony
Arsenic
Chromium
Iron
Lead
Manganese
Silver
Zinc

DUST

Myers House

DDT and Metabolites

Warehouse

DDT and Metabolites
Hexachlorobenzene

BIOTA

DDT and Metabolites
Dioxins and Dibenzofurans

SURFACE WATER

Cakepoulin Creek

Aluminum

Onsite Spring and Drain

DDT and Metabolites
Aluminum
Arsenic
Iron
Manganese

SEDIMENT

Cakepoulin Creek

Bis(2-ethylhexyl)phthalate
Carcinogenic PAHs
DDT and Metabolites
Di-n-butylphthalate
Noncarcinogenic PAHs
Aluminum
Barium
Cadmium
Chromium
Lead

Onsite Spring and Drain

Benzoic acid
Carcinogenic PAHs
Chlorobenzene
DDT and Metabolites
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
Di-n-butylphthalate
Dioxins and Dibenzofurans
Hexachlorobenzene
Noncarcinogenic PAHs
Toluene
1,2,4-trichlorobenzene
Arsenic
Sodium

TABLE 11

Health Effects Criteria for Chemicals of Potential Concern (a)
with Updates in Parentheses

Chemical	Reference Dose (RfD) (mg/kg/day) Oral	Reference Dose (RfD) (mg/kg/day) Inhalation	Cancer Potency Factor (mg/kg/day)-1 Oral	Cancer Potency Factor (mg/kg/day)-1 Inhalation	Weight of Evidence (b)
Aluminum	—	—	—	—	—
Antimony	4E-4	—	—	—	—
Arsenic	— (1E-3)	—	1.5 (1.7)	50.1 (5.0E+1)	A
Barium	5E-2	1.4E-4 (1E-4)	—	—	—
Benzene	—	—	5.2E-2(2.9E-2)	2.6E-2(2.9E-2)	A
Benzene Hexachloride (BHC)					
- alpha	—	—	6.3	6.3	B2
- beta	—	—	1.8	1.8	C
- delta	—	—	—	—	—
- gamma	3E-4	—	1.3	—	B2
Benzoic Acid	—(4E+0)	—	—	—	—
Bis (2 ethylhexyl)					
phthalate	(2E-2)	(—)	(1.4E-2)	(—)	(B2)
Cadmium	5E-4	—	—	6.1	B1
Chlorobenzene	2.7E-2(2E-2)	5.7E-3(5E-3)	—	—	—
Chloroform	1E-2	—	8.1E-2(6.1E-3)	8.1E-2	B2
Chromium VI	5E-3	—	—	41	A
Copper	3.7E-2	1E-2	—	—	—
Cyanides	2E-2	—	—	—	—
4,4-DDT/DDD/DDE	5E-4	—	3.4E-1	—(3.4E-1)	B2
1,2-Dichlorobenzene	8.9E-2	—(4E-2)	—	—	—
1,3-Dichlorobenzene	8.9E-2	—	—	—	—
1,4-Dichlorobenzene	1.E-1	—	2E-2(2.4E-2)	—	C
1,1-Dichloroethene	9E-3	—	6E-1	1.2	C
Endosulfan	5E-5	—	—	—	—
Heptachlor	5E-4	—	4.5	4.5	B2
Heptachlor Epoxide	1.3E-5	—	9.1	9.1	B2
Hexachlorobenzene	—(8E-4)	—	1.7	—(1.7)	B2
Iron	1	8.6E-3	—	—	C
Lead	6E-4(—)	—	—	—	B2
Manganese	2.2E-1(2E-1)	3E-4	—	—	—
Mercury (inorganic)	1.4E-3(3E-4)	—	—	—	—
Methoxychlor	5E-2	—	—	—	—
Polychlorinated					
Dibenzofurans (PCDFs)	(c)	(c) SEE ATTACHMENT	(c)	(c)	—
Polychlorinated Dibenzo-p					
dioxins (2,3,7,8-TCDD)	1E-9	—	1.56E+5	—	B2
Polycyclic Aromatic					
Hydrocarbons (PAHs)					
- Noncarcinogenic					
- (napthalene)	4.1E-1	—	—	—	—
- Carcinogenic					
- (Benzo(a)pyrene)	—	—	11.5	6.1	B2
Selenium	3E-3	1E-3	—	—	—
Silver	3E-3	—	—	—	—
Sodium	—	—	—	—	—
Toluene	3E-1	1.5(2E+0)	—	—	—
1,2,4-Trichlorobenzene	2E-2	—(3E-3)	—	—	—
Vanadium	5.7E-3(7E-3)	—	—	—	—
Zinc	2.1E-1	1E-2	—	—	—

a) References for each specific critical toxicity value are presented in the toxicity summaries of Section 1.3.3.

(b) EPA Weight of Evidence Categories for Potential Carcinogens: Group A (Human Carcinogen)—Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer; B1 (Probable Human Carcinogen)—Limited evidence of carcinogenicity in humans from epidemiologic studies; B2 (Probable Human Carcinogen)—Sufficient evidence of carcinogenicity in animals and inadequate evidence of carcinogenicity in humans; C (Possible Human Carcinogen)—Limited evidence of carcinogenicity in animals.

(c) Specific critical toxicity values, health criteria, and weight-of-evidence classifications for potential carcinogenicity have not been developed for the polychlorinated dibenzofurans (PCDFs). Instead, EPA has proposed a risk assessment approach for the PCDFs based on toxicity equivalency factors (TEFs). Under the TEF approach, each PCDF and its potency is characterized relative to that of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TDCC). The basis for this approach is the similarity in mechanisms of actions and toxic effects of the PCDFs to those of 2,3,7,8-TCDD and other polychlorinated dibenzo-p-dioxins. Consequently, the cancer potency factor and oral RfD developed for 2,3,7,8-TCDD can be used to evaluate the health risk associated with the various PCDFs.

Sources of Updates: U.S.EPA, 1989a; U.S. EPA 1989b; U.S.EPA 1989c.

TABLE 12

EXPOSURE PATHWAYS TO CHEMICALS ORIGINATING AT THE MYERS PROPERTY SITE

(Current Use Scenarios)

Exposure Medium	Receptors	Routes of Exposure	Pathway Complete?
Surface Soil	Children living in the house onsite	Incidental ingestion, Dermal absorption	Yes, to exposures in all three surface soil areas.
	Lifetime residents in the house onsite	Incidental ingestion, Dermal absorption	Yes, to exposures in home/warehouse/barn area.
	Trespassing children	Incidental ingestion, Dermal absorption	Yes, fence around flood plain will not adequately prevent trespassing children.
Air	Lifetime residents in the house onsite	Inhalation of wind-entrained particulate matter	Yes, to resuspended soils from bare areas in the flood plain.
Surface Water	Children living in the house onsite; trespassing children	Dermal absorption	Yes, to exposures in Cakepoulin Creek and the onsite spring and drain.
Sediment	Children living in the house onsite; trespassing children	Dermal absorption	Yes, to exposures in Cakepoulin Creek and the onsite spring and drain.
Groundwater	Lifetime residents in the house onsite and residents downgradient	Ingestion	No, resident wells do not presently show chemicals from site.
Dust	Lifetime residents in the house onsite	Incidental ingestion, Dermal absorption	Yes, to exposures in the house onsite.
Fish	Lifetime residents in the house onsite	Ingestion	Yes, for fish caught from Cakepoulin Creek.

(Future Use Scenarios)

Exposure Medium	Receptors	Routes of Exposure	Pathway Complete?
Surface Soil	Children living in a house on the flood plain or across Lower Kingtown Road	Incidental ingestion, Dermal absorption	Yes, to exposures on home property areas.
	Lifetime residents in a house on the flood plain or across Lower Kingtown Road	Incidental ingestion, Dermal absorption	Yes, to exposures on home property areas.
Air	Lifetime residents in a house on the flood plain or across Lower Kingtown Road	Inhalation of wind-entrained particulate matter	No, bare areas will have been developed.
Surface Water	Children living in a house across Lower Kingtown Road	Dermal absorption	Yes, to exposures in the onsite spring and drain.
Sediment	Children living in a house across Lower Kingtown Road	Dermal absorption	Yes, to exposures in the onsite spring and drain.
Groundwater	Lifetime residents in a house on the flood plain or across Lower Kingtown Road	Ingestion	Yes, to groundwater from beneath the site.
Dust	Lifetime residents in a house on the flood plain or across Lower Kingtown Road	Incidental ingestion, Dermal absorption	Yes, to exposures in homes.
Fish	Lifetime residents in a house on the flood plain or across Lower Kingtown Road	Ingestion	Yes, for fish caught from Cakepoulin Creek.

TABLE 13

SUMMARY OF RISKS

Exposure Scenario	Total Excess Cancer Risk: Average Case	Total Excess Cancer Risk: Plausible Maximum Case	Hazard Index: Average Case	Hazard Index: Plausible Maximum Case
<u>Current Use Scenarios</u>				
Direct Contact with Soil				
Onsite Children playing in				
Home/Warehouse/Barn Area	$5x10^{-6}$	$1x10^{-3}$	$7x10^{-2}$	$2x10^{+1}$
Flood Plain Area	$1x10^{-6}$	$9x10^{-3}$	$2x10^{-2}$	$9x10^{+0}$
Field Across Lower Kingtown Road	$7x10^{-7}$	$3x10^{-4}$	$8x10^{-3}$	$9x10^{+0}$
Lifetime Residents in Home/Warehouse/Barn Area	$7x10^{-6}$	$1x10^{-3}$	$3x10^{-2}$	$7x10^{+0}$
Children trespassing in Flood Plain Area	$1x10^{-6}$	$9x10^{-3}$	$2x10^{-2}$	$9x10^{+0}$
Inhalation of Particulate Matter				
Lifetime Residents Onsite	---	$1x10^{-6}$	---	$3x10^{-3}$
Direct Contact with Sediments				
Onsite Children playing in				
Cakepoulin Creek	$5x10^{-9}$	$5x10^{-7}$	$4x10^{-7}$	$4x10^{-4}$
Onsite Spring and Drain	$4x10^{-7}$	$4x10^{-5}$	$4x10^{+0}$	$4x10^{+2}$
Ingestion of Fish from Cakepoulin Creek				
Lifetime Residents	$4x10^{-5}$	$1x10^{-2}$	$3x10^{-1}$	$4x10^{+2}$
Direct Contact with Dust				
Onsite Children	$7x10^{-8}$	$2x10^{-6}$	$4x10^{-4}$	$1x10^{-2}$
Lifetime Residents Onsite	$7x10^{-8}$	$2x10^{-6}$	$4x10^{-4}$	$1x10^{-2}$
<u>Future Use Scenarios</u>				
Direct Contact with Soil				
Children playing in yard in				
Flood Plain Area	$7x10^{-6}$	$6x10^{-2}$	$8x10^{-2}$	$4x10^{+1}$
Field Across Lower Kingtown Road	$5x10^{-6}$	$2x10^{-3}$	$4x10^{-2}$	$4x10^{+1}$
Lifetime Residents in				
Flood Plain Area	$1x10^{-5}$	$7x10^{-2}$	$3x10^{-2}$	$2x10^{+1}$
Field Across Kingtown Road	$7x10^{-6}$	$2x10^{-3}$	$1x10^{-2}$	$1x10^{+1}$
Direct Contact with Sediment				
Children playing in yard in Onsite Spring and Drain Across Lower Kingtown Road	$7x10^{-7}$	$5x10^{-5}$	$6x10^{+0}$	$5x10^{+2}$
Ingestion of Groundwater				
Lifetime Residents	$2x10^{-3}$	$4x10^{-1}$	$6x10^{+0}$	$4x10^{+5}$
Direct Contact with Dust				
Lifetime Resident	$7x10^{-8}$	$2x10^{-6}$	$4x10^{-4}$	$1x10^{-2}$
Barn retail users	$6x10^{-7}$	$1x10^{-5}$	$3x10^{-3}$	$6x10^{-2}$
Warehouse retail users	$2x10^{-6}$	$5x10^{-5}$	$5x10^{-3}$	$3x10^{-1}$

TABLE 14

Cleanup Goals For Soils and Sediments for The Myers Property Site

Contaminants	Cleanup Goal[1] (mg/kg)
Organic Compounds	
Total Base/Neutral/Acid Extractables	10
Hexachlorobenzene	10
Total DDT (DDT, DDD, & DDE)	10
Total Volatile Organic Compounds	1
Polycyclic Aromatic Hydrocarbons	10
2,3,7,8 Tetrachlorodibenzodioxin	0.001
Inorganic Chemicals	
Antimony	10
Arsenic	20
Barium	400
Cadmium	3
Chromium	100
Copper	170
Lead	250 - 1,000
Silver	5
Zinc	350

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[1]Derived from the Interim New Jersey Soil Action Levels and Appendix F of the Draft Final FS Report: Development of Chemical-Specific Remediation Criteria for the Myers Property Site.

TABLE 15

Cleanup Goals for Discharge of Treated Water to Ground Water at the Myers Property Site

Contaminants (in micrograms/liter)	Federal MCL	New Jersey MCL	New Jersey Ground Water Quality Criteria
Organic Compounds			
Benzene	5	1	
Chlorobenzene (mono)		4	
1,2-dichlorobenzene		600	
1,3-dichlorobenzene		600	
1,4-dichlorobenzene		75	
DDT, DDE, DDD			0.001*
Lindane (Gamma BHC)	.4	4	
Methoxychlor		100	100
1,2,4-Trichlorobenzene		8	
Inorganic Chemicals			
Arsenic	50	50	
Chromium	50	50	
Chromium (hexavalent)			50
Lead	50	50	
Silver	50	50	

*This standard is below NJDEP's method detection limit for DDT, DDE, and DDE.

TABLE 16

Detailed Cost Estimate of Alternative 5: Excavation, On-site Chemical Dechlorination and On-site Placement of Treated Soils (Based on APEG)

Item	Cost ($)
Construction	
Field Evaluation and Process Development, Mobilization, Installation and Start-up, Contingency, Engineering and Administrative Costs Contingency, Engineering and Administrative Costs	3,302,000
Treatment Unit Operation	
Labor, Health and Safety, Utilities, Excavation (Soils and Sediments), Backfill, Site/Wetland Restoration, Verification Sampling, Contingency, Engineering and Administrative Costs (Yearly Cost for Two Years)	13,204,000
Total Capital Cost (Amortized over Two Years)	25,947,000
Annual Operation and Maintenance - Post-Remedial Action	
Post Remediation Soil, Surface Water, and Sediment Monitoring, Contingency and Administrative Costs (Yearly Cost for Five Years)	29,000
Total Estimated Present Worth	**26,308,000**

TABLE 16 (continued)

Detailed Cost Estimate of Alternative 10: Extraction, On-site Physical Treatment and Discharge of Ground Water

Item	Cost ($)
Extraction, Treatment & Discharge System	
Sheet Piling, Collection Trench, Extraction Wells, Inorganic Chemical Precipitation and Granular Activated Carbon, Infiltration Gallery, Mobilization, Installation and Start-up, Contingency, Engineering and Administrative Costs	
Total Capital Cost	3,427,000
Annual Operation and Maintenance	
Extraction, Treatment & Discharge System	
Extraction Wells, Utilities, Labor, Inorganic Chemical Precipitation and Granular Activated Carbon, Maintenance, Contingency	
Annual Operation and Maintenance Cost - Five Years	3,024,000
Annual Post-Remediation Monitoring	
Ground Water Monitoring, Contingency, Engineering and Administrative Costs	
Annual Post-Remediation Monitoring Cost - 30 Years	441,000
Total Present Worth	**18,397,000**

TABLE 16 (continued)

Detailed Cost Estimate of Alternative 15: Decontamination of Buildings

Item	Cost ($)
Total Capital Cost	0
Annual Operation and Maintenance	
Equipment Rental, Sampling, Waste Disposal, Utilities, Mobilization, Labor, Contingency, Engineering, and Administrative Costs	
Total Annual Operation and Maintenance Cost	1,213,000
Total Present Worth	**1,213,000**

RESPONSIVENESS SUMMARY

FOR THE

MYERS PROPERTY SITE
FRANKLIN TOWNSHIP, NEW JERSEY

SEPTEMBER 1990

RESPONSIVENESS SUMMARY
MYERS PROPERTY SITE

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns and the U.S. Environmental Protection Agency's (EPA's) responses to those comments regarding the remedial investigation and feasibility study (RI/FS) report and Proposed Plan for the Myers Property Superfund site. EPA, in consultation with the New Jersey Department of Environmental Protection (NJDEP), has selected a final cleanup remedy for the Myers Property site after reviewing and considering all public comments received during the public comment period.

EPA held a public comment period from July 13, 1990 through September 12, 1990 to provide interested parties with the opportunity to comment on the RI/FS report and Proposed Plan for the Myers Property site. This included a 30-day extension to the public comment period at the request of Atochem North America, Inc. (Atochem). EPA held a public information meeting to discuss the remedial alternatives described in the FS and to present EPA's preferred remedial alternatives for controlling contamination at the Myers Property site. The meeting was held at the Franklin Township Municipal Building, Hunterdon County, New Jersey on July 24, 1990, at 7:00 p.m.

In general, the community was responsive to EPA's Proposed Plan. A majority of the local officials and residents recognized the importance of addressing the conditions at the Myers Property site. However, there was concern with regard to the cost of the preferred remedy. They also expressed a concern about the use of an innovative technology to treat contaminated soils and sediments at the site and about the length of time the Superfund process has taken in the past, and stressed that they would like EPA to expedite the remediation in order to avoid delay and additional costs that could be incurred as a result of delay.

This Responsiveness Summary is divided into the following sections:

I. **RESPONSIVENESS SUMMARY OVERVIEW:** This section briefly describes the site background and outlines EPA's preferred remedial alternative.

II. **BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS:** This section provides the history of community concerns and interests regarding the Myers Property site.

III. **COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES:** This section summarizes oral and written comments received by EPA at the public meeting and during the public comment period for the Myers Property site, and EPA's responses.

IV. **APPENDICES:** Five appendices are attached to this report. They are as follows:

Appendix A - the Proposed Plan that was distributed to the public on July 12, 1990;

Appendix B - the public notice which appeared in the July 19, 1990 issue of the Hunterdon Democrat, and the public notice announcing the extension of the public comment period;

Appendix C - sign-in sheets from the July 24, 1990, public information meeting held at the Franklin Township Municipal Building;

Appendix D - the transcript from the public information meeting;

Appendix E - comments from New Jersey State Senator Richard Zimmer, and EPA's response letter; and

Appendix F - written and oral comments received during the public comment period. EPA's responses to written and oral comments are provided in Section III.

I. RESPONSIVENESS SUMMARY OVERVIEW

A. SITE DESCRIPTION

The Myers Property site is located in Franklin Township, about one and one-half miles north of Pittstown, Hunterdon County, New Jersey. The site is bordered to the north by Cakepoulin Creek and is bisected by Lower Kingtown Road. The Myers Property site covers approximately 5.7 acres. In the 1940s, manufacturing firms utilized the site for production of the insecticide p,p-dichlorodiphenyltrichloroethane, commonly called DDT.

The Myers family purchased the property in 1971, and lives in a residence on the site. A former mill structure, with a cornerstone marked 1827, survives on the property, along with the Myers residence, a concrete block warehouse building and several former process buildings.

B. SITE HISTORY

Franklin Township officials notified NJDEP of the presence of hazardous materials at the Myers Property in 1979. Initially, a shed located on the site contained approximately twenty unlabeled containers of chemicals, and the warehouse contained about twenty-four cubic yards of asbestos material. NJDEP collected samples at the site and identified the presence of metals, DDT, and other organic chemicals in the drums; sheets of asbestos in the warehouse; and contaminated surface soil and debris.

In September 1983, the site was placed on the EPA's National Priorities List (NPL) of Superfund sites. In August 1984, EPA removed a number of deteriorated drums, contaminated soil, and debris. This removal action significantly reduced a short-term health concern posed by the material removed.

In 1985, EPA identified the Pennwalt Corporation (now Atochem North America, Inc.) as a potentially responsible party (PRP) as a result of its activities on the site. On August 1, 1985, EPA notified Pennwalt of its potential liability and offered the company the opportunity to undertake the RI/FS. Pennwalt failed to respond within the time period specified, and, in 1985, EPA initiated a remedial investigation using Superfund money. The purpose of the RI/FS was to determine the nature and extent of contamination, characterize site risks, and develop and evaluate remedial alternatives.

Soil and sediment contaminants include chlorinated pesticides (in particular, DDT and its breakdown products, DDD and DDE), volatile and semivolatile organic compounds (in particular, chlorinated benzenes), polycyclic aromatic hydrocarbons (PAHs), chlorinated dioxins and dibenzofurans, and inorganic chemicals (in particular, arsenic, cadmium, copper, and lead). Contaminants were found to be evenly distributed over an extensive area, covering approximately 7.5 acres, and extending to the depth of bedrock.

Trace concentrations of pesticides and other organic compounds and metals were identified in sediment samples collected in Cakepoulin Creek, with higher concentrations in spring drainage pathways on the site. No volatile organic compounds (VOCs) or pesticides, and only trace concentrations of inorganic compounds, were found in any surface water samples. Fish samples collected from Cakepoulin Creek had low levels of DDT and other contaminants.

Ground water sampling has revealed high concentrations of monochlorobenzene and other VOCs along with lower levels of DDT and metals in monitoring wells located on the site, to a depth of about 30 to 40 feet. Ground water samples obtained from both the shallow and bedrock water-bearing zones were found to be highly contaminated with organic and inorganic contaminants. Sampling of wells located north and east of the site has shown non-detectable or trace levels of contamination.

Residential wells in the area have been monitored periodically for the presence of contaminants. One sampling event (September 1989) identified the presence of trace concentrations of chlorobenzene in three of seven private wells sampled. However, a subsequent sampling event (December 1989), and all previous sampling events, showed non-detectable levels in all private wells. While the potential for drinking water contamination does exist on and near the site, there is no evidence to indicate that drinking water sources currently pose a threat to human health.

The mill and warehouse buildings on the site are contaminated with DDT, DDD, DDE, hexachlorobenzene, and metals. The on-site residence also contains low levels of DDT contamination, though the contaminant levels detected do not pose an imminent threat to human health. Air samples collected in the buildings indicated no detectable concentrations of contaminants.

A Public Health Evaluation and Environmental Assessment (PHE) was performed to evaluate the magnitude of public health and environmental impact if no remediation were to be conducted at the site. Contaminants of potential concern were identified in ground water, fish tissue, buildings, soils, and sediments. In all media, pesticides and inorganic compounds were identified as contaminants of potential concern. In addition, VOCs were identified as contaminants of concern in ground water.

The current- and future-use exposure pathways evaluated in the PHE were those believed to be associated with the greatest potential exposures. The exposure pathways which were evaluated included direct contact (e.g., dermal contact) with contaminants in soils, sediments, building dust, or surface water, and the ingestion of contaminated ground water under a future land use scenario.

C. SUMMARY OF EPA'S PREFERRED ALTERNATIVE

EPA's remedy selection for the site is based on the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Contingency Plan (NCP). Under the requirements of CERCLA, SARA, and the NCP, a selected site remedy must be protective of human health and the environment, cost effective and in accordance with other statutory requirements. SARA also emphasizes permanent solutions incorporating on-site remediation of hazardous contamination whenever possible.

After careful consideration of all reasonable alternatives and the evaluation criteria specified in the NCP, EPA recommended the alternatives described below to address contaminated soils and sediments, buildings, and ground water. The preferred alternatives were presented to the public in the Proposed Plan and discussed at the July 24, 1990 public meeting.

The remedial action objectives for soils and sediments are to prevent contact with the media contaminated with concentrations posing an unacceptable human health risk. To meet this goal, EPA and NJDEP established cleanup goals for contaminants in soils and sediments at the site. The ground water remedial action objective is to prevent human contact with contaminated ground water. Because insufficient data is available to fully evaluate ground water contamination, an interim remedy is being selected. This interim remedy will include the provision of point-of-use treatment to local residential wells should they become contaminated, the initiation of an extraction and treatment program to start to remove contaminants from the most highly contaminated regions of the ground water, and the collection of additional information to determine a final remedy for the ground water.

The FS evaluated seven alternatives for remediating soils and sediments, five alternatives for remediating the ground water, and four alternatives for remediating contaminated buildings on the Myers Property. Two soils and sediments alternatives from the FS (Alternatives 5 and 7) were considered sufficiently similar to be combined into a single alternative (Alternative 5) In the Proposed Plan, EPA recommended preferred alternatives for site remediation. These included Alternative 5 (chemical dechlorination) for soils and sediments, Alternative 10 (physical treatment) for ground water, and Alternative 15 (decontamination) for buildings.

Soils and Sediments Remediation Alternative

Alternative 5 Excavation, On-site Chemical Dechlorination, and On-site Backfilling of Treated Soils

Estimated Capital Cost:	$25,947,000*
Estimated Annual O & M Costs:	$ 29,000 (5 years)
Estimated Present Worth Cost:	$26,308,000
Estimated Implementation Timeframe:	2 years

*Includes the estimated construction and operation costs of a soils treatment facility for two years.

Contaminated soils would be excavated and treated on site by an innovative process that dechlorinates organic molecules. For cost estimating purposes, 48,700 cubic yards of contaminated soils would be excavated, corresponding to an excavation to the water table and to the cleanup goals established for the site. Treated soils would be tested and returned to the site.

Excavated soils would be fed into an on-site chemical dechlorination reactor unit. Two processes (APEG and nascent state hydrodechlorination) have been demonstrated to be effective at treating DDT-contaminated soils from the site by means of bench-scale treatability studies. Both APEG (which refers to the active process reagent: alkali polyethylene glycol) and nascent state hydrodechlorination (NSH) apply a process whereby chlorine atoms are removed from chlorinated compounds such as DDT, to render compounds that are safer and more easily biodegraded in the environment. The treatability study results showed that DDT, DDD, DDE, and hexachlorobenzene can be dechlorinated to less than 10 milligrams per kilogram (mg/kg). Washing to remove process reagents and soluble reaction by-products can be adapted to extract inorganic contaminants from the soil prior to returning it to the site. Both processes are expected to be effective at treating dioxins and dibenzofurans.

The O & M costs include post-remediation monitoring costs to assure the effectiveness of the remedial action. It is anticipated that monitoring would be performed annually for five years.

Ground Water Remediation Alternative

Alternative 10 Extraction, Physical Treatment and Discharge

Estimated Capital Cost: $ 3,427,000
Estimated Annual O & M Costs: $ 3,024,000 (5 years)
Estimated Annual Monitoring Costs: $ 441,000 (30 years)
Estimated Present Worth Cost: $18,397,000
Estimated Implementation Timeframe: 5 years

A temporary shallow ground water barrier would be installed around the affected area. A trench and/or shallow ground water extraction wells would be placed within this barrier to control shallow ground water flow and to facilitate extraction of ground water for treatment. For cost estimation purposes, a treatment scheme has been developed consisting of metals removal by weak acid cation exchange and activated alumina, and organics treatment by granular activated carbon (physical treatment). Heavy metal sludge and spent carbon would be disposed of off site in accordance with applicable or relevant and appropriate requirements (ARARs) and treated water discharged to ground water through injection wells or infiltration galleries.

The location of infiltration galleries or injection wells would be determined in remedial design. It may also be possible to discharge treated water to Cakepoulin Creek, if it can be demonstrated that a treatment technology can comply with NJDEP's surface water discharge requirements. However, treated water discharge to ground water has been assumed here for cost estimation purposes, based on compliance with the health-based criteria.

Under this alternative, exploratory ground water pumping wells would be installed in the area of highest contaminant concentration in the bedrock water-bearing zone, in an attempt to contain and remove contamination from that water-bearing zone. Also, periodic sampling of private wells would be included.

A contingency to this alternative would be the provision of point-of-use treatment to residential wells should drinking water supplies become contaminated or threatened. Therefore, the primary remedial action objective for ground water would be satisfied through the implementation of this alternative, because ingestion of contaminated water would be prevented.

Annual O & M costs would be incurred during operation of the extraction, treatment, and discharge system. Ground water monitoring shall be used to evaluate the effectiveness of the remedial alternative. Five years of system operation and thirty years of periodic monitoring have been assumed here for cost estimating purposes.

Building Remediation Alternative

Alternative 15 Decontamination

Estimated Capital Cost:	$1,213,000
Estimated Annual O & M Costs:	None
Estimated Present Worth Cost:	$1,213,000
Estimated Implementation Timeframe:	6 months

Gritblasting, wiping, and dusting, as appropriate, would be used to decontaminate the mill, warehouse, and on-site residence. The Myers family would be temporarily relocated during this action. Decontamination water would be treated on site using a conventional method similar to those discussed in the ground water treatment alternative, and discharged either to ground water or to Cakepoulin Creek. Solid-phase contaminants would be disposed of as hazardous waste.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

EPA initiated community relations activities in 1985 and developed a Community Relations Plan (CRP) to identify community concerns and address their requests. A copy of the CRP is located in the information repositories.

The RI/FS report and Proposed Plan for the Myers Property site were released to the public for comment on July 12, 1990. These two documents were made available to the public at information repositories maintained at the EPA Docket Room in Region II and at the Hunterdon County Public Library, Route 12, Flemington, New Jersey. The notice of availability for these two documents was published in the Hunterdon County Democrat on July 19, 1990. A public comment period on the documents was initially scheduled from July 13, 1990 to August 13, 1990, however, the public comment period was extended through September 12, 1990, at the request of Atochem. In addition, a public meeting was held on July 24, 1990. At this meeting, representatives from EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) answered questions about problems at the site and the remedial alternatives under consideration. A response to the comments received during this period is included in this Responsiveness Summary, which is part of this Record of Decision.

There has been active interest in the Myers Property site on the part of residents, local government officials, and Atochem. The primary interest currently lies with Atochem and those residents who live near the site and may be directly affected by the contamination.

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

This section summarizes oral and written comments raised at the public meeting and during the public comment period, and EPA's responses. The comments and corresponding responses are organized in the categories noted below.

A. Summary of Questions and Responses from the Public Meeting; presents a compilation of comments and EPA responses taken from the official transcript of the public meeting.

B. Summary of Written Comments and Responses Received During the Public Comment Period; presents comments received in writing by EPA during the public comment period and EPA responses.

C. Potentially Responsible Party Comments and Responses on the RI/FS and Proposed Plan; presents a compilation of comments received from Pennwalt Corporation (now Atochem) in June 1989, and from Comments on the RI/FS and Proposed Plan for the Myers Property Site, submitted by Atochem on September 12, 1990, and EPA responses.

A. SUMMARY OF QUESTIONS AND RESPONSES FROM THE PUBLIC MEETING CONCERNING THE MYERS PROPERTY SITE - JULY 24, 1990

A public meeting was held on July 24, 1990, at 7:00 p.m. at the Franklin Township Municipal Building in Hunterdon County, New Jersey. Following a brief introduction, the Remedial Project Manager, John Prince, discussed the alternatives presented in the Proposed Plan for the Myers Property site, and described the recommended alternatives in detail. The transcript of the public meeting is included in Appendix D. Concerns raised by the public following Mr. Prince's presentation included the following:

1. Who was responsible for developing the plan and making the decisions regarding cleanup at the site?

EPA Response: The RI/FS and Proposed Plan for the remediation of the Myers Property site were developed by EPA, in conjunction with NJDEP. The documents were reviewed and commented on by appropriate environmental staff at both agencies, including water management, air, wetlands, environmental impacts, and other programs. EPA's selection of remedies is based on the requirements of CERCLA, SARA, and the NCP. The actual selection of a remedy for the Myers Property site will be made by the EPA Regional Administrator and will be documented in a Record of Decision.

2. What compounds are formed in the process of chemical dechlorination? Have they been judged to be non-toxic by the ATSDR?

EPA Response: In a chemical dechlorination process, one that removes chlorine atoms from chlorinated organic molecules, a variety of dechlorinated by-products remain. Within the soil media, which contains a high percentage of natural organic material in addition to the chlorinated organic contaminants, it is often very difficult, if not impossible, to identify exactly what breakdown products are formed. The toxicity of DDT, as with many organic compounds, is a function of its degree of chlorination (i.e., more highly chlorinated molecules are more toxic). EPA has conducted toxicity studies on the soil and will be performing additional toxicity studies during the pilot stage. It is known that the DDT and dioxin molecules, in addition to hexachlorobenzene, were near to fully dechlorinated in the treatability studies, and that no other chlorinated molecules were formed. To identify the organic molecules that remain is a process of sorting out an already predominantly organic material. What EPA has demonstrated is that the soil containing chlorinated organic contaminants, which poses a health risk, is detoxified through removal of the chlorine. None of the most frequently detected chemicals which have been identified as posing a health or environmental risk (e.g., the Target Compound List) were present in the soil after treatment. During the pilot stage and during the remedial design, EPA will ensure that the residual soils are of a nature such that they can be delivered back into the ground.

While ATSDR has not evaluated the individual constituents involved in the treatment process in relation to the Myers Property site, ATSDR did review and support the proposed remedy.

3. What is the total time involved in remediation of this site? Is there any time limit?

EPA Response: The time frame is partially dependent on the period of discussion or negotiation with PRPs to determine whether they are willing to perform the work. Once initiated, a remedial design typically takes approximately one year. Because of the complexity of the Myers Property site, the remedial design may take longer than one year, regardless of whether the proposed remedial alternatives or one of the other active alternatives are implemented. EPA anticipates that, once initiated, the preferred alternative for soils will take approximately two years to implement and will consist of excavating the soil, putting it through the treatment unit, testing to verify that there are no residual materials that are harmful to human health or the environment, and backfilling the treated soils at the site. The duration of the ground water portion of the remedy will be approximately five years, at the conclusion of which, the effectiveness of the interim remedy will be evaluated, and a final remedy selected. There is no time limit or time restriction regarding site cleanup. However, in regard to the Myers Property site, EPA estimates that remedial design, including pilot studies, would take approximately one to two years, at which time actual remediation could begin.

4. Would the soil be excavated and removed from the site or would the soil be treated on site?

   EPA Response: The soils would be treated in mobile units which would be transported to and set up on the site. The treated soils would then be returned to the excavated areas.

5. What will be done with the substance that dechlorinates the soil?

   EPA Response: EPA evaluated two different treatment technologies, both of which chemically dechlorinate the organic contaminants in the soil. The water-soluble reagents involved in each technology would be introduced into the treatment units along with the contaminated soil. A reaction takes place, and the liquid fraction, containing soluble organic reaction by-products, is separated from the soil. The soil is then washed to remove residual reagents and additional contaminants. The treated soil is subsequently backfilled on the site. The residual liquid from the soil washing process contains reagents which are recycled. Although these reagents are non-toxic, any residual reagent left after processing would be taken off site for appropriate treatment and/or disposal.

6. Where does this site rank in New Jersey among the priority sites? Does the contamination on site warrant the proposed $47 million cleanup plan in light of the fact that a family has been living there for many years?

EPA Response: Of the 109 NPL sites in the State, New Jersey has ranked the Myers Property site as 91. The ranking of sites on the NPL does not necessarily have a bearing on the order in which they are addressed. Each site is evaluated based on the hazards and risks which it presents, not its position on the NPL.

ATSDR has been involved with the site for a number of years and has conducted health assessments. ATSDR has stated that the Myers Property site presents a significant health threat. The site contains a variety of chemicals which pose both carcinogenic and non-carcinogenic health risks. EPA, in conjunction with ATSDR, assessed the potential health risk posed by the Myers family remaining on the property. It was determined that there was a substantial health risk associated with the continued use of the floodplain area, but that no imminent and substantial health threat was posed by the Myers family remaining in their home. The Myers family agreed to restrict their activities to the area around their home.

7. What kind of tests were done at the Myers' home?

   EPA Response: Blood tests and drinking water samples were collected. Samples of household dust and wipe samples from building surfaces, were also obtained.

8. How extensive will the testing be of residential wells in the area? What is the current testing plan?

   EPA Response: EPA is currently testing wells within approximately one-half mile of the site, in the direction of ground water flow. These wells have not shown impact from the site; however, periodic sampling of these residential wells will continue under the selected remedy.

9. Has the EPA conducted any radiation testing at the site or along the River?

   EPA Response: EPA had conducted radiation testing at the initiation of the RI field investigation.[1] In addition, because of allegations made at the public meeting that radiation was found downstream from the site, a radiation

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[1]At the public meeting, EPA stated that no radiation sampling had been done. However, radiation testing was actually performed at the start of field activities. For health and safety reasons, it is standard protocol to check for radiation prior to initiating a new field investigation, as was the case at this site. No radiation above background levels was detected.

scan was performed on August 9, 1990. Again, no radiation was found in excess of the natural background levels.

10. How extensive has the sampling of Cakepoulin Creek been?

    EPA Response: EPA has tested the creek from approximately one-half mile upstream of the site to the point downstream where it meets the South Branch of the Raritan River. EPA found low levels of DDT in the sediments that lie along the creek bottom downstream of the site. EPA also identified some trace levels upstream of the site. However, DDT was a very commonly used pesticide in the past and was probably used in this area for the spraying of fields or for mosquito control. These levels cannot necessarily be attributed to the site. There has been no substantial impact on the creek.

11. Who will pay for the cleanup at the site?

    EPA Response: Under the Superfund program, EPA generally first attempts to have the parties who are responsible or potentially responsible for contamination at a site perform remedial activities. In the beginning of the Myers Property site project, EPA offered these parties the opportunity to perform the RI/FS; however, a response was not received in a timely manner, and EPA elected to conduct the RI/FS using Federal funds. A similar offer will be made to the PRPs regarding remedial design and remedial action. If no agreement is reached, EPA will fund the remedial design and remedial action using Federal funds, perform the remediation, and pursue enforcement options for the recovery of all Federal costs.

12. Will negotiations with the chemical company interfere with the plans for site cleanup?

    EPA Response: EPA will enter into discussions with the PRPs during a negotiation period. This period is usually 60 to 90 days. If it does not appear that negotiations will be successful in a reasonable time frame, EPA will proceed with the remedial design and implement the remedy, subject to the availability of funding.

13. What would the long-term impact be if the site were not remediated?

    EPA Response: The DDT and other contaminants found in the soils would continue to present a health hazard to individuals coming in contact with them. In addition, the contaminants would continue to leach into the ground water. While DDT does not normally leach into ground water, there are conditions at the Myers Property site that enhance the solubility of DDT. A variety of solvents exist at the site which assists in the solubilization of DDT in ground water. Because of this condition, there is a potential for private drinking water wells to become contaminated in the near future if the site remains unremediated.

14. Could the proposed site remediation make site conditions worse? In other words, could the rate of leaching and contaminant migration be increased by disturbing the area? Would containment be a better plan?

EPA Response: EPA evaluated containment as an option. However, there are several major problems with attempting to perform containment on this site. Predominantly, the site is located within the 100-year floodplain of Cakepoulin Creek. Because of the strong potential for flooding, there is no guarantee that a cap on this site would remain in place. EPA does not consider containment to be a permanent remedy.

Partial containment of the ground water, however, is incorporated in the Proposed Plan. Sheet piling will be installed at the site to facilitate extraction of the ground water. Ground water extraction wells will be installed at various locations throughout the property to control the direction of ground water flow. Contaminant migration from the site will be minimized by this process.

It is anticipated that site remediation will not increase risks to the environment, but will considerably reduce them.

15. Has APEG been used successfully in the past?

EPA Response: APEG has been used in the past to chemically dechlorinate both soils and liquid wastes contaminated with pentachlorophenol, polychlorinated biphenyls, and dioxins. In 1986, the APEG process was used at the Western Processing Superfund site in Kent, Washington, to treat 7,550 gallons of spent solvent containing 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD). However, this would be the first time that soils in New Jersey were dechlorinated using this procedure. In treatability studies performed recently using Myers Property site soils, the APEG process showed success at dechlorinating and detoxifying soils. Further pilot studies are proposed to verify toxicity results and provide design information prior to full-scale implementation of an APEG system.

16. Will the soils be treated for metals also?

EPA Response: Yes. In the dechlorination process, there would be a metals removal step. It is anticipated that in the NSH process, metals will be directly removed during soil treatment. With the APEG process, it is anticipated that metals would be removed after dechlorination in a soil washing step.

17. Will site operations be five days a week, eight hour days? Will operators be wearing white environmental suits?

    EPA Response: Answers to these questions will be developed during the design phase. During this phase, the actual operations of this system will be examined as well as potential impacts to the surrounding neighborhood. EPA will continue to work with the local residents and officials to minimize any disruption to the community. Public concerns and involvement remain very important to EPA throughout the duration of activities at Superfund sites.

18. Is EPA aware that the site area has bridges with very limited acceptable weights?

    EPA Response: EPA is aware of this and measures will be taken, as necessary.

19. When is the final decision made on the proposed plan?

    EPA Response: The final decision will be made after the conclusion of the public comment period which extended through September 12, 1990. A final decision will probably be made by the end of September.

20. Would EPA be willing to put filters on all residential wells within a two-mile radius?

    EPA Response: EPA will continue the periodic monitoring of potable wells which could potentially become impacted by site-related contaminants. The remedy incorporates the provision for point-of-use treatment systems, should the need arise.

B. SUMMARY OF WRITTEN QUESTIONS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

The public comment period was held from July 13, 1990, to September 12, 1990. Concerns raised by members of the community and other interested parties are presented in this section. Responses to comments provided by PRPs are addressed in the following sections.

1. What precautions will be taken to ensure that site remediation activities will not present additional health hazards through air and water pollution?

EPA Response: All remedial activities will be designed to minimize any short-term risks associated with those activities. For example, the ground water containment and extraction systems will be designed to isolate the ground water on site and treat the water to achieve very stringent discharge limits. Treated water will be either discharged to Cakepoulin Creek or reinfiltrated into the ground water. In the event that any private potable wells in the area become contaminated in the future with site-related contaminants, measures will be taken to prevent exposure (such as point-of-use treatment). No air impacts are anticipated from the selected alternatives, however, potential sources of air releases will be identified prior to implementing the remedy, and measures will be taken to eliminate or minimize the likelihood of a release. Contingencies will be in place to protect the surrounding community during site remediation. Dust generation will be minimized, air emissions from the treatment units will be treated, as necessary, and other health and safety precautions taken to ensure a safe working area.

2. Will the health risks associated with the remediation project be greater to nearby residents than if the property were allowed to remain as is?

   EPA Response: No. Significant levels of contaminants, posing carcinogenic and non-carcinogenic health risks, have been found at the site. As a result of these findings, EPA has determined that a significant health risk exists at the site which requires remediation. Precautions will be taken to mitigate risks to the surrounding area during remediation.

3. How can EPA be certain that residuals left over from the remediation process will not be toxic? How can we know that the proposed $26 million system (for soils and sediments) will even work?

   EPA Response: The results of bench-scale treatability studies demonstrate that the proposed chemical dechlorination processes will be effective at dechlorinating organic contaminants, and can be adapted to address inorganic chemicals. In addition, EPA will perform comprehensive pilot studies which will help further refine process parameters, examine treated soil toxicity, and update costing data. The pilot study data will be used to design full-scale systems for the site remediation.

4. The vendor for the APEG process (Galson Remediation Corporation) provided comments on the Proposed Plan, noting several inconsistencies between its process and EPA's

generic description of a chemical dechlorination alternative. The letter is included in Appendix F.

5. It is clear from the RI database and subsequent environmental studies by NJDEP and EPA's Environmental Response Team (ERT) that a single soil cleanup criterion is not appropriate for both the wetland area and the remainder of the site. A single soil cleanup criterion should not be applied to both parcels.

   EPA Response: While NJDEP has advised that a higher cleanup goal for DDT in the wetland may be protective of the local environment, the proximity of the wetland to Lower Kingtown Road and nearby residential areas provides for easy access and potential human contact, and the availability of similar risk scenarios to those identified in the FS report for the non-wetland area. This wetland is a high quality natural resource and is presently a valuable habitat for local wildlife. Therefore, the wetland area impacted by implementation of the selected remedy will be carefully restored.

6. The non-wetlands portion of the property is a low quality ecosystem, and is highly contaminated, and the cleanup goals proposed in the proposed plan should be achieved for this parcel.

   EPA Response: EPA agrees with this comment. However, it should be noted that the distinction between the wetland and non-wetland areas cannot be clearly drawn. While the center of the non-wetland parcel does not appear to support vegetation, the western and northern perimeters of the contaminated area also appear to support a high quality ecosystem similar to the State-designated wetland. In addition, the entire site lies within the Capoolong Creek Wildlife Management Area.

7. The wetland parcel is a closed canopy, fully functional wetland of high resource value. The high concentration of organic matter in this area serves to retain organic contaminants and keep them from entering the food chain. NJDEP performed a natural resource risk assessment, concluding that due to a lack of human exposure in the wetland, a cleanup number should be based on natural resources. The risk assessment infers that destructive remediation is not justified in the wetland. The risk assessment was based on NJDEP and ERT studies involving an extensive database on site fauna, and concludes that the present value of the site as an environmental resource far out-weighs the possible value of destructive remediation.

EPA Response: NJDEP agrees with the identification of a single remediation goal across the site for total DDT and hexachlorobenzene. The PHE contradicts the commenter's interpretation of the risk to human health posed by the wetland. The ERT/NJDEP biota study cited by the commenter is a rough, working draft; the conclusions of this document, therefore, have not been finalized. A deficiency of this study may be its lack of a sufficient database to make a definitive assessment of the natural resource hazard posed by the site. However, bioaccumulation of DDT does appear to be significant in individual biota samples collected on site, as opposed to biota collected from an uncontaminated control area.

The bioaccumulation data from the ERT/NJDEP study was used by NJDEP's Bureau of Environmental Evaluation and Risk Assessment in a risk assessment model. This model concluded that, while DDT-uptake is clearly occurring from the site, the rate of bioaccumulation is not nearly as severe as was originally anticipated. From a natural resources standpoint, a less stringent cleanup goal may be appropriate. This cannot, however, serve to discount the potential human health risk posed by this area. ERT has been advised of this position and concurs with it.

8. The site should be treated as two separate and distinct parcels. The non-wetlands parcel should be addressed to achieve cleanup goals as discussed in the Proposed Plan. The remedy for the wetland should be "no action" with approximately five years of monitoring to assure protectiveness. This will substantially reduce the expense of the cleanup.

EPA Response: EPA disagrees with the justification for drawing a distinction between the two parcels. Due to the persistence of site-related contaminants in the environment, the "No Action with monitoring" scenario would be required for far longer than five years. The No Action alternative does not satisfy the nine criteria established in the NCP for evaluating alternatives. Cost is a factor only when comparing alternatives that have similar merit with regard to the other threshold and balancing criteria.

C. SUMMARY OF COMMENTS RECEIVED FROM ATOCHEM NORTH AMERICA, INC., ON THE RI/FS AND PROPOSED PLAN, AND EPA RESPONSES

This section presents comments from a report entitled Comments on the RI/FS and Proposed Plan for the Myers Property Site submitted by Atochem North America, Inc, and EPA responses. In addition, this section includes comments on the draft final RI report and the Public Health Evaluation and Environmental Assessment submitted by Pennwalt Corporation (now Atochem) in June 1989 (included as an appendix to Atochem's submittal), and EPA responses. Comments were submitted as a narrative rather than as specific numbered comments. In an attempt to concisely and comprehensively address Atochem's comments, the EPA has grouped many similar questions and comments. An attempt has been made to extract from the Atochem report the salient comments and concepts in each area in order to focus the response. The following questions, therefore, endeavor to reflect questions and comments detailed in the documents noted above and EPA's corresponding response.

REMEDIAL INVESTIGATION

Surface Sampling

1. A total of 408 surface and subsurface samples were collected during the three phases of the EPA investigation. Based on the results of the Phase I sampling, the areal extent of DDT contamination was delineated. In Phase I, sampling was conducted using a grid system to characterize the extent of surface soil contamination. There is no demonstrated reason why additional surface sampling (the subdivision of the Phase I grid) was needed in this same area. In fact, the results of the Phase II surface soil sampling indicated a contaminant distribution similar to that of Phase I, and was not necessary.

   EPA Response: Additional surface soil sampling during Phase II was intended to further characterize the nature and extent of surface soil contamination detected in Phase I by subdividing the Phase I grids. In addition, Phase II served to provide data for the selection of test pit locations, and to provide data to support remedial alternative development and evaluation. Use of a smaller grid size provided more refined delineation of the areal extent of contamination. It should also be emphasized that the Phase II program did not merely overlay the Phase I grid, but, in fact, expanded the extent of investigation to areas where Phase I grab samples had suggested possible contamination (particularly at the eastern end of the site).

Sample Heterogeneity

2. Atochem argues that the heterogeneity of soil samples as reported in the RI has not been fully explored in the data reporting. It is asserted that if portions of a given sample (rocks, stones, etc.) are excluded from the analysis, the excluded portion should be measured and factored into the reported data. At the same time, the Atochem comments acknowledge that the site contaminants are more likely to be associated with fine grained and organic materials, with the stones, gravel, glass, etc., being "relatively inert".

EPA Response: Atochem's comments imply that factoring the "inert" mass into the "contaminated" mass would result in lower "average" or "bulk" contaminant concentrations. They also, however, imply that contamination does exist at concentrations substantially higher than would be indicated by such average concentrations. Stones, gravel, glass, etc., were sorted out of field soil samples. This is standard procedure in Superfund investigations due to the physical limitations of the analytical equipment with respect to both bulk- and individual-sample size. Had sorting not occurred, the coarser fraction would most likely have been "artificially" separated in the laboratory where the "finer", most likely contaminated, materials would have been selected for analysis. Reported analyte concentration values do not, therefore, reflect the "bulk weight" of the entire sample but rather a concentration based on the actual sample aliquot analyzed in the instrument. The contamination associated with fine grained materials may pose the most significant problem, since these are the fractions most likely to be ingested or inhaled. If, in fact, the higher contaminant levels exhibited by the fine grained or organic materials pose sufficient risk to warrant remediation, the final effect on the FS would be slight unless such materials can be selectively excavated and/or treated apart from coarse materials. This is unlikely to be the case.

As with any RI, the description of areas of contamination based upon a finite number of samples from heterogeneous materials unavoidably involves uncertainty, with some risk of either overestimating or underestimating the extent and magnitude of contamination. The Myers Property site RI/FS used a large number of soil samples to reduce this uncertainty.

Naturally Occurring Materials

3. Several of the compounds or elements detected in site samples may occur naturally or as the result of other activities (not site-related). In order to assess the relevance of detectable quantities of such materials, expected natural background ranges or recommended levels of such compounds should be considered in addition to the concentrations detected.

EPA Response: Expected background concentrations of organic and inorganic chemicals were considered in the evaluation of site conditions. For instance, the RI report (page 3-26) specifically indicates that NJDEP action levels are used as a point of reference in evaluating whether metal concentrations are in excess of recommended levels. NJDEP action levels reflect current State guidance with respect to acceptable inorganic chemical concentrations.

The potential presence of organics arising from other sources is considered in the RI. For example, background samples were collected off site as a means of establishing site related contaminants. No VOCs or base/neutral/acid-extractable compounds were detected above quantifiable detection limits from background samples, and the highest concentration of DDT was 0.085 milligrams per kilogram (mg/kg).

Field Laboratory Data

4. EPA used an on-site field laboratory during Phase III of the RI to further define the extent of soil contamination. Atochem states that impure reference standards (DDT, DDD and DDE) were used during the field laboratory test program. Atochem stated that reference standards are typically 96 to 98 percent pure and standards used in this field study were only approximately 10 percent pure. Atochem indicates that all residue levels reported by the field laboratory should, therefore, be divided by a factor of ten.

   EPA Response: Calibration mixtures are prepared from pure reference material and run in mg/kg-range concentrations for each component. This practice is standard procedure in all current EPA pesticide analytical methodologies. The presence of multi-component standards has no implications regarding standard purity.

   Chromatograms of standards used in the field laboratory clearly show that only three peaks are present (one for each member of the DDT series), not eight to twelve. These three peaks represent 100 percent of the DDT series, not 10 percent. Furthermore, Figures 4-3 and 4-4 from Atochem's report are not standard chromatograms from this analysis.

5. Atochem indicates that from analysis of the data, it appears that the retention time for the key isomers of DDT, DDD, and DDE moved forward and back in time without pattern or certain cause. The claim is made that it is likely that a faulty gas flow controller in the chromatograph caused most of the problem of erratic, shifting peaks.

   EPA Response: Compound identification was conducted with daily retention time updates. Retention time was stable over each day. In addition, because two phases of soils data had already been analyzed prior to the start of the field laboratory analysis in Phase III, the Myers Property was a relatively straightforward site regarding sample analysis, with no question of compound identity. A fairly characteristic trace was observed throughout the site.

Peak retention time did not shift significantly. In addition to a new standard calibration made daily, a continuing calibration was analyzed following every ten samples. These standards would have clearly shown any shift in retention time.

Gas flow was checked every 24 hours with the results recorded in a log book. These data demonstrate that gas flow did not "move forward and back in time without pattern or certain cause."

6. Atochem states that one of the three principal chemical standard peaks (retention time approximately 12.3 minutes) was repeatedly labeled as the p,p'DDT isomer, whereas Atochem claims with a high certainty that the peak is o,p'DDD.

   EPA Response: Elution order is published for the standards used. Retention time is determined for the analytical system, not researched from literature. In no instance were any of the principal peaks identified at 12.3 minutes. The daily and continuing standards clearly demonstrated that no peaks were present after 11 minutes. It is incorrect to state that a literature-reported retention time is 24 minutes and imply that it is universal, when retention time is a function of temperature program, gas flow rates, and several other factors.

7. Atochem states that the field analytical method was not raised to a minimum level of reliability. Atochem states that "all recovery studies failed to produce reliable recoveries, or produced variations in results of ±20% for multiple samples."

   EPA Response: Twenty-four spiked samples were analyzed. For the purpose of this study, spike recoveries were required to be between 70 and 130 percent. This is considerably narrower than the acceptable Contract Laboratory (CLP) range of 23 to 134 percent. Only five of the samples were biased slightly high, and two samples were biased slightly low. This is not considered to be a significant result. Only six of twenty-five duplicates were outside the ±20 percent range. These results demonstrate good, or at least reasonable precision.

8. Atochem states that a "review of the development documents for the field analytical method did not show the institution of a reliable Quality Control Program."

EPA Response: The quality control program for the field laboratory was developed by EPA's contractor, and reviewed and approved by EPA prior to field deployment. The quality control program included:

- o Daily method blanks to demonstrate contaminant-free reagents, solvents, instruments, etc.
- o Daily instrument calibration
- o Continuing calibration every 10 samples
- o Minimum of 10 percent duplicates and spikes (18 percent during actual operation).

The approved quality control program was adhered to in the field and the log books document all instrument maintenance and condition. In addition, EPA conducted field audits of the operation. The audits show that the work was being performed using acceptable laboratory practices.

9. Atochem notes that U.S. Testing Company, Inc., (UST), one of the CLP laboratories to which soil samples from the Myers Property site were assigned by EPA, was subsequently suspended from the CLP and that data from certain CLP cases analyzed by UST had been called into question. One of the affected CLP cases was CLP Case No. 9158, comprising subsurface soil samples from the Myers Property site. Citing correspondence between EPA and its contractor, concerning the potential effects of this problem on the interpretation of soil results, Atochem concluded that elimination of data from Case 9158 "reduces the extent of DDT present and, as a result, changes the approach to remediation." Finally, Atochem asserts that EPA minimized the impact of this problem by substituting the field laboratory data.

EPA Response: Case 9158 consisted of 14 subsurface soil samples from the RI Phase III soil boring program, and two field blanks used as a check against sampling errors during the field effort. As such, the soil samples comprising Case 9158 constitute less than 20 percent of the total number of subsurface soil samples submitted for CLP analysis (including Phase II soil borings, Phase II test pits, and Phase III soil borings). Over 80 percent of the CLP subsurface soil data was unaffected by the potential problem with Case 9158.

Upon notification of the suspension of UST, EPA evaluated the potential effect of eliminating Case 9158 from the RI data. The correspondence cited and quoted by Atochem presents this analysis. While this evaluation indicated that elimination of Case 9158 would alter the extent of DDT contamination delineated by the CLP soil boring data, EPA determined that sufficient data were available, through the remaining CLP analyses and the field laboratory data, to proceed with the evaluation of remedial alternatives in the FS. In addition, the following points should be noted:

- The field laboratory effort was designed and intended to support the engineering evaluation of remedial alternatives in the FS. The field laboratory program was the subject of a separate certification effort consistent with the intended use of these data. The remaining Phase III CLP boring samples (exclusive of Case 9158) provide a split with the field laboratory samples of approximately eight percent as compared to the intended ten percent. The field laboratory data, in conjunction with the CLP data, were correctly used for their intended purpose, which was the estimation of the areal extent of contamination.

- The body of subsurface DDT data, including other CLP samples and the field laboratory data, is consistent with respect to the overall pattern of DDT contamination at the site, with the most extensively contaminated area being the floodplain portion of the Myers Property. Isoconcentration contours plotted without using Case 9158 data (presented in the cited correspondence) indicates contamination in excess of 10 mg/kg in the two- to four-foot interval. The preferred remedial alternative is consistent with these data. While the volume of soil may be subject to verification, EPA believes that the selection of the preferred remedial approach is not affected by the questioned data.

  Data from Case 9158 and the field laboratory were not used in the Public Health Evaluation. Therefore, the recommended cleanup goals for DDT are not affected by the status of Case 9158.

<u>Ground Water</u>

10. Atochem states that the RI incorrectly discusses chlorobenzene as a soil contaminant, when analysis of soils indicates very low to non-detectable levels of this compound.

    <u>EPA Response</u>: The term chlorobenzene (page 3-59) was not appropriately used in the RI report to indicate the presence of chlorinated benzenes (di-, tri-, and hexachlorobenzene) in soils. The discrepancy between elevated levels of chlorobenzene in ground water and very low to non-detectable

levels in soils is because only limited testing for VOCs in soils was performed during the investigation.

11. Atochem states that a discrepancy exists between soils and ground water data concerning chlorinated benzenes, and that no evidence from either soil chemistry data or analytical results from the shallow well at MW-02 identifies this area as a potential source of ground water contamination. In addition, a potential source area near MW-02 is not consistent with the appearance of significant chlorobenzene concentrations in wells MW-03 and MW-05, which would require the movement of a dense, non-aqueous phase liquid (DNAPL) from MW-02 to occur upward on the slope of a bedrock trough and against the flow of gravity.

    <u>EPA Response</u>: The identification of a potential contaminant source area near well MW-02 is the result of the review of historical air photos which indicate this area to have been the location of numerous storage tanks and buildings in the 1940s and 1950s, around the period when pesticides were in production. In addition, shallow well MW-02S had the highest levels of chlorobenzene, suggesting its proximity to a potential source of contamination. Most soil samples collected in this area were not analyzed for VOCs (including chlorobenzene) resulting in an apparent discrepancy between soils and ground water data.

    Contaminant distribution near MW-03 could also be predicted based on a review of historical air photos. In the case of MW-05, movement of DNAPL is controlled by a combination of factors, including not only gravity and the subsurface topography of less permeable bedrock surface, but also by joints and fractures in the bedrock. Existing fracture/joint patterns act as the dominant controls of free-phase migration, which, based on regional trends, could easily cut across the trough, resulting in DNAPL movement toward MW-05.

    The probable source area in the vicinity of MW-02 is one of several postulated by EPA, as opposed to Atochem's interpretation that only one source area (on the western portion of the site) may be present.

12. EPA does not consider potential co-solvent effects in the discussion of subsurface soils and ground water data.

    <u>EPA Response</u>: The co-solvency of benzene, chlorobenzene, and pesticides was considered by EPA is discussed in detail in the RI/FS.

Conclusions and Recommendations of the RI

13. Trichlorobenzene results were inaccurately reported as sediments and buildings contaminants.

EPA Response: The inclusion of trichlorobenzene as a sediment or building contaminant was erroneous. Trichlorobenzene was not a contaminant of concern for either media.

14. Atochem disagrees with RI comments concerning potential sources of chlorinated dioxins and dibenzofurans.

EPA Response: Analysis for dioxins and dibenzofurans were included in the RI because of the known occurrence of these materials in association with pesticide contamination. The RI report acknowledges that the source of these contaminants cannot be exactly determined.

15. Atochem feels that additional discussion is needed concerning the detection of dioxin and DDT in ground water across Cakepoulin Creek.

EPA Response: Resampling of wells in this area was recommended in the RI report. Resampling was performed on monitoring and residential wells in September 1989. No contaminants were detected in monitoring wells across Cakepoulin Creek. Complete results of that resampling are presented in the FS.

16. Atochem disagrees with several of the recommendations for additional monitoring wells, and with the proposed placement of some of the additional wells.

EPA Response: The recommendations made in the RI report are still considered appropriate to delineate the extent of ground water contamination and the mechanism of contaminant transport. Atochem has previously disagreed with some aspects of the RI report's interpretation of ground water data from the existing wells. Additional studies may ultimately be required to resolve present uncertainties and to arrive at a final determination with respect to management of the ground water contamination problem at the site.

Application of RI Results to the Public Health Evaluation

17. Atochem states that ingestion and inhalation of soil is not realistic because of large particles (rocks, etc.) present in the soil.

EPA Response: The presence of rocks in the soil does not diminish the need to estimate risk potential associated with ingestion and inhalation of the soil itself. Ingestion of soil occurs through hand-to-mouth contact, and handling of larger rocks with soil adhering to their surface is one potential exposure route. In addition, inhalation of finer soils that can become airborne is a reasonably assumed exposure route. The presence of rocks does not diminish the validity of the exposure scenario addressed in the public health evaluation.

18. Future residential use of the floodplain is restricted by law, so the assumption that a house could be placed there is inappropriate.

EPA Response: Residential development of the floodplain is plausible. The boundary between the current residence and the floodplain is artificial at best, and a house could be constructed adjacent to the current boundary of the floodplain. The use of a set of exposure assumptions representative of residential use of the floodplain is appropriate for evaluating the extent of risk posed by contaminants present in floodplain soils.

19. No one actually uses (or would use) the shallow ground water, so a risk assessment for future use of the water is inappropriate.

EPA Response: Ground water in both the surface alluvium and the bedrock formation beneath the site were extensively contaminated. The available residential well data does not indicate a problem with the migration of site contaminants at this time. However, the potential for chemicals to move to off-site wells remains, and the presence of a hydraulic connection between the shallow and bedrock water-bearing zones appears likely. Therefore, it was appropriate to consider the potential for exposure to both shallow and bedrock ground water in the risk assessment.

Public Health Evaluation and Environmental Assessment

20. The assumptions used to calculate a worst-case plausible maximum exposure scenario are implausible, if not impossible.

EPA Response: The plausible maximum exposure scenarios included in the risk assessment are conservative, but not implausible or impossible. It is difficult to assess the future use of land, and, therefore, use of conservative assumptions is warranted to protect against exposure situations that might not be clearly envisioned at present. The intent of a plausible maximum exposure scenario is to assess the upper bounds of a risk scenario. The risk assessment achieves this intent.

21. Atochem expressed a concern that the use of maximum detected concentrations with plausible maximum exposure conditions, such as increased frequency of contact, increased absorption potential through skin and other parameters, resulted in an exaggeration of the risk. It was suggested that the maximum concentrations found not be used. Instead, geometric means should be used with the plausible maximum exposure conditions to more realistically represent risk potential.

    EPA Response: The conventional approach to performing plausible maximum risk estimation involves use of the maximum concentrations encountered. This approach has been extensively used by EPA in the past to develop a conservative estimation of risk, and is still relevant.

22. The Toxicity Equivalency Factor (TEF) approach was not used in estimating non-carcinogenic health impact potential for chlorinated dioxins and dibenzofurans.

    EPA Response: The TEF approach can be used to estimate non-carcinogenic risk. However, such an approach will not change the outcome of the PHE. The risk potential presented by dioxins and dibenzofurans at the Myers Property site is driven by the carcinogenic aspect of those substances, not the non-carcinogenic potential, and the former will dictate the need to remediate. Hence, no adjustment in the revised remediation criteria is needed for those substances.

23. Fish tissue samples that were considered background could not be distinguished from other fish samples analyzed for dioxins and dibenzofurans. Only two dioxin and dibenzofuran analyses were validated, and it was unknown which sample represented the background location. Although both samples contained less than the current FDA level of concern of 25 nanograms per kilogram, the fact that the background sample could not be identified meant that subsequent calculations based on the fish sample results would be incorrect.

    EPA Response: No true background sample was collected from Cakepoulin Creek during the RI. The fish that were originally considered background simply could have migrated from an area impacted by the site. However, the fact that no dioxins and dibenzofurans were found in sediments of Cakepoulin Creek breaks any direct link between the occurrence of those substances in fish with the same materials found on the site. It is possible that the fish contain site-related materials at detectable levels as a result of biomagnification. There could be a number of other possible explanations for the finding of dioxins and dibenzofurans in fish samples. The PHE states that the samples would be conservatively assumed to be site-related. Thus, use of the data was not improper because of the stated assumption.

The lack of definitive data with regard to fish ingestion as a potential route of exposure led EPA to perform a second fish study in Cakepoulin Creek. The results of this study are summarized in a document entitled Final Report, Fish Bioaccumulation Study, Cakepoulin Creek, Myers Property Site, Franklin Township, New Jersey, dated March 29, 1990. In that report, no connection could be made between contaminants found in fish tissue and potential surface water discharges or sediment contamination from the site. DDT and dioxin concentrations in edible fish samples were found to be below public health guidelines. Thus, consumption of fish caught in Cakepoulin Creek is not considered to be a route of contaminant exposure.

24. Inaccurate and outdated bioavailability factors were used for some of the substances of concern.

EPA Response: The bioavailability information used in the risk assessment was well referenced and discussed by the authors. Since the bioavailability information was based on documented sources, rather than professional judgment, the assumptions surrounding absorption of the substances of concern are appropriate.

25. Typographical, transcription and numerical errors are noted in the tables reporting estimated risks for two exposure scenarios.

EPA Response: There are typographical errors in the risk assessment that cause some inconsistency between the tabular information and text. However, no substantive errors in calculations or the resulting discussion of those calculations have been identified.

26. Atochem argues that the absorption efficiencies of metals to soil should be incorporated into the exposure scenarios that considered incidental ingestion. Risks would be lower if absorption efficiencies, and correspondingly lower bioavailabilty, were considered.

EPA Response: While the bioavailability of lead, antimony, and cadmium was not considered in the ingestion pathway scenarios presented in the PHE, the impact on the criteria developed for remediation is insignificant. Antimony and cadmium did not present a risk even under the plausible maximum cases considered for surface soils. Only lead in soils near the home/warehouse/barn area and in the floodplain posed a potential problem under plausible maximum conditions. Use of a bioavailability factor may eliminate the slight risk posed by lead in the floodplain soils, but there would still be a need to consider reducing the level of lead in the soils near the house. The discussion of lead is considered appropriate.

27. The NJDEP action level for DDT in soil is 1 to 10 mg/kg, not 1 to 10 micrograms per kilogram ($\mu g/kg$) as shown in Table 4-13 of the PHE.

    EPA Response: The 1 to 10 mg/kg action level is reported correctly in other places, and was used in the derivation of remediation criteria.

28. The frequency of exposure shown in Table 4-20 in the PHE is in disagreement with the stated frequency of exposure appearing on page 4-106 of the PHE. Risks would be lowered if the assumptions presented in the text were used.

    EPA Response: There is a discrepancy in the information appearing in the text and the table, but the outcome of the delineation of risk is not affected. If the land across Lower Kingtown Road were to be used for residential purposes, substantial risk potential is present as is shown in Table 4-43 of the PHE. The future-use scenario represented by Table 4-43 depicts the unrestricted use of that land; therefore, it independently shows that remediation is warranted. In fact, the dose regimes shown in Table 4-43 form the basis for estimation of health risk-based recommended cleanup criteria in the revised document. Hence, there is no impact on the revised remediation criteria.

29. Risk assessments are based on conservatism, and EPA specifically notes in the Superfund Public Health Evaluation Manual, December 1989, that risks as high as $1x10^{-4}$ could be considered acceptable under certain circumstances. This comment is directed toward the use of the PHE in determining remedial options.

    EPA Response: EPA agrees with the general conclusion of this statement. However, the health risk posed by this site has been conservatively estimated to be greater than $1x10^{-4}$ in a number of exposure scenarios. Health-based remediation criteria, when developed site-specifically, use $1x10^{-6}$ as a point of departure. Under no circumstances are the levels implied to be "safe" or "unsafe".

30. The risk assessment does not comply with the requirements of the NCP and is inconsistent with the latest EPA guidance.

EPA Response: The NCP does not require that risk assessments performed under the past EPA policy be revised to reflect the requirements of the new NCP. The risk assessment generated for the Myers Property site conformed with the existing guidance and policy at the time of preparation. Furthermore, the new risk assessment guidance states that "Issuance of the new manual does not invalidate human health risk assessments completed before (or in progress at) the publication date." The risk assessment prepared for the RI at the Myers Property site was completed approximately nine months before the new guidance was issued.

31. Atochem submitted with its comments an Alternative Risk Assessment and a revised listing of major constituents driving the risk/hazard from soil contact in each area of the site. Atochem takes issue with EPA's designation of DDT as a probable human carcinogen, and, in its alternative risk assessment, calculated that DDT is not the cleanup driver for the Myers Property site. It is further stated that risk in no case exceeded EPA's acceptable range of $1x10^{-4}$ to $1x10^{-6}$ in the home/warehouse/barn area and in the field across Lower Kingtown Road.

EPA Response: Atochem's use of reduced exposure frequency and arithmetic means in its alternative risk assessment caused some changes in the order of importance of risk drivers in some cases. As shown in Table 3-6 of its report, the major driver of carcinogenic risk in the home/warehouse/barn area changed from TCDD to arsenic. The same case was evident in the field across Lower Kingtown Road, where arsenic superseded DDT. It is noted, however, that although the order of importance of the major risk drivers in the Atochem assessment differs from that presented in the EPA risk assessment, the same substances drove total risk in both risk assessments.

The alternative risk assessment submitted by Atochem used many of the same assumptions and exposure scenarios as the PHE, but arrived at very different conclusions with regard to the risk posed by the site. The differences between the two methodologies are listed below as a means of comparison.

Page 3-5 - No fish ingestion scenario was presented because of a judgment, by Atochem, of lack of sufficient sampling and analysis. The average and maximum risk potentials calculated in the EPA risk assessment were $2x10^{-5}$ and $3x10^{-3}$ excess cancers, respectively, and hazard indices of $1x10^{-1}$ and $1x10^{-2}$, respectively.

Page 3-5 - No ground water ingestion scenario was presented because of a judgment, by Atochem, of lack of sufficient sampling and analysis. The average and maximum assessments were $2x10^{-3}$ and $4x10^{-1}$ excess cancers, respectively, and hazard indices of 6 and $4x10^{+5}$, respectively.

Page 3-7 - In Table 3-2, the amount of soil consumed by children is less than that evaluated in EPA's risk assessment. EPA's values ranged from 67 milligrams per event (mg/event) to 275 mg/event. The alternative risk assessment values were 50 to 100 mg/day. For adults, the EPA assessment used 54 to 145 mg/event; the alternative assessment used 25 mg/day. Dust ingestion by children in the house was assumed to be 50 to 100 mg/day in the EPA assessment and 26 mg/day in the alternative assessment. The dust contact rates were similarly different from EPA's. Other exposure assumptions used that were reduced as compared with EPA's plausible maximum scenario were frequency of exposure (approximately halved) and total duration of exposure of adults (30-year maximum exposure potential versus 70 years).

On page 3-9, absorption through the gastrointestinal tract was assumed to be 25 percent for any substance with a Koc greater than 2,000. This approach halves the dose that was derived in the EPA's plausible maximum exposure scenario. Scientific evidence supporting such an assumption may exist, however, a literature citation was not included Atochem's alternative risk assessment.

On page 3-10, the dermal absorption potentials used in the alternative risk assessment are greater than those used in the EPA's assessment. For organics, values of 12 to 15 percent were assumed while values of 1 to 10 percent were assumed in the EPA assessment.

On page 3-10, inhalation dosages were estimated differently from those in the EPA risk assessment. However, the more conservative approach to calculating cancer risk potential used in the EPA assessment was within an acceptable risk range ($1x10^{-6}$).

Page 3-11 - The arithmetic mean was used in the alternative risk assessment while the geometric mean and the maximum concentrations were used in the EPA assessment.

There is no mention in the alternative risk assessment of the use of the upper 95 percent confidence interval of the mean as the reasonable maximum exposure concentration. The arithmetic mean was used to reflect reasonable maximum exposure in the alternative risk assessment. The new guidance (Human Health Evaluation Manual, page 6-14) specifically states that the upper 95 percent confidence interval of the mean should be used.

EPA has reviewed the PHE in light of the comments provided by Atochem. The PHE used accepted methods and appropriate assumptions in evaluating the potential human health and environmental risks posed by the site. Therefore, the conclusions of the PHE are valid and acceptable for use in establishing remedial action objectives for the site.

FEASIBILITY STUDY AND PROPOSED PLAN

Soils and Sediments

32. Discussions regarding the application of ARARs and health-based concentrations to the evaluation of technologies are insufficient. For instance, the FS does not relate spatial distribution of DDT with the distribution of all other constituents for which health-based remediation criteria were developed.

    EPA Response: The Agency conducted a comprehensive review of ARARs during the preparation of the FS, and ARARs that were identified were thoroughly considered during the evaluation of the remedial alternatives. The spatial distribution of site contaminants and the analysis of DDT distribution with respect to other site contamination was performed during the calculation of volumes of affected soils. This is discussed in Section 4.1 of the FS report, although delineation maps were not included. It was determined that DDT served as an appropriate indicator parameter for addressing remediation of soils. In addition, text on page 4-8 of the FS report states:

    > In addition, for each Phase II grid square, the remaining organic contaminants and metals concentrations were compared to ARARs and risk-based action levels. If the ARARs or risk-based action levels were exceeded, it was determined whether the corresponding soils were already contained in the DDT cleanup volume. If they were, then no further volume estimation was required for that grid square. If concentrations of organic compounds or metals were detected above ARARs...or action levels at a depth exceeding the DDT action level depth, an adjustment in excavation volume was made to accommodate this new depth.

33. The disruption caused by site activities has not been fully addressed. Appropriate control of migration of site constituents by soil erosion, rainfall, flooding and winds, on environmentally sensitive areas requires greater consideration.

EPA Response: Disruption caused by site activities was considered in evaluating each alternative in terms of the implementability and short-term risk criteria. Sufficient engineering controls exist to address these potential effects. For example, the FS report indicates that sedimentation control will be maintained through the use of a sediment fence. However, should this prove to be insufficient to control contaminant migration, particularly during excavation activities, additional erosion control methods will be implemented. These may include berming, temporary soil covering, installing sedimentation ponds, employing dust suppression techniques, or additional methods as deemed necessary during remedial design and/or field operations. Actual controls will be developed in detail during the remedial design.

34. The selected soil remediation processes do not meet NCP requirements. Specifically, neither APEG nor NSH provide overall protection of human health and the environment. The processes do not provide removal of metals. The quality of the treated soil has not been demonstrated to comply with ARARs.

EPA Response: Based on treatability studies of both processes, EPA believes that sufficient data exists to warrant their selection for the Myers Property site. Prior to final implementation of these processes, additional studies (e.g., bench and/or pilot studies) will be performed to further determine the effectiveness of the processes. These studies will also include additional toxicity studies. With regard to metals removal, the APEG and NSH systems will incorporate metals removal steps such that the treated soils will comply with ARARs. Treatability studies on these two systems did not examine metals removal; however, removal of metals from soil has been successfully accomplished in other instances through standard soil washing operations. It is anticipated that the results of both processes will achieve soil cleanup goals.

35. Excavation of the entire site area to five feet is not justified or based on the use of action levels.

EPA Response: The remedy is based upon the removal of contaminated soil present above the seasonal average ground water table. A depth of five feet was estimated in the FS, and corresponds to the average ground water depth at the Myers Property site. Excavation to the ground water table was selected as an appropriate depth to prevent inadvertent exposure to contaminated soil, since construction of buildings and installation of footings, as well as other intrusive activities at the site, would be unlikely to exceed this depth. The actual depth to ground water varies across the site and will be determined during remedial design. The estimated areal extent of excavation is based on the action levels documented in the FS.

36. Soil stabilization should be identified as a potential soil treatment technology.

EPA Response: Soil stabilization was evaluated in the technology screening conducted for the Myers Property site FS. This technology was not incorporated into any of the remedial alternatives at the site for several reasons. First, questions remain regarding the technology's ability to achieve the cleanup goals. In particular, it is not certain that these processes can immobilize (and detoxify) organic contaminants. Second, these technologies were deemed inappropriate with regard to the environmental setting of the site. Specifically, a concern was raised regarding the placement of stabilized, treated soils within a wetland area. In addition, many soil stabilization processes have resulted in dramatic waste volume increases, and on-site space limitations may, therefore, limit the feasibility of implementing this technology. The selected remedy will dechlorinate and detoxify chlorinated organic compounds, and remove inorganic contaminants prior to returning the soil to the excavated areas.

37. The calculations of health-based remediation criteria for soils are incorrect in that only the 10^{-6} cleanup concentrations were given. In a number of instances, the FS refers to evaluating soils and sediments alternatives with regard to achieving chemical-specific ARARs, when none exist for soils. The calculated remediation criteria were not compared to cleanup goals used at other Superfund sites.

EPA Response: The NCP states "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upperbound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response. The 10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when ARARs are not available..." The purpose for developing 10^{-6} cancer risk-based remediation criteria was to consider them in conjunction with NJDEP soil action levels to develop a cleanup goal appropriate to site-specific conditions. EPA has used them as such in the derivation of cleanup goals for the site. No chemical-specific ARARs are available for soils. The FS at times incorrectly identified NJDEP's soil action levels as ARARs because they were used as a basis for comparison in developing site-specific cleanup goals. However, the NJDEP soil action levels were used appropriately in the FS. The cleanup goals for the site were evaluated in terms of appropriate location- and action-specific ARARs.

The particular combination of health risk contributors and other site-specific conditions prevented the consideration of past cleanup levels at other sites as being appropriate for the Myers Property site. Because risk presented by the major contributors (hexachlorobenzene, DDT and metabolites, TCDD and related substances, arsenic) is, for the most part, additive, the use of past cleanup criteria at other sites do not reflect this additive potential presented by toxicants at the site. Therefore, the use of the health risk-based remediation criteria in the FS report is an appropriate point of departure for establishing cleanup goals at the Myers Property site.

38. Atochem presented revised remediation goals based on its alternative risk assessment, which used reasonable maximum exposures.

<u>EPA Response</u>: The revised remediation goals submitted by Atochem are purported to be based on the reasonable maximum exposure method of quantifying risk, as discussed in the <u>Human Health Evaluation Manual</u>. However, the revised remediation goals are not representative of the degree of hazard potential posed by contaminants at the Myers Property. These remediation goals are based on dosages calculated through use of arithmetic averages. In the <u>Human Health Evaluation Manual</u>, pages 6-19 and 6-22, specific instruction is given to use the upper 95 percent confidence interval of the mean as the reasonable estimate of the concentration likely to be contacted over time, not the arithmetic average. If, however, the calculated upper 95 percent confidence interval of the mean exceeds the maximum concentration of a substance encountered in a given medium, then the maximum concentration should be used. Atochem's alternative risk assessment underestimates dosage and risk potential and, therefore, underestimates cleanup goals.

39. Atochem believes that a future residential use assumption for the Myers Property site should be prevented by the use of institutional controls. To address this point, Atochem recommended that the FS and the Record of Decision provide that the remedy is conditional upon the current use of the site and, should that use change, EPA would modify the remedy as appropriate.

<u>EPA Response</u>: Institutional controls are valid considerations in evaluating overall remediation strategies. However, EPA does not believe that the use of institutional controls for a hypothetical future-use scenario can replace consideration of future residential use for the Myers

Property site. Furthermore, the NCP states that the "use of institutional controls shall not substitute for active response measures (e.g., treatment and/or containment of source material, restoration of ground waters to their beneficial uses) as the sole remedy unless such active measures are determined not to be practicable, based on the balancing of trade-offs among alternatives that is conducted during the selection of remedy".

Ground Water

40. Characterization of site ground water conditions is inadequate to establish a reliable and effective action program.

EPA Response: EPA believes that sufficient data has been collected to adequately evaluate and select an interim ground water solution for implementation at the site. Additional data will be collected during the design phase to appropriately design, install and operate the system. This approach is not only technically viable but also consistent with the Agency's policy of initiating cleanup operations at the earliest possible time, while continuing investigative activities, as necessary, to help optimize the selected remedy.

41. The extraction/recovery portion of the proposed ground water remediation program cannot be evaluated properly due to the lack of data. The goal of remediation of the bedrock aquifer should focus on preventing further constituent migration, preventing exposure to degraded ground water, and evaluate further risk reduction as stated in the NCP. The ground water system at the site and the extent of impact to the system require additional characterization before an extraction system can be defined to achieve this goal.

EPA Response: As stated earlier, EPA believes that sufficient data has been collected to adequately evaluate and select an interim ground water solution for implementation at the site. Additional data will be collected during the design phase to appropriately design, install and operate the system. The Proposed Plan acknowledged the uncertainty involved in predicting the ultimate effectiveness of the ground water extraction and treatment system. Further, the Proposed Plan acknowledged that, presently, it is not possible to predict whether the contaminated deep water-bearing zone can be restored to its original use within a reasonable period of time. This is primarily because the DNAPLs believed to be present are difficult to locate and extract from fractured bedrock. Through the interim remedial plan, EPA will collect sufficient information to assess the potential success of long-term remediation of the fractured bedrock zone.

42. Lack of site data makes it uncertain whether the proposed interim remedy for the bedrock aquifer will be consistent with the final remedy.

EPA Response: The proposed interim remedy for the bedrock aquifer incorporates the installation of three deep wells for the extraction of DNAPLs. These, and possibly additional wells will be placed at locations suspected of containing free-phase constituents based on RI results and any additional information that may be collected during the remedial design. Installation of such wells will yield data that will allow the Agency to assess the possibility for long-term remediation of the fractured bedrock zone. EPA believes that the interim remedy will be consistent with the final remedy.

43. Sheet piling would not be an effective barrier to ground water flow at the site.

EPA Response: Sheet piling was chosen for remediation of the Myers Property site to provide an effective barrier to shallow ground water flow, thereby expediting ground water recovery and cleanup. Although no difficulties are anticipated, should installation of sheet piling prove unsuccessful, an alternate means of controlling ground water flow would be implemented.

Buildings

44. Atochem states that the need for buildings remediation is not justified because the potential risks were well within the range of acceptable risks defined in the NCP.

EPA Response: While the NCP notes that, for "known or suspected carcinogens, acceptable levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}", it also states that the "10^{-6} risk level shall be used as the point of departure for determining remediation goals when ARARs are not available or are not sufficiently protective because of multiple contaminants at a site or multiple pathways of exposure". Based on the nature and extent of contamination known to be present in the buildings and on other areas of the site, and the potential for multiple exposures, remediation of the buildings is warranted.

45. The use of a theoretical approach to evaluate whether dioxins and dibenzofurans could be present in the buildings

on the Myers Property site was speculative at best and actual wipe sampling should have been conducted in lieu of speculation.

EPA Response: The sampling program conducted for the buildings was appropriate for the development of remedial alternatives and the selection of a remedy. However, since the potential for dioxin and dibenzofuran contamination was not known at the time samples were collected in the buildings, no actual determination of their presence or concentration in the buildings was made. With respect to the buildings, the assessment of risks, evaluation of alternatives, and selection of remedy were all based solely on existing data. Therefore, EPA estimated the extent of the contaminants based on theoretical, but realistic, assumptions. It should also be noted that, had actual concentrations of dioxins and dibenzofurans been established and used in the quantification of risks in the buildings, the risk estimates for the site might have been significantly greater.

Wetland Issues

46. Atochem asserts that many significant wetland issues were not adequately covered in the RI/FS and that the environmental and economic effects of remediation should be investigated prior to alternative selection. The suggested deficiencies include an incomplete estimation of wetland extent and classification, the potential cost of wetlands related work under each remediation alternative, and the lack of an assessment of the short- and long-term effects of the remediation alternatives on the wetlands.

    EPA Response: The State of New Jersey regulates wetlands under the "Freshwater Wetlands Protection Act," and the U.S. Army Corps of Engineers regulates wetlands under Section 404 of the "Clean Water Act." Furthermore, under Executive Order 1190, Federal agencies involved with actions at contaminated sites are required to conduct remediation efforts in a manner minimizing the destruction, loss, or degradation of wetlands. It has been acknowledged that there is a need to further define the limits of wetland areas at the site and to assess their value according to appropriate and approved evaluation techniques.

47. The eastern wetland area was classified as an exceptional resource value by NJDEP and the western wetland area may receive similar classification by NJDEP. The classification of the eastern wetland resulted from both the endangered and threatened raptors observed on site and because the wetland is adjacent to Cakepoulin Creek, classified as a trout

producing stream in the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9-4).

EPA Response: Previous documents relating to activities at the Myers Property site do not mention observations of endangered and threatened raptors on site. It is acknowledged that the site is within the breeding range of numerous birds of prey, many of which are classified as State and/or Federal threatened and endangered species, but documented observations of their residence on the site has not been found, and, therefore, not included in any site-related documents.

48. Shallow ground water remediation (i.e., Alternative 10) would destroy wetlands values.

EPA Response: Consistent with EPA guidance, the potential impacts to the wetlands will be assessed in conjunction with the wetlands delineation and functional assessment. Restoration of wetlands is included in the remedy for the site. The potential for dewatering the wetland as a result of this action will be evaluated during remedial design.

SITE HISTORY AND ADDITIONAL PRPS

49. The FS and Proposed Plan fail to adequately describe relevant site history, obscuring potential sources of constituents of concern.

EPA Response: The RI/FS and Proposed Plan document site history to the extent that this information is required in the remedy selection process, and include all pertinent facts known at the time.

50. The FS emphasizes pesticide handling on the property, and failed to mention that the Clinton Chemical Company operation manufactured anhydrous aluminum chloride, copper sulfate, and magnesium sulfate.

EPA Response: Information collected during the RI has shown that pesticides and chemicals apparently related to the manufacture of pesticides are the primary contaminants of concern at the site. The Clinton Chemical Company's on-site operation primarily manufactured anhydrous aluminum chloride, and large quantities of aluminum are present in site soils. However, aluminum does not significantly contribute to risk in any of the exposure scenarios discussed in the PHE. Inorganic chemicals that pose a risk to public health and the environment are relevant to remedy selection.

51. The FS highlights DDT production by one company and fails to mention other pesticide manufacturers or non-pesticide operations at the site.

EPA Response: On page 1-6 of the RI, it is stated that W.A. Allen Company, Elko Chemical Works, and Pennwalt Corporation are known to have been involved in pesticide production on the site. The summary of site history in the FS did not include all the details discussed in the RI. Information about other, non-pesticide operations at the site does not impact the remedy selection process.

52. Site history is incomplete because it does not include a discussion of the involvement of the U.S. Government in the production of DDT at the site. Successor liability is not discussed in the FS and Proposed Plan.

EPA Response: This information is not relevant to the remedy selection process. Atochem has recently provided information regarding the involvement of the U.S. Government in DDT production at the site. EPA has not completed an evaluation of the newly supplied information. Therefore, any discussion at this time would be inappropriate.

53. The last paragraph of the Site History section of the Proposed Plan should be rewritten, because it implies that Pennwalt (now Atochem) has been recalcitrant in its dealings with EPA.

EPA Response: An identification of Atochem's status as a PRP is appropriate in the Proposed Plan. The paragraph is simply a statement of fact. In 1985, EPA offered Pennwalt an opportunity to perform the RI/FS, giving the company a deadline to submit a written response with a good-faith offer to perform the work, and the deadline was later extended at Pennwalt's request. To this end, Pennwalt was neither timely, nor sufficient in its response, and EPA, with NJDEP concurrence, elected to conduct the RI/FS using Federal funds. These facts in no way portray Atochem as being recalcitrant. Atochem's interest and involvement in the RI/FS has been extensive for a fund-lead site. In addition, Atochem has agreed to reimburse EPA for the cost of constructing the security fence around the perimeter of the site.

IV. APPENDICES

Appendix A:	Proposed Plan
Appendix B:	The Public Notice which appeared in the July 19, 1990 issue of the <u>Hunterdon County Democrat</u>, and subsequent Public Notice extending the public comment period
Appendix C:	Public Meeting sign-in sheets
Appendix D:	Public Meeting Transcript
Appendix E:	Comment letter from New Jersey Senator Richard Zimmer, and EPA's letter response
Appendix F:	Written comments received during the public comment period