SDMS Document
92246

RECORD OF DECISION

Operable Unit 1 - Soil and Groundwater

Martin Aaron Superfund Site,

City of Camden, Camden County, New Jersey

United States Environmental Protection Agency

Region II

September 2005

DECLARATION STATEMENT

RECORD OF DECISION

SITE NAME AND LOCATION

Martin Aaron Site (EPA ID# NJD014623854)
City of Camden, Camden County, New Jersey
Operable Unit 1

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy to address contaminated soil and groundwater located on the Martin Aaron site, in the City of Camden, Camden County, New Jersey. The soil and groundwater are contaminated primarily with volatile organic compounds (VOCs) and arsenic. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for this site.

The State of New Jersey concurs with the Selected Remedy.

ASSESSMENT OF THE SITE

The response action selected in this Record Of Decision (ROD) is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances from the site into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this document represents the first and only planned remedial phase, or operable unit, for the Martin Aaron site. It addresses soil and groundwater contamination at the site.

The Selected Remedy for soils involves excavation, transportation and disposal of approximately 28,000 cubic yards of contaminated soil containing VOCs and arsenic which act as a continuing source of groundwater contamination. The excavated soil will be treated, if necessary, prior to land disposal. Residual soil contamination that remains on the site will be capped with asphalt or a similar material. The Selected Remedy for groundwater comprises groundwater collection, on-site pretreatment, with discharge of the treated water to the publicly owned treatment works (POTW).

The major components of the selected response measures include:

- excavation of approximately 28,000 cubic yards of highly contaminated soil from the arsenic and VOC source areas;
- capping of the residual soil contamination that still poses a direct contact threat;
- off-site transportation and disposal of contaminated soil and debris, with treatment of all hazardous waste prior to land disposal, as necessary;
- backfilling and grading of all excavated areas with clean fill;
- installation of groundwater extraction wells to extract and pretreat the contaminated groundwater, as necessary, prior to discharge to the local POTW;
- implementation of a long-term groundwater sampling and analysis program to assess migration and possible attenuation of the groundwater contamination over time; and,
- institutional controls, such as a deed notice, to prevent exposure to residual soils that may exceed levels that would allow for unrestricted use, and a Classification Exception Area, to restrict the installation of wells and the use of groundwater in the area of groundwater contamination.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and treatment technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

The Selected Remedy satisfies the statutory preference for treatment as a principal element of the remedy because it addresses the principal threat wastes at the site through treatment.

Part 3: Five-Year Review Requirements

This remedy will result in hazardous substances, pollutants, or

contaminants remaining on the Martin Aaron site above levels that would allow for unlimited use and unrestricted exposure. Pursuant to Section 121(c) of CERCLA, a statutory review will be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the site.

- Chemicals of concern and their respective concentrations may be found in the "Site Characteristics" section.
- Baseline risk represented by the chemicals of concern may be found in the "Summary of Site Risks" section.
- A discussion of cleanup levels for chemicals of concern may be found in the "Remedial Action Objectives" section.
- A discussion of source materials constituting principal threats may be found in the "Principal Threat Waste" section.
- Current and reasonably-anticipated future land use assumptions are discussed in the "Current and Potential Future Site and Resource Uses" section.
- A discussion of potential land use that will be available at the site as a result of the Selected Remedy is discussed in the "Remedial Action Objectives" section.
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs are discussed in the "Description of Alternatives" section.
- Key factors that led to selecting the remedy (i.e., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decisions) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

George Pavlou, Director
Emergency and Remedial Response Division
EPA - Region II

9/30/05
Date

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Decision Summary

Operable Unit 1 - Soil and Groundwater

Martin Aaron Superfund Site,

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September 2005

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SITE NAME, LOCATION AND BRIEF DESCRIPTION

The Martin Aaron site is located in the City of Camden, Camden County, New Jersey. The site includes four areas: (1) the Martin Aaron property; (2) the semi-vacant property bordering to the north referred to as the scrap-yard; (3) Comarco Foods property located adjacent to Martin Aaron to the South; and (4) various small locations adjacent to the Martin Aaron property which include the Ponte Equities property to the south and various right-of-way locations on Everett, Sixth and Jackson Streets. An overview map of the locations addressed in this ROD is shown in Appendix I, Figure 1.

The area surrounding the site is an urban mixture of industrial and residential uses, with many vacant or abandoned lots. The Martin Aaron property is currently zoned for commercial use. The property consists of a fenced 2.4-acre parcel with one remaining building formerly occupied by Rhodes Drums. The property is covered with vegetation and the remains of former building foundations.

There are no known drinking water or industrial production wells near the Martin Aaron site or the surrounding properties. Camden County Municipal Utilities Authority (CCMUA) provides sewer service to the City of Camden. Camden Water, a private contractor for the City of Camden, provides drinking water to approximately 105,000 people. The nearest Camden Water well is located approximately 1.75 miles east-northeast of the site. This well (City Well #7) is used as an emergency water supply well only.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Records indicate that the Martin Aaron property has been used for light industrial activities since, at least, 1886. Until at least 1940, various hide tanning, glazing, and related operations were performed on this and neighboring lots. In 1968, Martin Aaron, Inc., purchased the property, and is currently the owner of record. From 1968 to 1987, Martin Aaron operated a drum recycling business. In 1985, Westfall Ace Drum Company (WADCO), also known as Drum Services of Camden, began operating at the site. In addition, Rhodes Drums, Inc., also operated at the site from around 1985 until it ceased business in 1998. WADCO occupied the main on-site building (referred to as the Martin Aaron building), while Rhodes Drums operated from a smaller building in the southeastern corner of the property (known as the Rhodes Drums building). WADCO was liquidated in bankruptcy proceedings in 1994.

Martin Aaron, WADCO and Rhodes Drums would arrange for the removal of used drums from businesses for a fee and transport the

drums to the site for reconditioning. EPA has learned that the drums contained residues of material, including hazardous substances. The drums were drained of residue, pressure-washed with a caustic solution, water-washed, rinsed, steam-dried and repainted according to client specifications.

From 1981 to 1995, New Jersey Department of Environmental Protection (NJDEP) and U.S. Environmental Protection Agency (EPA) issued numerous Notices of Violations, Administrative Orders and other enforcement actions against the operators of the site. Violations included un-permitted discharges of hazardous waste, non-notification of spills or releases, improper storage of waste drums, improper waste handling and disposal, improper labeling of hazardous waste containers, hazardous waste storage violations, and others.

In 1987, NJDEP, under a search warrant issued by the Department of Law and Public Safety, collected samples from buried drums exposed in test pits, sludge from sewer basins, soils, and effluent samples. The results confirmed the presence of hazardous waste in drums and elevated levels of metals in soil above appropriate NJDEP criteria. Sludge and effluent samples from sewer basins contained elevated levels of volatile organic compounds (VOCs) and metals. Interviews with employees indicated that drum residues were allowed to drain into the ground and that drums containing wastes from the cleaning process were also buried on site. Also, NJDEP determined that a portion of the residual material generated from the drum cleaning operations drained into basins that emptied directly into the ground. Execution of the search warrant led to the indictment and conviction of one of the operators of the site, Martin Aaron, Inc. and its president, Martin Aaron, on charges of improper disposal of hazardous waste.

After the operators failed to respond to numerous directives issued by NJDEP to clean up the site, NJDEP conducted several interim remedial measures from 1995 to 1999. NJDEP removed soil, approximately 700 drums of chemical wastes, 10,000 empty drums, dumpsters filled with mixed wastes, and a few underground storage tanks (USTs). Concurrent with the NJDEP's actions, in 1998, the City of Camden demolished the Martin Aaron building, the main building used for drum reconditioning operations, because it was in danger of collapsing.

In 1997, NJDEP initiated a Remedial Investigation (RI), using state funds, for both soil and groundwater to determine the nature and extent of contamination at the Martin Aaron site. NJDEP's investigation activities included site mapping, a geophysical investigation to identify buried drums, a stability

investigation of the buildings on site, and large-scale soil and groundwater sampling. The investigation was conducted primarily at the Martin Aaron property and at the South Jersey Port Corporation (SJPC) property, located across the street to the west of the Martin Aaron property. The SJPC property was previously used by Martin Aaron as a drum storage area and its building was used for administrative purposes.

Over 160 soil borings were installed by NJDEP to identify the areal extent of soil contamination. Sampling was conducted in and around potential contaminant source and disposal areas, and in sewer basins and other areas of potential contaminant migration. Surface and subsurface soil samples were collected inside and outside of buildings on the property, in UST areas, test pits and trench excavations. Groundwater samples were collected from monitoring wells and the nearest municipal supply well.

The NJDEP RI soil results showed that both surface and subsurface soil contamination was widespread throughout the Martin Aaron property and extended beyond property lines. Contaminants detected included chlorinated and aromatic VOCs, semi-volatile organic compounds (SVOCs) consisting mostly of poly-aromatic hydrocarbons (PAHs), metals, pesticides and polycyclic-chlorinated byphenyls (PCBs). The NJDEP study also found groundwater contamination in both shallow and some of the deeper monitoring wells installed on the property.

The site was placed on the National Priorities List (NPL) in 1999, and EPA became the lead agency for the Martin Aaron site. EPA took additional removal actions, ending in 2001, to remove empty and full drums of waste that were abandoned outside the Rhodes Drums building. EPA removed 68 drums of hazardous waste, hundreds of empty drums, several buried drums, storage tanks, and a limited amount of contaminated soil and debris from the vicinity of the Rhodes Drums building. The property was also fenced to prevent trespassing.

EPA identified Martin Aaron, Inc., and Rhodes Drums as potentially responsible parties (PRPs) liable for payment of response costs for cleanup of the site. After evaluating these entities, EPA concluded that they lacked the financial resources to fund or perform the Remedial Investigation/Feasibility Study (RI/FS).

In 2003 and 2004, EPA identified a number of additional companies as PRPs for the site. These companies were customers of the operators of the drum reconditioning facilities. EPA has

notified the generators that they are considered PRPs for the site.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

Since the Martin Aaron site's placement on the NPL, EPA has worked closely with public officials and other interested community groups and concerned citizens.

On July 15, 2005, EPA released the RI/FS, the Proposed Plan, and supporting documentation for the soil and groundwater remedy to the public for comment. These documents were made available to the public in the administrative record repositories maintained at the EPA Region II office (290 Broadway, New York, New York 10007) and the Camden Free Public Library (418 Federal Street, Camden, New Jersey 08103). EPA published a notice of availability involving the above-referenced documents in the Courier-Post newspaper on July 15, 2005. The public comment period on these documents was scheduled from July 15, 2005 to August 15, 2005.

On July 26, 2005, EPA held a public meeting at the Camden County Municipal Utilities Auditorium, to inform local officials and interested citizens about the Superfund process, to discuss the findings of the RI/FS, to propose the remedial alternatives at the site, and to respond to questions from area residents and other attendees.

Due to several requests at the public meeting to extend the public comment period, EPA published a notice in the Courier-Post on August 12, 2005, extending the public comment period for an additional 30 days ending on September 14, 2005.

Responses to the comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary section of this ROD (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

This action, referred to as Operable Unit 1 (OU1), will be the only action for the site, addressing both contaminated soil and groundwater. EPA's findings indicate the presence of "principal threat" wastes at the site, primarily on the Martin Aaron property.

Concurrent with EPA's RI/FS, NJDEP and the South Jersey Port Corporation entered into discussions regarding potential remedies for the SJPC property under a separate action. After evaluating previous site uses along with EPA and NJDEP sampling results,

NJDEP concluded that the contamination at the SJPC property is more likely attributed to "historic fill" in the area than from the Martin Aaron site operations. Site records indicate that Martin Aaron, Inc., leased part of the SJPC property for drum storage and possible administrative purposes. Both EPA and NJDEP RI sampling results in areas believed to be used by Martin Aaron had similar results when compared to areas not used by Martin Aaron or the other operators. NJDEP also concluded that the contamination on the SJPC property, primarily metals and PAHs, did not appear to be a source to the groundwater contamination in the area.

Given these conditions, NJDEP, with EPA's concurrence, plans to proceed with a remedy for the SJPC property (also known as the Liedke property), independent of the Martin Aaron site. NJDEP's Technical Regulations require that if "historic fill" material is not treated or removed from a site, engineering and institutional controls shall be implemented. An engineering control (such as asphalt capping) would be required at the SJPC property prior to reuse, along with a deed notice to assure the long-term maintenance of the cap.

This ROD addresses the contaminated soils and groundwater for the Martin Aaron site and the adjacent properties previously indicated, not including the SJPC property.

SUMMARY OF SITE CHARACTERISTICS

Given the extensive NJDEP investigation, the scope of EPA's field investigations were meant to supplement the NJDEP RI data and fill data gaps. Response actions during 1999 to 2001 were performed partly in response to NJDEP's RI results, and resulted in considerable changes in conditions at the site, with the removal of known contaminated soil areas, along with USTs, above-ground tanks, piping and process equipment. In addition to documenting the conditions after the removal action, EPA's study evaluated data gaps on neighboring properties, collected data that could be used for a human health risk assessment, and supplemented the groundwater investigation performed by NJDEP.

EPA's RI included areas identified as the Martin Aaron property, the SJPC property (west of Broadway), the scrap-yard (north of the Martin Aaron property), Comarco Products (a food processing facility to the south), the Ponte Equities property (unoccupied warehouse buildings, also to the south), and various properties and right-of-ways on Everett, Sixth, and Jackson Streets.

A review of property records for this section of Camden identified large tracts that required landfilling prior to

development. The entire Martin Aaron study area was the subject of this type of landfilling, beginning in the 19th century. NJDEP and EPA site investigations identified as much as six to 10 feet of fill throughout the study area. Studies by NJDEP have attributed elevated levels of certain groups of contaminants to this type of "historic fill" and NJDEP has established remedial practices for addressing areas where "historic fill" is encountered. The EPA RI sought to identify contaminants that might be attributable to "historic fill" as distinguished from contamination problems attributable to the previous site operations.

Surface Soil Contamination

Surface soil samples were collected from 60 locations throughout the Martin Aaron and SJPC properties, the property referred to as the scrap-yard, Comarco Products, the Ponte Equities property, and on the Everett and Sixth Street rights-of-way. Laboratory results were compared to site-specific screening levels for a wide range of contaminants.

VOC contamination above screening levels was detected in the surface soil within the limits of the Martin Aaron property, but on no other properties investigated. A map of the site VOC contamination results is presented in Appendix I, Figure 2. The most frequently detected VOCs were tetrachloroethylene (PCE), trichloroethylene (TCE), and cis-1,2-dichloroethylene (cis-1,2-DCE), though a variety of different solvents were detected. This pattern is consistent with a drum reconditioning facility that would have handled liquids from a variety of unrelated operations.

SVOCs were detected at 58 of 60 surface soil sampling locations, across the entire study area. With few exceptions, the SVOCs identified in surface soils were poly-aromatic hydrocarbons (PAHs), which are frequently detected in urban soils. PAHs were generally higher on the Martin Aaron property than on other properties, with the highest concentrations in the former process and drum storage areas of the Martin Aaron operation. The earlier tannery operations would have used coal for heating and drying hides, and these same areas of the Martin Aaron property also coincide with former coal storage areas from this earlier operation. The presence of PAHs in surface soil outside of operational areas at the site appears to be associated with "historic fill" at these properties.

Metals above screening levels were detected in virtually all of the surface soil samples collected. Arsenic, barium, and lead

were detected most frequently. It is likely that metals exist at elevated levels due to the presence of "historic fill" material at the site and surrounding properties. Industrial operations on neighboring properties probably also played a factor: a glass-making company, a possible source of barium, operated on the scrap-yard property; and a lead smelter operated across Sixth Street from the site. Higher concentrations of metals, particularly arsenic, were found in suspected source areas at the Martin Aaron property, which suggests that there is also a site-related contribution of metals. Arsenic may be attributable to the drum reconditioning operations, but is also typically a remnant of tannery operations.

Pesticides were infrequently detected in the study area. PCBs were detected above screening levels in only four surface soil samples ranging from 2 to 19 parts per million (ppm).

During the EPA RI, EPA conducted field screening for radiation for surface and subsurface soil. Field screening results were negative for radiation, therefore, no further analysis was performed for radioactive compounds.

Subsurface Soil Contamination

Subsurface soil samples were collected at 72 sampling intervals at depths ranging from greater than two feet below ground surface (bgs) to approximately 21 feet bgs.

For subsurface soil, VOCs were detected almost exclusively on the Martin Aaron property. Similar to the surface soil results, 14 different VOCs were detected in subsurface soil, though few with any frequency (PCE was the most frequently detected). For example, PCE (with a screening level of 0.06 ppm) was detected with a level of 110 ppm near a location where the former Martin Aaron building existed. At a different location near the middle of the Martin Aaron property, TCE (with a screening level of 0.06 ppm) was found at 630 ppm, and PCE was not detected. These areas were found at between four and seven feet bgs. The results suggest that drum reconditioning operations contributed to VOC contamination in subsurface soil at different locations on the property.

SVOCs were identified above screening levels at the Martin Aaron property, in the rights-of-way on Everett Street and Sixth Street, and on the SJPC property. As with the surface soils, the SVOCs detected most frequently in subsurface soil were PAHs that have also been associated with "historic fill." There is some correlation between SVOC concentrations and, for instance, the

Martin Aaron building VOC area on the Martin Aaron property. Elevated SVOCs were identified in the northeastern corner of the SJPC property. The results suggest that SVOCs migrated to subsurface soils as a result of operations at the Martin Aaron site and, possibly, from other sources, as well as contributions from the presence of fill material at these properties.

Metals were found on all properties sampled and at most sampling locations. Metals above screening levels include: antimony, arsenic, barium, cadmium, chromium, lead, mercury, selenium and thallium. The metals appear to be attributable to "historic fill" material or possibly from other sources at these sampling locations, with the exception of arsenic, which appears at concentrations as high as 23,300 ppm near the Martin Aaron building. By contrast, several of the highest concentrations of lead, the most frequently detected metal, were found across Sixth Street in the right-of-way, near the former smelting facility.

Pesticides were infrequently detected in subsurface soil and pesticide concentrations were relatively low (i.e dieldrin was detected in the range of 0.006 to 0.69 ppm). PCBs were also infrequently detected above screening levels. PCBs had been detected with more frequency in NJDEP's RI, but it appears that the 1999-2000 removal actions substantially addressed site PCBs.

The Rhodes Drum Building

The one building still remaining on the Martin Aaron property, referred to as the Rhodes Drums building, is actually part of a larger one-story structure that is primarily situated on the neighboring Ponte Equities property. This one-story building, along with another much taller building on the Ponte Equities property, are currently unoccupied. Rhodes Drums apparently used the smaller section situated on the Martin Aaron property for its drum recycling operations. The original one-story building (situated across the property line of the Martin Aaron and Ponte Equities properties) was most likely built by the Castle Kid Company as part of their tanning operations in the early 1900s. Since that time, the buildings on the Ponte Equities property are known to have been used as a book bindery and as a warehouse.

A safety inspection determined that it would be unsafe to perform sampling activities inside the Rhodes Drums building. NJDEP's earlier investigation of the Rhodes Drums building identified soil contamination in excess of NJDEP soil cleanup criteria. The soil contamination found included VOCs, PAHs, metals, and pesticides/PCBs. EPA soil sampling results adjacent to the Rhodes Drums building support NJDEP findings.

For the other two structures on the Ponte Equities property, no sampling was performed because the potential connection to earlier tannery operations was not known until well after the completion of the RI field work. Additional investigations on and around these buildings will be necessary to determine if the tanning operations resulted in contamination of the one-story Ponte Equities building.

Groundwater Contamination

In order to evaluate hydrogeologic conditions and groundwater quality beneath the site, a total of 24 monitoring wells were installed as part of EPA's RI. An additional 10 wells from the NJDEP RI were also sampled. Two rounds of groundwater sampling were conducted in June and September of 2002. In addition, a city water supply well (City Well #7) was also sampled.

The groundwater table is generally found about four to seven feet bgs. Below the fill at the site, the hydrogeology is made up of several layers of the Potomac-Raritan-Magothy (PRM) aquifer, which is composed of layers of gravel, sand, silt and clay. The Upper and Middle PRM aquifers were investigated as part of this study. A number of the monitoring wells were placed at or near the water table, within the first 20 feet bgs, and are considered "shallow" wells. Site groundwater monitoring wells were also placed within the first 100 feet bgs, or within the Upper PRM Aquifer. The Upper PRM Aquifer is a sand and gravel layer that is separated from deeper units by less conductive clay/silt lenses. A few monitoring wells were also installed to approximately 180 feet bgs, in the Middle PRM Aquifer. Groundwater at the site generally moves to the southeast, influenced by municipal pumping wells.

Groundwater samples were analyzed for VOCs, SVOCs, metals, and PCBs. A map of the site groundwater contamination results is presented in Appendix I, Figure 3. VOC contamination in the "shallow" wells is primarily limited to within the Martin Aaron property boundary. As with VOC-contaminated soils, 12 different VOCs were detected, led by cis-1,2-DCE, benzene, TCE and PCE. Of the highest concentrations detected, cis-1,2-DCE was found as high as 330 parts per billion (330 ppb) and benzene as high as 31 ppb. While many metals were detected above screening levels in the "shallow" wells, only arsenic, detected as high as 7,130 ppb, appears to be site-related.

In the Upper PRM Aquifer wells, which were screened between 30 and 60 feet bgs, VOCs detected above screening levels include cis-1,2-DCE, TCE, vinyl chloride, dichloropropane, and benzene.

VOCs were primarily identified in groundwater samples collected from the Martin Aaron property, with a trend of groundwater contamination moving to the southeast, consistent with the direction of groundwater flow. Groundwater VOC contamination near the Martin Aaron building is elevated but substantially lower (i.e. cis-1,2-DCE at 37 ppb) at this depth. Arsenic was also found at this depth, though at substantially lower concentrations than in the shallow wells.

In wells from deeper units (more than 100 feet bgs), specific VOCs identified as TCE and vinyl chloride were detected at 1.1 ppb and 6.1 ppb, respectively, which are considered relatively low concentrations. Sampling results of City Well #7, screened at 123 feet bgs, determined that it is not affected by the Martin Aaron site contamination.

Based on groundwater data collected from the RI, a VOC plume, comprised of cis-1,2-DCE, TCE, PCE and several other constituents, covers the entire footprint of the Martin Aaron property and extends several hundred feet beyond the property boundary. The extent of the plume appears to be an area over 1,000 feet long and approximately 600 feet wide in the shallow wells (within the first 20 feet bgs). The plume narrows with depth to approximately 400 feet wide in Upper PRM Aquifer wells at depths of 30 to 60 feet bgs. Vertically, the deepest contamination was found within a confining unit at the base of the Upper PRM Aquifer (approx. 110 feet bgs). The confining unit consists of thin sand and clay layers, and wells installed in these sand layers exhibited the deepest, albeit relatively low VOC concentrations.

A smaller arsenic groundwater plume exists in the shallow aquifer, with arsenic concentrations decreasing with depth. The areal extent of the arsenic plume appears to align closely with the dimensions of the Martin Aaron property.

As previously mentioned regarding radiation screening, EPA did not conduct field screening for radiation in groundwater during this RI. However, during a previous EPA RI for the nearby Welsbach/General Gas Mantle Superfund site, EPA collected groundwater samples from monitoring wells located on the Martin Aaron property for radionuclide analysis. The radionuclide concentrations in the groundwater samples were found to be below drinking water standards.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Site Uses: Prior to the start of the OU1 remedy, the Martin Aaron property was abandoned and fenced off. The Martin Aaron property and the neighboring lots are zoned for industrial use, similar to the current use of neighboring, occupied commercial properties. In discussions with a member of the City of Camden Department of Development and Planning, Division of Planning Office, as well as supporters of the Waterfront South redevelopment project, EPA has been advised that the Martin Aaron property is zoned for economic redevelopment and light industrial usage. Furthermore, Camden expects that the future use of this area will be integrated into the long-range city plans, which might involve some commercial land-use such as a green-market or commercial gas station. In either case, residential re-use is not contemplated.

Ground and Surface Water Uses: Groundwater underlying the site is considered by New Jersey to be Class II-A, a source of potable water; however, no complete exposure pathways to contaminated groundwater are known. All residents in the area of the Martin Aaron site are currently on city-supplied water. If contaminated groundwater is used as drinking water in the future, significant health risks would exist.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the human health risk which could result from the contamination at the site if no remedial action were taken.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* - identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of effect (response). *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity

assessments to provide a quantitative assessment of site-related risks.

EPA conducted a baseline risk assessment to evaluate the potential risks to human health and the environment associated with the Martin Aaron Superfund site in its current state. Although the risk assessment evaluated many contaminants and several of the potential source areas, the conclusions of the risk assessment indicate that the significant risks are limited to arsenic and benzo[a]pyrene in the soils at the Martin Aaron property, arsenic in the soils of the scrap yard and the properties adjacent to the Martin Aaron property, and arsenic and vinyl chloride in the groundwater of the Upper PRM aquifer. This section of the decision summary will focus on the risks associated with these contaminants in these media. A summary of the concentrations of the contaminant of concern in sampled matrices is provided in Appendix II, Table 1.

EPA's baseline risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the site under current and future land use and groundwater use conditions. Future use of the site and the properties adjacent to the site are likely to be commercial/industrial, based on historical land use, current zoning, and future plans for redevelopment. Therefore, exposure to surface and subsurface soils on the Martin Aaron property, the scrap yard area, and the properties adjacent to the Martin Aaron property were evaluated for trespassers, commercial/industrial workers, and construction workers. Groundwater exposures were assessed for future use scenarios assuming that the groundwater would be used as a drinking water. For all media, the reasonable maximum exposure, which is the greatest exposure that is likely to occur at the site, was evaluated.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and non-carcinogenic (systemic) effects due to exposure to site chemicals are considered separately. Consistent with EPA guidance, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and non-carcinogenic risks associated with exposures to individual compounds of concern were summed to indicate the potential risks associated with mixtures.

Non-carcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intake and safe levels of intake (reference doses). Reference doses (RfDs) have been developed by EPA for indicating the potential

for adverse health effects. RfDs, which are expressed in units of milligrams per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (*e.g.*, the amount of a chemical incidentally ingested from contaminated soil) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is derived by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

An HI greater than 1 indicates that the potential exists for non-carcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The toxicity values, including reference doses for the contaminants of potential concern at the site, is presented in Appendix II, Table 2.

The non-carcinogenic hazard indices (HI) that exceed EPA's acceptable level are presented in Appendix II, Table 4. At the Martin Aaron property, HI values for current/future adolescent trespassers exposed to surface soils are estimated to be 3.9, while the HI values for current/future commercial/industrial workers exposed to both surface and subsurface soils are 3.7 and 8.2, respectively. For the scrap yard area, an unacceptable HI value of 5.6 is estimated for the current/future commercial/industrial worker exposed to subsurface soils. Current/future commercial/industrial workers in the properties adjacent to the Martin Aaron property are estimated to have HI values of 2.7 for the surface soils and 2.9 for the subsurface soils. The non-cancer hazard index for workers exposed to groundwater as a drinking water source is 130. In all scenarios, arsenic is the risk driver.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of potential concern. Cancer slope factors (SFs) have been developed for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, 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 generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF values used in this risk

assessment for arsenic, benzo[a]pyrene, and vinyl chloride are presented in Appendix II, Table 3.

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable. This level indicates that an individual has not greater than approximately a one in ten thousand to one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at a site. Excess lifetime cancer risks estimated at this site are presented in Appendix II, Table 5. At the Martin Aaron property, the excess lifetime cancer risk estimated for exposure to surface soils by the current/future adolescent trespasser, the current/future commercial/industrial worker, and the construction worker are 2.3×10^{-4}, 6.0×10^{-4}, and 3.8×10^{-4}, respectively, while the excess lifetime cancer risk for construction workers exposed to subsurface soils at the Martin Aaron property is 6.3×10^{-4}. Arsenic and benzo[a]pyrene are the risk drivers at the Martin Aaron property. In the scrap yard area, current/future commercial/industrial workers are estimated to have an excess lifetime cancer risk of 2.5×10^{-4} and 7.9×10^{-4} for exposure to surface and subsurface soil respectively. The cancer risks estimated for current/future commercial/industrial workers exposed to surface and subsurface soils at the properties adjacent to the Martin Aaron property are 3.3×10^{-4} and 3.5×10^{-4}, respectively. For each of these risk estimates, arsenic is the risk driver.

Exposure to groundwater as a potable supply yields an excess lifetime cancer risk of 1.9×10^{-2} for workers, with arsenic and vinyl chloride as the risk drivers. All of these are above the NCP's acceptable risk range. The calculations were based on reasonable maximum exposure scenarios. These estimates were developed by taking into account various conservative assumptions about the likelihood of a person being exposed to these media.

For vapor intrusion associated with the Martin Aaron site, EPA found that the concentrations of VOCs in the groundwater are at levels that could potentially result in exposures to indoor vapors under certain conditions. However, EPA found the highest concentrations in VOCs in the groundwater are concentrated in the center of the site where there are no buildings currently in existence. EPA concluded that there is not an immediate threat to public health in the environment from the vapor intrusion pathway.

Ecological Risks

A four-step process is utilized for assessing site-related ecological risks for a reasonable maximum exposure scenario: *Identification of Chemicals of Concern* - a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study. *Exposure Assessment* - a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations. *Ecological Effects Assessment* - literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors. *Risk Characterization* - measurement or estimation of both current and future adverse effects.

Screening Level Ecological Risk Assessment (SLERA) results indicate the presence of contaminants of potential concern in the Martin Aaron property surface soils. Potential risks were indicated to terrestrial plants and wildlife, and soil invertebrates from direct exposure to PAHs, inorganic chemicals, several pesticides, PCBs, and VOCs. Several VOCs and inorganic chemicals in groundwater were detected at concentrations exceeding ecological screening values, suggesting they could represent a potential risk to ecological receptors if they were to discharge to surface water. However, chemicals in groundwater could represent a potential risk to ecological receptors only if they discharge to a viable aquatic habitat and this pathway has not been established. Therefore, due to the small potential to adversely affect aquatic life and groundwater does not warrant further consideration. Further consideration of these potential ecological risks may be warranted; however, it should be noted that habitats on the Martin Aaron Property have been highly disturbed by past activities and provide only very limited viable habitat for ecological receptors.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement

- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the site, and is highly unlikely to underestimate actual risks related to the site.

More specific information concerning public health and environmental risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the risk assessment report.

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

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The following remedial action objectives for contaminated soil and groundwater address the human health risks and environmental concerns at the Martin Aaron site:

- Reduce or eliminate the direct contact threat associated with contaminated soil to levels protective of a commercial or industrial use, and protective of the environment;

- Prevent erosion and off-site transport of contaminated soils;

- Reduce or eliminate the migration of site contaminants from soil to groundwater;

- Prevent public exposure to contaminated groundwater that presents a significant risk to public health and the environment;

- Remediate groundwater to the extent practicable and minimize further migration of contaminants in groundwater;

- Restore the groundwater to drinking water standards within a reasonable time frame; and,

- Minimize or eliminate organic vapor migration from groundwater into future indoor environments that may be built on the site.

This action will reduce the direct contact excess cancer risk associated with exposure to contaminated soils to one in one million for commercial/industrial use of the site. This will be achieved by reducing exposure to the concentrations of the soil contaminants to the target levels indicated in Appendix II, Table 6 in surface soil (soil within the first two feet of ground surface). Because there are no promulgated Federal or State cleanup standards for soil contamination, EPA established these targets, or Cleanup Goals, based upon the baseline risk assessment. Targets were selected that would both reduce risk associated with exposure to soil contaminants to an acceptable level and ensure minimal migration of contaminants off the site.

EPA has identified arsenic as a principal threat at the site. EPA evaluated the level of arsenic contamination that is more likely to be attributable to "historic fill," which was found at a range of less than 20 ppm to as high as 339 ppm on and off the site, and concluded that soils contaminated with arsenic at concentrations greater than 300 ppm are probably associated with both the tannery and the drum reconditioning operations that took

place at the site, and concentrations less than 300 ppm are more typical of "historic fill." An arsenic groundwater plume is also centered on the Martin Aaron property, and the high arsenic contamination levels in soils are probably exacerbating these conditions. Appendix II, Table 6 identifies 20 ppm as a direct-contact Cleanup Goal for arsenic. Appendix II, Table 6 also identifies arsenic Source Areas on Martin Aaron to be soils with arsenic concentrations greater than 300 ppm. Consistent with the NCP, the Feasibility Study evaluated treatment alternatives to address these Source Areas, which are considered principal threats. Because some deeper soils, down to an estimated 10 feet below ground surface, are contaminated with VOCs at levels that act as continuing sources of groundwater contamination, this action will reduce this threat by remediating contaminated soils in excess of 1 ppm total VOCs. EPA has determined that the presence of VOCs in soil is closely linked to Martin Aaron site activities.

Based upon communications with the City and other interested parties, reuse expectations for the Martin Aaron property and neighboring properties are for commercial redevelopment. Of the adjacent properties, only Comarco Products is currently in active use.

As with NJDEP's assessment of the SJPC property, EPA's investigation identified contamination in a number of areas nearby the Martin Aaron property that is consistent with "historic fill" and does not appear to be the result of contaminant releases from the Martin Aaron Superfund site. These areas include the rights-of-way on Everett and Sixth Streets, and a majority of both Comarco Products and Ponte Equities properties. Soil contamination on the Martin Aaron property, the nearby scrap-yard property, and a few areas located on Comarco Products and Ponte Equities properties appear to be attributable to the Martin Aaron Superfund site.

Consequently, EPA has developed direct-contact Cleanup Goals, identified in Appendix II, Table 6, that are appropriate for the Martin Aaron site that would be protective under a future-use commercial redevelopment scenario. These direct-contact Cleanup Goals would also be protective for commercial redevelopment of other neighboring properties; however, they would not be appropriate for an unrestricted future residential use of remediated properties.

There are currently no complete exposure pathways to contaminated groundwater beneath the Martin Aaron site because there are no known contaminated wells in use. All residents in the area of

the Martin Aaron site are currently on city-supplied water. If contaminated groundwater is used as drinking water in the future, significant health risks would exist. In addition, if the contaminated groundwater were used in industrial processes within the area, significant human health risks may exist. Finally, vapor intrusion into new or existing structures is a potential exposure pathway from VOCs in groundwater. Thus, remedial actions must minimize the potential for human exposure to contaminated groundwater.

Groundwater within the source area must be remediated to the extent practicable. The presence of clay and silt stringers within the uppermost water bearing zone and high contaminant concentrations in groundwater (specifically of arsenic), make it difficult to restore groundwater to the MCLs or the New Jersey groundwater quality concentrations (GWQCs) in the foreseeable future, even with active remediation of groundwater. Given these uncertainties, this action will, at a minimum, prevent further migration of contaminants to groundwater outside the Source Areas.

Appendix II, Table 7, lists the contaminants of concern found in groundwater at the site, and their respective Cleanup Goals, in this case the drinking water standards (MCLs) or GWQCs. Cleanup Goals were selected that would both reduce the risk associated with exposure to contaminants to an acceptable level and ensure minimal migration of contaminants off the site.

DESCRIPTION OF ALTERNATIVES

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that each remedial alternative be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery technologies to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility or volume of hazardous substances.

Remedial alternatives for the Martin Aaron site are presented below. The soil and groundwater contamination at the site are expected to be addressed sequentially under a joint remedial approach. The costs for remedial alternatives are presented separately for each media.

CERCLA requires that if a remedial action is selected that results in hazardous substances, pollutants, or contaminants

remain at the site above levels that allow for unlimited use and unrestricted exposure, EPA must review the action no less often than every five years after initiation of the action. In addition, institutional controls in the form of a deed notice to limit the use of portions of the property may be required, to ensure that future site activities are performed with knowledge of the site conditions, that appropriate health and safety controls would be in place, and, that unrestricted use of the property would not be allowed. The type of restriction and enforceability may need to be determined after completion of the remedial alternatives selected in the ROD. Consistent with expectations set out in the Superfund regulations, none of the remedies rely exclusively on institutional controls to achieve protectiveness. The time frames below for construction do not include the time for remedial design or the time to procure contracts.

Common Elements for Soil Alternatives

Several of the soil alternatives include common components. Alternatives S2 through S6 include the demolition of the Rhodes Drums building (the section located on the Martin Aaron property). Demolition of this building is expected because site contamination has been previously found under the building, and because its poor structural condition could limit the ability to safely remediate other areas of the site. Less is known about the adjoining one-story Ponte Equities building, which may also reside on top of site contamination from its years as part of tannery operations, and may also be found structurally unsound while remediation occurs on the Martin Aaron site. Further studies in remedial design will assess the one-story Ponte Equities building.

The active remedies address surface soil contamination through capping (Alternatives S2 through S6) or excavation and off-site disposal (Alternatives S4, S5 and S6). Alternatives S3 through S6 address principal threat waste (VOC- and arsenic-contaminated soil at concentrations exceeding the Source Area Cleanup Goals) through a combination of different treatment technologies or excavation and off-site disposal.

Since all the soil alternatives result in hazardous substances, pollutants, or contaminants remaining on site above levels that would not allow for unlimited use and unrestricted exposure, a review of the site at least every 5 years would be required.

SOIL ALTERNATIVES

Alternative S1: No Action

Estimated Capital Cost:	*$0*
Estimated Annual O&M Cost:	*$0*
Estimated Present Worth Cost:	*$0*
Estimated Construction Time frame:	*None*

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action at Martin Aaron or the surrounding properties to prevent exposure to the soil contamination and the contaminated soil would be left in place. Existing temporary measures (i.e., limited access through fencing) would provide limited protectiveness, but they would not be monitored or maintained.

Redevelopment of Martin Aaron would pose a high risk of direct contact exposure to construction workers and future users, and may exacerbate off-site contaminant migration.

Alternative S2: Capping and Institutional Controls

Estimated Capital Cost:	*$2,970,000*
Estimated Annual O&M Cost:	*$18,500*
Estimated Present Worth Cost:	*$3,310,000*
Estimated Construction Time frame:	*2 months*

Under this alternative, the areas of contaminated soil exceeding the direct-contact Cleanup Goals would be capped to prevent direct contact with the soil contamination. Capping would limit groundwater infiltration through the source areas, reducing the rate of contaminant migration out of the VOC and arsenic Source Areas. Asphalt capping has been specified, for cost-estimation purposes, though a redevelopment plan including a combination of building foundations and other ground covers could be designed that would be protective.

Demolition of the existing Rhodes Drums building at the site would be conducted since soil contamination extends up to the building walls and is believed to extend beneath the building. Further contaminant and structural evaluations performed during remedial design would determine whether other portions of the one-story Ponte Equities building would also need to be demolished.

Institutional controls would consist of land use restrictions that would prevent disturbance of and assure the maintenance of the cap. A deed notice prepared in accordance with the NJDEP Technical Requirements for Site Remediation would need to be placed on the affected properties identifying the areas of soil with contamination, and the areas with site-specific engineering controls. As part of redevelopment plans, properties would also have a requirement for VOC vapor controls for newly constructed buildings.

Alternative S2 only passively addresses principal threats through capping, and would need to be coupled with an active groundwater remedy to satisfy the remedial action objectives.

Alternative S3: Solidification of Arsenic Source Areas, Soil Vapor Extraction of VOC Source Areas, and Capping

Estimated Capital Cost:	*$3,240,000*
Estimated Annual O & M Cost (0-2 yrs):	*$125,900*
Estimated Annual O & M Cost (3-50 yrs):	*$8,800*
Estimated Present Worth Cost:	*$3,630,000*
Estimated Construction Time frame:	*2.5 years*
Estimated O & M Time frame for SVE:	*2 years*

This alternative consists of a combination of treatment technologies to address the Source Areas, coupled with capping. In order to address the VOC-contaminated soil, this alternative includes installation of a soil vapor extraction (SVE) system. In addition, this alternative calls for the stabilization of soil with concentrations of arsenic over 300 ppm, through the addition of a concrete mixture into the soil.

The volume of soil containing VOCs to be treated with SVE is estimated at 12,150 cubic yards and the volume of soil containing arsenic to be stabilized is approximately 16,000 cubic yards; however, in some cases, the VOC Source Areas and the arsenic Source Areas overlap on the site. While stabilization has been successful in treating VOC-contaminated soil at some sites, SVE cannot be used to treat arsenic contamination. In addition, stabilization can be performed in one construction step, whereas SVE involves the installation and operation of an in-ground system over a number of months or years. Under this alternative, stabilization would be performed first, including areas where arsenic and VOCs are co-located, followed by SVE in remaining areas with only VOC contamination. The O&M time frame estimated (above) is for the expected operation period of the SVE system.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils, including the treated soils, similar to Alternative S2. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap and to prevent disturbance of the stabilized soil.

Alternative S4: Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils

Estimated Capital Cost:	*$6,400,000*
Estimated Annual O & M Cost (30 years):	*$8,800*
Estimated Present Worth Cost:	*$6,580,000*
Estimated Construction Time frame:	*5 months*

This alternative includes excavation of as much as 28,000 cubic yards of both the VOC and arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary to allow for land disposal. The unexcavated portions of the Martin Aaron site, an area of approximately 2.0 acres where soils exceed the direct-contact Cleanup Goals, would be capped as presented in Alternatives S2 and S3. This alternative meets the remedial objectives by removing highly contaminated soils that are considered principal threat wastes, and by eliminating contact with the remaining soil contamination by capping. If the excavated soil exhibits hazardous characteristics as defined by the Resource, Conservation and Recovery Act (RCRA) treatment would be required prior to disposal to meet the RCRA Land Disposal Requirements (LDRs). For cost estimating purposes, the FS assumed 30 percent of the excavated soil would undergo treatment prior to disposal.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils, including the treated soils, similar to Alternative S2. Excavated areas would be backfilled with clean fill. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap.

Alternative S5: Excavation and Off-site Transportation of Arsenic Source Areas with Treatment as necessary prior to Land Disposal, Treatment of VOC Source Areas via Soil Vapor Extraction, Capping Residual Soils

Estimated Capital Cost:	*$5,800,000*
Estimated Annual O & M Cost (0-2 yrs):	*$125,900*
Estimated Annual O & M Cost (3-50 yrs):	*$8,800*
Estimated Present Worth Cost:	*$6,190,000*
Estimated Construction Time frame:	*2.5 years*
Estimated O & M Time frame for SVE:	*2 years*

This alternative includes excavation of the arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary prior to disposal, if required by the RCRA LDRs. In addition, the remaining VOC Source Areas would be addressed through the installation of an SVE system, as described in Alternative S3. The O&M time frame estimated (above) is for the expected operation period of the SVE system.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils that exceed the direct-contact Cleanup Goals, similar to Alternative S2. Excavated areas would be backfilled with clean fill. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap.

Alternative S6: Excavation and Off-site Transportation of Residual Soils and Source Areas with Treatment as necessary prior to Land Disposal, Engineering Controls

Estimated Capital Cost:	*$8,300,000*
Estimated Annual O & M Cost:	*$0*
Estimated Present Worth Cost:	*$8,300,000*
Estimated Construction Time frame:	*8 months*

Alternative S6 would result in the excavation of all contaminated soils within the Source Areas and all contaminated soils exceeding the direct-contact Cleanup Goals. The depth of excavation varies from two feet to an estimated maximum depth of about 10 feet. The area of excavation would encompass a majority of the Martin Aaron property and on surrounding properties, resulting in excavation of approximately 64,500 cubic yards. Similar to Alternative S4, Source Area soils would be treated, as necessary, prior to land disposal to satisfy the RCRA LDRs.

This alternative also includes the demolition of the Rhodes Drums building. Because the site Cleanup Goals are protective for a commercial end-use, but not for unrestricted use, this alternative would not allow for unrestricted future use in some portions of the site. In that case, institutional controls similar to those described in Alternative S2 would be needed to assure the protectiveness of the remedy.

Common Elements for Groundwater Alternatives

Performance of the four active groundwater remedial alternatives would be greatly enhanced by an active soil remedy to address the soil Source Areas, which would substantially reduce both the volume of principal threat wastes at the site and groundwater contaminant contribution. None of the groundwater alternatives are expected to fully remediate the groundwater without an active soil remedy.

All active groundwater alternatives require a long-term monitoring program to assess effectiveness and to monitor any migration of contamination over time. While the zone of contaminated groundwater is not currently in use, and no water supplies are threatened, the active remedies (Alternatives GW2 through GW5) would require institutional controls such as a Classification Exception Area (CEA) to restrict use of the groundwater until remediation goals are achieved.

Since all the groundwater alternatives result in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

GROUNDWATER ALTERNATIVES

Alternative G1: No Action

Estimated Capital Cost:	*$0*
Estimated Annual O&M Cost:	*$0*
Estimated Present Worth Cost:	*$0*
Estimated Construction Time frame:	*None*

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to prevent exposure to the groundwater contamination. Institutional controls would not be implemented to restrict future groundwater use.

If no soil or groundwater action is taken, groundwater contamination will persist above the remediation goals, and the plume may expand over time. If an active soil remedy addresses the source areas, but no groundwater action is taken, VOC and arsenic plumes would still persist for a number of years (roughly estimated at over 50 years).

Alternative G2: Monitored Natural Attenuation (MNA) and Institutional Controls

Estimated Capital Cost:	*$23,925*
Estimated Annual O & M Cost (0-2 yrs):	*$207,418*
Estimated Annual O & M Cost (3-50 yrs):	*$25,927*
Estimated Present Worth Cost:	*$550,000*
Estimated Construction Time frame:	*0 years*

Alternative G2 relies on natural attenuation to address the groundwater plume while placing use restrictions on the area of groundwater exceeding the Cleanup Goals until groundwater returns naturally to acceptable levels. Alternative G2 relies on remediation of the soil Source Areas (through the selection of an active soil remedy) and cannot satisfy the remedial action objectives alone.

Studies performed during the RI indicate that natural attenuation of VOCs is probably underway. Natural attenuation is a process by which contaminant concentrations are reduced by conditions already present in the groundwater, such as volatilization, dispersion, adsorption, and biodegradation. VOC contamination is amenable to natural attenuation under certain conditions, some of which appear to exist at the site. These natural degradation processes may decrease VOC contaminant concentrations over time, especially if an active soil remedy is undertaken to address VOC Source Areas. The prospects for natural mechanisms to decrease the concentration or mobility of arsenic in groundwater are very limited, though a soil remedy addressing arsenic Source Areas would improve groundwater conditions.

Under this alternative, a soil remedial alternative that either treats or removes the soil Source Areas would minimize further contaminant contribution to the plume, thus substantially decreasing the time until natural attenuation achieves the remedial goals. The main remedial components of this alternative include groundwater use restrictions and monitoring. Institutional controls, such as a CEA, would be implemented. The components of the CEA include the location of the restriction (including areas of potential migration before degradation reduces contaminant concentrations to below applicable cleanup

goals), the compounds detected over the applicable cleanup goals, and the proposed duration of the restriction. This control would restrict future use of the groundwater within the area over the duration of the CEA.

Alternative G2 would require a monitoring program, which would establish a set of groundwater conditions that would be expected to be met over time, if natural attenuation is succeeding. If monitoring of the groundwater contamination indicates that natural attenuation would not achieve the remediation goals, active restoration with one of the other alternatives, G3, G4, or G5 presented later, would be implemented.

Alternative G3: Containment with Hydraulic Controls

Estimated Capital Cost:	*$1,600,000*
Estimated Annual O&M Cost:	*$580,000*
Estimated Present Worth Cost:	*$7,800,000*
Estimated Construction Time frame:	*3 months*

The objective of Alternative G3 is to intercept the contaminated groundwater using a series of extraction wells along the downgradient edge of the contamination to control the off-site migration of the plumes. This alternative would meet the remedial objectives by preventing downgradient migration of the plume and protection of any receptors, and eventual capture of the plume.

The alternative would consist of extraction wells, pretreatment of arsenic and VOC contamination, and discharge to the POTW (i.e., the Camden County Municipal Utilities Authority, CCMUA). The groundwater use restrictions are the same as described for Alternative G2, and a monitoring program would also be required.

While the lateral extent of the contamination extends to approximately 125 feet bgs, the bulk of the contamination is within 50 feet of the ground surface. Active pumping to a depth of approximately 50 feet is expected to contain the portion of the plume that has the highest potential to migrate. For cost estimation purposes, the FS assumed that three extraction wells along the downgradient edge of the plume, pumping at a combined 20 gallons per minute (20 gpm), would contain the plume. Because the arsenic and VOC plumes migrate at different rates, additional extraction wells could be installed within the arsenic plume to also control the migration of the arsenic plume.

If coupled with an active source control remedy for the soils, preliminary calculations estimate a time frame of 20 years to completely remediate the aquifer.

Alternative G4: Geochemical Fixation and MNA

Estimated Capital Cost:	*$1,200,000*
Estimated Annual O&M Cost:	*$26,000*
Estimated Present Worth Cost:	*$1,700,000*
Estimated Construction Time frame:	*6 months*

Alternative G4 includes geochemical fixation to address the arsenic-contaminated groundwater, along with MNA (similar to Alternative G2) to address the VOCs. Geochemical fixation involves introducing a polymer into an area with high arsenic concentrations. This particular process entails the mechanical mixing of an estimated 64,000 cubic yards of soil over the course of a number of months. The chemical process transforms metal contaminants to low-solubility precipitates. The conversion of contaminants to low-solubility precipitates eliminates their mobility and prevents them from being drawn into water wells if any wells were installed at the site in the future. At Martin Aaron, polymers would be introduced to a depth of approximately 15 to 20 feet. This depth includes the shallow aquifer and an underlying clay layer where the arsenic concentrations appear to be highest. A pilot study to evaluate methods of distributing chemicals and the resulting effectiveness would be required prior to full scale injection.

The groundwater use restrictions and MNA are as described in Alternative G2. This alternative would also include long-term monitoring to assess the effectiveness of the remedy. If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer.

Alternative G5: Groundwater Collection and Treatment

Estimated Capital Cost:	*$1,700,000*
Estimated Annual O&M Cost:	*$700,000*
Estimated Present Worth Cost:	*$6,600,000*
Estimated Construction Time frame:	*3 months*

The objective of Alternative G5 is to aggressively remediate the contaminated groundwater plume by extraction and treatment of all of the contaminated groundwater, with discharge of the treated water to the CCMUA. The groundwater extraction and treatment system would consist of extraction wells, on-site pretreatment

(assumed, for cost-estimating purposes, to be a combination of air-stripping and vapor-phase carbon to address the VOCs and chemical precipitation to address metals), and discharge to the POTW. The extraction wells would be placed in the contaminated portions of the plume to depths of approximately 50 feet, pumping at a combined rate of 85 gpm. In order to determine if chemical precipitation would be necessary, contaminant concentrations were estimated for the collection system discharge and compared against the CCMUA pretreatment limits. Arsenic was the only groundwater contaminant that may exceed the limits. Based on this evaluation, arsenic removal with chemical pretreatment would be needed prior to discharge to CCMUA. The groundwater use restrictions and monitoring of groundwater are as previously described in Alternative G2.

If combined with an active soil remedy to address the Source Areas, it has been estimated that this system would be operated for 10 years to restore the aquifer.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria.

Threshold Criteria *- The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

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1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Soils

The no action alternative is not protective because it does not prevent direct contact with site soils and allows continued leaching of VOCs and metals to groundwater.

Alternatives S2 through S6 are all considered protective of human health because they all prevent direct contact with contaminated soils in excess of the direct contact Cleanup Goals. Because the direct-contact Cleanup Goals are appropriate for commercial or industrial uses, but not for unrestricted use, the implementation of institutional controls such as a deed notice would be required for any of the active remedies to assure protectiveness over the long term. Alternative S2 relies primarily on capping and institutional controls to meet the remedial action objectives, and does little on its own to address the arsenic and VOC Source Areas.

Groundwater

The no action alternative is not considered protective because it does nothing to prevent exposure to contaminated groundwater in the future, which would result in unacceptable future risks.

The remaining alternatives are considered protective. Alternative G2 (MNA and Institutional Controls) is considered protective because it includes restrictions on the use of groundwater and includes groundwater monitoring to evaluate natural attenuation and ensure that the plume does not migrate to areas that would result in human exposure. Alternatives G3 through G5 also meet the threshold of preventing human exposure. Alternatives G3, G4, and G5 take differing approaches to controlling or remediating the groundwater contamination; however, none of these alternatives are expected to remediate the groundwater without the aid of a complimentary soil remedy that addresses the soil Source Areas.

All alternatives except the "no action" alternative would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment, or through engineering or institutional controls.

2. Compliance with applicable or relevant and appropriate requirements (ARARs)

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are

collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for a invoking waiver.

Soils

There are no chemical-specific ARARs for the contaminated soil. The Cleanup Goals are risk-based for the surface soils, and are similar to NJDEP's non-residential direct contact soil criteria. In addition, NJDEP has developed Impact to Groundwater Soil Cleanup Criteria to address sources of groundwater contamination in deeper soils, and EPA considered these criteria in developing the Source Area Cleanup Goals for this site. Alternative S2 relies on capping to address the direct contact Cleanup Goals, and Alternative S6 relies on excavation. Alternatives S3, S4, and S5 rely primarily on capping to achieve the direct contact Cleanup Goals.

Alternative S2 does little to meet the source control Cleanup Goals, besides some reduction in surface water infiltration that would reduce contaminant mobilization. Alternative S2 paired with groundwater Alternative G3 (Containment and Hydraulic Controls) could achieve the source control Cleanup Goals in soils through a containment strategy. Alternatives S3 through S6 would

satisfy the source control Cleanup Goals through various combinations of treatment and excavations.

Based upon the available documentation regarding the site, EPA has concluded that the soil contaminants are not listed hazardous waste. Some soil testing has identified soils that exhibit hazardous characteristics, and if excavated, these soils would need to be treated to meet RCRA Land Disposal Restrictions prior to disposal in a RCRA-compliant unit.

Location- and Action-specific ARARs would be met under all the active alternatives.

The site does not contain any wetlands nor is it considered located in a flood plain or coastal zone.

Groundwater

The groundwater Cleanup Goals identified in Appendix II, Table 7, are MCLs or groundwater quality standards and, therefore, ARARs. Alternative G1 (No Action) would not meet ARARs. Alternative G2 (MNA and Institutional Controls) relies on the effectiveness of a complimentary soil remedy to remediate source areas, after which natural attenuation would eventually allow the aquifer to recover. Depending upon the selected soil remedy, the most highly contaminated arsenic in groundwater would not recover in a reasonable time frame under Alternative G2. None of the active groundwater treatment Alternatives (G3, G4 and G5) are expected to restore the aquifer without implementation of a soil source control remedy.

Alternatives G2 through G5 would require institutional controls, such as a CEA, to control use of the groundwater until groundwater Cleanup Goals can be met.

Because the No Action alternatives (S1 and G1) do not meet the threshold criteria (Protection of Human Health and the Environment and Compliance with ARARs), they were eliminated from consideration under the remaining seven criteria.

A complete list of ARARs can be found in EPA's July 2005 Draft-Final Feasibility Study, Appendix A.

Primary Balancing Criteria *- The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.*

3. Long-term effectiveness and permanence

A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Soils

Alternative S6 offers the highest degree of permanence because it is expected to achieve the greatest removal of arsenic and VOCs from the soils through excavation and off-site treatment and disposal. Alternative S4 is the next best alternative relative to long-term effectiveness since the largest mass of contaminants is removed from the site. Alternatives S3 and S5 are ranked lower than S4 and S6, since they involve in-situ treatment of the soil Source Areas, but they are still effective and permanent in the long-term. Alternative S2 is considered the least effective alternative in the long-term because it does not remove VOCs or arsenic or limit leaching to groundwater.

Groundwater

While several of the groundwater alternatives can adequately control the groundwater contamination and even reduce contaminant mass, none of the groundwater alternatives are effective in the long term without the implementation of a source control remedy for soils. In addition, the presence of clay and silt lenses within the shallow aquifer will make groundwater restoration difficult, especially for arsenic, since metals tend to sorb onto clay particles making them difficult to remediate.

Alternative G5 ranks higher than Alternative G3 (the two pumping alternatives) in long-term effectiveness and permanence since its goal is to restore aquifer conditions in a reasonable period of time, whereas Alternative G3 is only meant to control migration. Alternative G4 ranks higher than Alternatives G3 and G5 for the arsenic plume because the arsenic is quickly treated after

injection, curtailing or eliminating mobility. Alternative G4 ranks lower than the pumping alternatives (G3 and G5) for the VOC portion of the plume. In addition, for Alternative G4, treatability studies would be required to evaluate the permanence of geochemical fixation, considering whether the in-situ chemical reactions may be reversible under potential future site conditions.

Alternative G2, Natural Attenuation and Institutional Controls, may not attain the goal of aquifer restoration in a reasonable time frame, because the highest concentrations of arsenic in the groundwater may take 50 or more years to reach acceptable levels.

4. Reduction of toxicity, mobility, or volume

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Soils

Alternative S2 does not reduce the mobility, toxicity or volume of contaminants through treatment.

SVE is the only technology considered that would destroy contamination from the Source Areas, reducing the toxicity, mobility and volume of the VOC contamination. Solidification also would reduce the toxicity and mobility, but not the volume, of the arsenic Source Areas because the metal contamination would remain on site. Solidification can result in an increase in contaminant volume through the addition of concrete mixtures to the soil.

Regarding off-site disposal remedies, only Source Area soils that would be considered RCRA-characteristic waste would be treated prior to disposal. Therefore, Alternatives S6, S5 and S4, which address the Source Areas through excavation and off-site disposal, are comparable.

Alternatives S3 and S5 would be rated highest in this criterion by addressing the VOC Source Area soils through treatment. Alternatives S3 through S6 are comparable with regard to addressing the arsenic Source Area soils.

Groundwater

Alternative G4 employs a treatment technology, geochemical fixation, that reduces the toxicity and mobility of arsenic, though it does not address the VOC contamination. Pumping and

treatment alternatives (G3 and G5) physically remove the arsenic (and VOCs) from the aquifer. Alternatives G4 and G5 offer a comparable level of improvement in mobility and toxicity reduction, and would be rated higher than the hydraulic containment Alternative G3.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Soils

Alternative S2 has the least potential for construction-related impacts on workers, the community or the environment because it involves minimal construction.

Air monitoring would be an important component for all of the excavation alternatives (S4, S5, and S6) and for any on-site treatment technologies (S3 and S5) so that workers would wear the appropriate health and safety protection equipment during intrusive construction activities. Perimeter air monitoring would be required to assure that no vapor or dust releases occur during construction or O&M phases. Emission control techniques, such as the use of dust suppressants and minimizing the open working area of the excavation, would be employed as needed to minimize adverse affects on workers and the community from the site. Trucking routes with the least disruption to the surrounding community would be utilized.

Appropriate transportation safety measures would be required during the shipping of the contaminated soil for off-site disposal.

Alternative S6 is the most disruptive alternative to local properties because it would involve the largest soil excavation and could temporarily disrupt activities at, for example, Comarco Products.

Alternatives S4, S5, and S6 achieve remedial action objectives more quickly than Alternatives S2 and S3 since they each involve some type of excavation, which takes less time to implement. Of S4, S5 and S6, Alternatives S4 and S6 achieve remedial action objectives most quickly.

The time required for implementation of Alternative S2 is estimated at two months. Alternative S3 is estimated to take 2.5

years, because SVE is expected to take as long as two years to remediate the VOC Source Areas. The time frame for Alternative S3 assumes concurrent implementation of the SVE and solidification treatment technologies; however, the SVE treatment may need to be completed before solidification can be undertaken on portions of the site, extending the time frame for this alternative to as much as four or more years. Alternative S4 is estimated to take five months, Alternative S5 is estimated to take about 2.5 years, and Alternative S6 is estimated to take about eight months to implement.

Groundwater

Alternative G2 has no community impacts because it involves no construction. Alternatives G3 and G5 have minimal impacts with respect to the protection of workers, the community, and the environment during remedial construction. Alternative G4 has potential worker, community and environmental impacts due to the injection of a high pH material into the aquifer and the substantial soil mixing. Some emissions of VOCs and dust would be unavoidable, though risks to public health would be minimized through air monitoring and emission control measures. Alternative G4 is also likely to be the most disruptive to the community during construction.

The short-term effectiveness with respect to the time until the remedial action objectives are achieved is quickest for the groundwater collection and treatment Alternatives (G3 and G5). The time frames discussed below assume that a source control remedy in soils is implemented. For Alternative G5, it is expected that MCLs in groundwater (with the possible exception of the shallow groundwater closest to the arsenic Source Areas) will be achieved in as little as 10 years. Alternative G3, which is a containment remedy, has a remediation time frame for the VOCs (20 years) but does little to actively address the highest arsenic contamination. Alternative G4 will achieve the remedial action objectives faster than Alternative G3 for arsenic, but will rely on natural attenuation of the VOC plume, which will take longer. Alternative G2 may reach the VOC Cleanup Goals in 45 years, through natural attenuation, after the source is removed, but is not expected to address arsenic.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Soils

No technical implementability concerns exist for Alternatives S2 and S4. Alternative S6 would require the participation of a number of neighboring property owners and may require the curtailing or temporary relocation of operations at Comarco Products. All technical components of these alternatives would be easily implemented using conventional construction equipment and materials. Alternatives S3 and S5 would require treatability studies during remedial design, evaluating how best to implement the SVE system to remove the VOCs, and the solidification of the arsenic. Even after treatability studies to determine the appropriate injection points, solidification agents, dosage rates, and other performance parameters, the uncertainties regarding the implementability would still be high, especially given the heterogeneous nature of the fill material at the site. One way to increase the effectiveness of solidification would be to remove the heterogeneous fill material unsuitable for solidification, for off-site disposal; however, this introduces additional complexities and cost to its implementation.

Groundwater

Alternatives G2, G3 and G5 can be constructed at the site, and no technical or administrative implementability problems are expected for these alternatives. There is uncertainty, as highlighted in PRP comments received during the public comment period, as to the effectiveness of the two pumping remedies, Alternatives G3 and G5, in removing arsenic in the shallowest zones where arsenic concentrations are highest. Neither Alternative G3 or G5 may be able to meet the arsenic MCL in the shallow groundwater because of the relatively thin saturated thickness and low permeability of the soil. These conditions could lead to dewatering of the shallow groundwater above the clay and limit the ability to flush dissolved arsenic to the collection wells.

Alternative G4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G4, relative to all other groundwater alternatives, not the least of which would be determining whether the chemical precipitation of arsenic would indeed be irreversible over potential future site conditions. The chemical mixing process anticipated, rotary blending equipment operating to depths of 17 to 20 feet, has a number of implementability issues, including problems with subsurface debris (similar to Alternative S3), and access limitations (needing to work around buildings that may sit over portions of the arsenic plume). Other methods of

introducing the fixation chemicals may be effective; however, some of the same aquifer conditions that may limit the implementability of Alternative G3 and G5 (low permeability silt and clay lenses) would also limit the effectiveness of geochemical fixation unless physical mixing is employed. Treatability studies would be necessary to determine whether these implementation concerns can be over come.

Discharging extracted groundwater to the POTW raises administrative implementability concerns; however, the FS alternatives were developed in consultation with CCMUA. Pretreatment to satisfy CCMUA's sewer use ordinance may be required.

7. Cost

Includes estimated capital and O&M costs, and net present worth value of capital and O&M costs.

Soils

The cost of Alternative S1 is $0.

The estimated present worth cost of Alternative S2 is $3,310,000 which includes monitoring of the cap costs over a 50-year period.

The estimated present worth cost of Alternative S3 at $3,630,000 is less than the present worth cost associated with Alternative S4 which is $6,580,000. While Alternative S3 is less costly than Alternative S4, there are more uncertainties associated with on-site treatment that may increase the cost of this alternative, as compared to Alternative S4.

The estimate present worth cost of Alternative S5 is $6,190,000, and for total soil contamination excavation, treatment and off-site disposal, Alternative S6 is $8,300,000.

Groundwater

The cost of Alternative G1 is $0.

The estimated present worth cost of Alternative G2 is $550,000. This cost includes costs associated with the installation of a few additional monitoring wells, the sampling and analysis for natural attenuation of contamination in the groundwater, and operation and maintenance costs over a 50-year period.

The estimated present worth cost of Alternative G3 is $7,800,000. This cost includes the costs mentioned in Alternative G2 with the

addition of the installation of a pump and treat system before discharge to the local POTW.

The estimated present worth cost of Alternative G4 is $1,700,000. This cost includes the in-situ geochemical fixation, which treats the arsenic and provides a similar monitoring for natural attenuation as mentioned in Alternative G2.

The estimated present worth cost of Alternative G5 is $6,600,000. These costs include the entire construction of the treatment buildings, associated piping, and extraction wells, along with O&M costs over a 10-year period. Much of the construction and O&M costs are derived from conservative assumptions regarding the degree of pretreatment required prior to discharge to the POTW.

The costs for Alternatives G3, G4 and G5 are based upon current groundwater conditions. The groundwater remedial action is expected to follow completion of a soil remedy for the site, and the remediation costs may be lower and time frames shorter after the soil remedy is completed. This cost consideration is expected to affect the three alternatives equally.

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.

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8. State acceptance

Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure.

The State of New Jersey concurs with EPA's Selected Remedy.

9. Community acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial response measures proposed for the site. Oral comments were recorded from attendees of the public meeting. Written comments were received from the Edison Wetlands Association and a group of PRPs.

During oral comment (at the July 26, 2005 public meeting), a number of commenters expressed reservations about EPA's Proposed Plan, focusing in particular on the selection of remediation goals based upon commercial/industrial reuse instead of unrestricted use, and Environmental Justice concerns in Camden. Comments from the PRPs evaluated a whole range of technical issues, and recommend alternative remedies for addressing the site that are similar to FS Alternatives S3 and G4.

In Appendix V, the Responsiveness Summary addresses all comments received, both verbal and written.

PRINCIPAL THREAT WASTE

This response is considered the final remedy for all source soil material and contaminated groundwater at the site. EPA concluded that soils contaminated with arsenic at concentrations greater than 300 ppm, and VOC-contaminated soil at concentrations greater than 1 ppm total VOCs - the Source Area soils - constitute principal threats at the site.

SELECTED REMEDY

Based upon consideration of the results of the site investigation, the requirements of CERCLA, the detailed analysis of the response measures, and public comments, EPA has determined that Alternative S4, excavation and off-site transportation of Source Areas with treatment as necessary prior to land disposal, and capping residual soils, is the appropriate remedy for addressing the contaminated soil; and Alternative G5, Groundwater Collection and Treatment, is appropriate for addressing contaminated groundwater. Alternatives S4 and G5 satisfy the requirements of CERCLA §121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9). The major components of the selected response measures include:

- excavation of approximately 28,000 cubic yards of highly contaminated soil from the arsenic and VOC source areas;
- capping of the residual soil contamination that still poses a direct contact threat;
- off-site transportation and disposal of contaminated soil and debris, with treatment of all RCRA-hazardous wastes prior to land disposal, as necessary;
- backfilling and grading of all excavated areas with clean fill;

- installation of groundwater extraction wells to extract and pre-treat the contaminated groundwater, as necessary, prior to discharge to the local POTW;

- implementation of a long-term groundwater sampling and analysis program to assess migration and possible attenuation of the groundwater contamination over time; and,

- institutional controls, such as a deed notice, to prevent exposure to residual soils that may exceed levels that would allow for unrestricted use, and a Classification Exception Area, to restrict the installation of wells and the use of groundwater in the area of groundwater contamination.

The Selected Remedy will achieve soil cleanup goals via removal of the contaminated Source Areas and a portion of the contaminated groundwater in addition to the extraction and treatment of contaminated groundwater. The selected Soil Alternative will achieve the Direct Contact Cleanup Goals that are protective for commercial/industrial land use within a reasonable time frame, removes the source of groundwater contamination, and provides for long-term reliability of the remedy. The selected Groundwater Remedy will contain and treat the arsenic and VOC plumes and eventually restore the groundwater to the Cleanup Goals, which are MCLs and groundwater quality standards. A groundwater monitoring program will also be implemented to evaluate the performance of the remedy over time, and to be used to optimize pumping operations. Institutional controls, such as a deed notice and Classification Exception Area, would be required to protect public health until the groundwater cleanup goals can be achieved.

EPA expects implementation of this remedy to be phased, with the soil alternative portion of the remedy initiated first. The pumping rates and size of the groundwater treatment system would then be designed to address the contamination remaining in groundwater after the soil removal effort. During the groundwater remedial design and remedial action, periodic rounds of groundwater monitoring will also be conducted to assess the effectiveness of the soil removal and expected natural attenuation at the site.

As discussed earlier in the Comparative Analysis of Alternatives section of this Decision Summary, there are a number of uncertainties with regard to the implementation of the Selected Remedy for groundwater, Alternative G5, though in general it appears to have fewer implementability concerns than Alternative G4 (geochemical fixation). Alternative G5 also actively

addresses the VOCs in groundwater, whereas Alternative G4 relies on MNA. As highlighted in comments received during the public comment period from a group of PRPs, some of the uncertainties related to Alternative G4 may be resolved through treatability studies. The sequence of remediation planned (soil remediation followed by groundwater remediation), will allow time to implement treatability studies for evaluating Alternative G4. In addition, after completion of the soil remedy the VOC groundwater conditions may be significantly improved, and MNA alone may address the residual VOC plume. Pending the results of the treatability studies, EPA may reconsider Alternative G4 either alone or in combination with Alternative G5.

The estimated costs of the Selected Remedy are $6,580,000 to address the contaminated soil and $6,600,000 to address the contaminated groundwater. Summaries of the estimated remedy costs for both the soil and groundwater Selected Remedies are included as Appendix II, Tables 8 and 9 of this ROD. The cost estimates are based on the best available information regarding the anticipated scope of the overall remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD amendment. These are an order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project costs.

Based on the information available at this time, EPA and the State of New Jersey believe the selection of the Selected Remedy provides the best balance of trade-offs among the response measures with respect to the nine evaluation criteria. EPA believes that the Selected Remedy will be protective of human health and the environment, will comply with ARARs, will be cost-effective, and will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA §121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d) further

specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4).

Protection of Human Health and the Environment

The Selected Remedy, Soil Alternative S4 coupled with Groundwater Alternative G5, will be protective of human health and the environment through the removal of contaminated soils from the site that are a contact hazard and a source of groundwater contamination. In addition, the Selected Remedy will implement extraction and treatment of contaminated groundwater, off-site discharge of treated water and institutional controls. Groundwater monitoring will further ensure that contaminated groundwater will not impact human health and the environment. The Selected Remedy will, over time, eliminate all significant risks to human health and the environment associated with the contaminated soil and groundwater. In addition, this action will eliminate and/or reduce substantial sources of contamination to the groundwater. This action will result in the reduction of exposure levels to acceptable risk levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens and below an HI of 1 for non-carcinogens. Implementation of the Selected Remedy will not pose unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

The Selected Remedy for both soil and groundwater will comply with ARARs. There are no chemical-specific ARARs for the contaminated soil. The Cleanup Goals are risk-based for the surface soils, and are similar to NJDEP's non-residential direct contact soil criteria. In addition, NJDEP has developed Impact to Groundwater Soil Cleanup Criteria to address sources of groundwater contamination in deeper soils, and EPA considered these criteria in developing the VOC Source Area Cleanup Goals for this site.

Transportation and disposal of any solid and hazardous wastes will be performed in accordance with regulations specified by the U.S. Department of Transportation 49 CFR 170-179, RCRA (40 CFR 258, 263, 264, and 265) and New Jersey (N.J.A.C. 7:26G, N.J.A.C. 16:49)

Soil testing may identify soils that exhibit hazardous characteristics, and if excavated, these soils will be treated to meet RCRA Land Disposal Restrictions prior to disposal in a RCRA compliant unit. Hazardous waste identification and listing will

be performed in accordance with 40 CFR 261 and N.J.A.C. 7:25G-5. Hazardous waste disposal will be performed in accordance with 40 CFR 268.45 and N.J.A.C. 7:26G-11.

There are no wetlands on site and, therefore, no wetlands-related ARARs.

The Selected Remedy for groundwater has been developed to meet Federal and State ARARs for drinking water. Pursuant to the New Jersey Ground Water Quality Standards, N.J.A.C. 7:9-6 et seq., the groundwater at the site is classified as IIA, which means it is a current or potential source of drinking water. The more restrictive of Federal or New Jersey MCLs will be used as the cleanup levels for groundwater. The treated water will meet the State of New Jersey's permit requirements to discharge to the CCMUA. Because there are no promulgated Federal or State Cleanup Standards for soil contamination, EPA established Cleanup Goals based upon the baseline risk assessment.

A complete list of ARARs can be found in Appendix II, Table 10 of this document.

Cost Effectiveness

In the lead agency's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430(f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of these remedial alternatives were determined to be proportional to costs and hence, these alternatives represent a reasonable value for the money to be spent.

The total present worth for the Selected Remedy is estimated to be $13,180,000, which addresses both soil and groundwater contamination. Separately, the total present worth for the soil portion of the Selected Remedy is estimated at $6,580,000 and the total present worth for the groundwater portion of the Selected Remedy is estimated at $6,600,000.

The Selected Remedy is cost effective as it has been determined to provide the greatest overall protectiveness for its present worth costs.

Utilization of Permanent Solutions and Alternative Treatment Technologies

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs to the extent practicable, EPA has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, the bias against off-site treatment and disposal, and State and community acceptance.

The Selected Remedy will provide adequate long-term control of risks to human health and the environment through excavation and off-site disposal of Source Area soils, capping of remaining residual contaminated soils, and through groundwater collection, on-site pretreatment and discharge to the local POTW, along with institutional controls. The Selected Remedy does not present short-term risks different from the other alternatives. There are no special implementability issues since the Selected Remedy employs standard technologies.

Preference for Treatment as a Principal Element

The Selected Remedy excavates and treats the most highly contaminated soil and, therefore, addresses the principal threat wastes at the site.

Five-Year Review Requirements

This remedy will result in hazardous substances, pollutants, or contaminants remaining on the Martin Aaron site above levels that may allow for unlimited use and unrestricted exposure. Pursuant to Section 121(c) of CERCLA,, a statutory review will be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Martin Aaron site was released for public comment on July 15, 2005. An extension was requested by interested parties, the public and the PRPs of record. On August 15, 2005, EPA granted an extension of the comment period. The comment period closed on September 14, 2005.

The Proposed Plan identified Alternative S4 (Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils) for contaminated soil and Alternative G5 (Groundwater Collection and Treatment) for contaminated groundwater as EPA's selected alternatives. EPA reviewed all written and verbal comments submitted during the public comment period. The comments received are documented in the Responsiveness Summary. EPA made one significant change to the remedy, as originally identified in the Proposed Plan, allowing for treatability studies to further evaluate Alternative G4 (geochemical fixation). Pending the outcome of treatability studies, Alternative G4 could be implemented alone or in combination with the Selected Remedy for groundwater. No other significant changes to the remedy were necessary or appropriate.

APPENDIX I
FIGURES

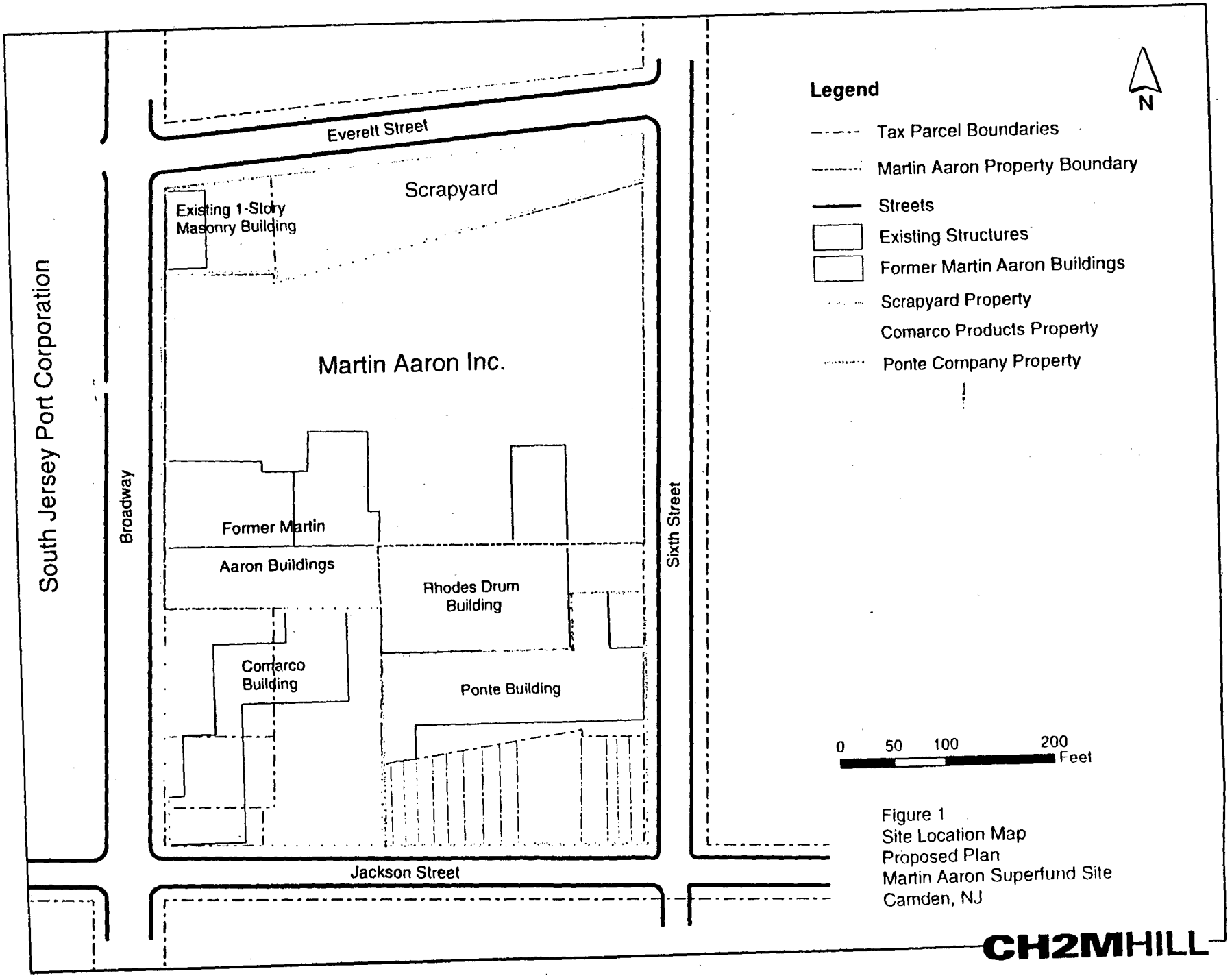

Figure 1
Site Location Map
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

500054

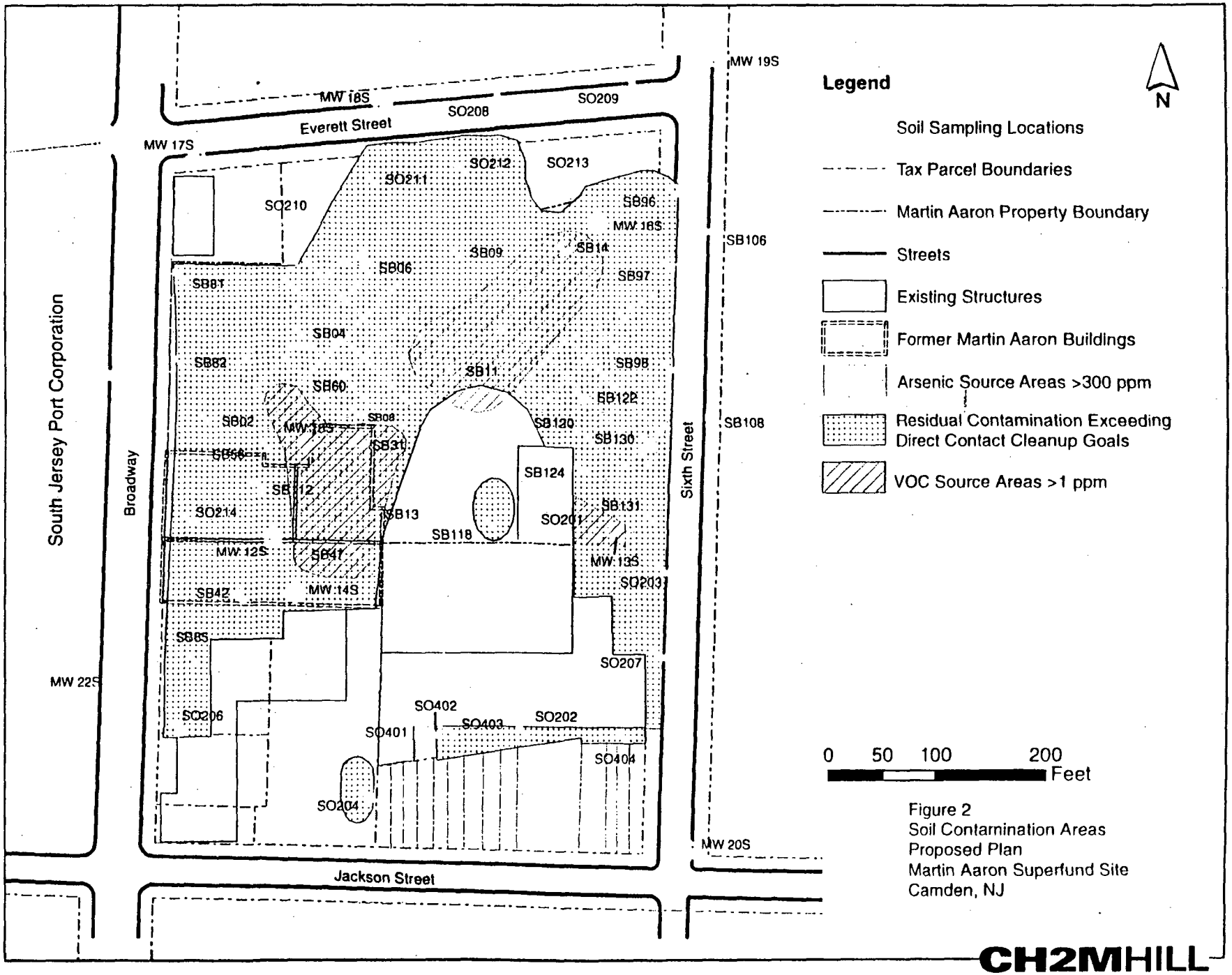

Figure 2
Soil Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

CH2MHILL

500055

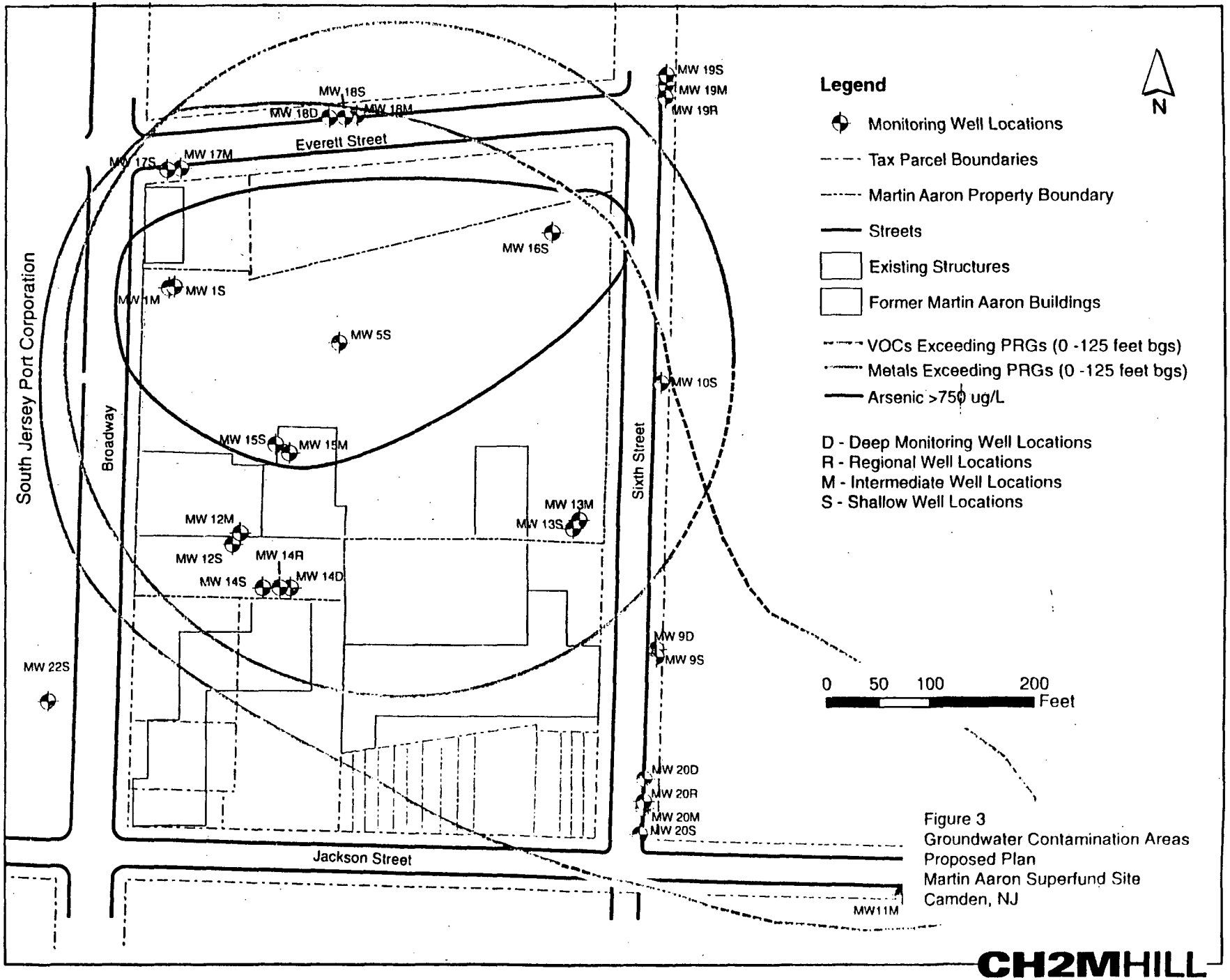

Figure 3
Groundwater Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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APPENDIX II
TABLES

APPENDIX II. TABLE 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Martin Aaron Property	Arsenic	2.1	766	mg/kg	24/24	286	mg/kg	95% UCL C
	Benzo[a]pyrene	0.04	110	mg/kg	23/24	62.3	mg/kg	99% UCL C

Scenario Timeframe: Current Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Martin Aaron Property	Arsenic	2.1	2330	mg/kg	62/62	734	mg/kg	95% UCL T
	Benzo[a]pyrene	0.02	110	mg/kg	56/62	18	mg/kg	95% UCT C

Scenario Timeframe: Current Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Scrap yard Area	Arsenic	17	27.7	mg/kg	2/2	27.7	mg/kg	Max

Scenario Timeframe: Current/Future
Medium: Surbsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Scrap yard Area	Arsenic	5.1	1240	mg/kg	8/8	1240	mg/kg	Max

APPENDIX II. TABLE 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Properties Adjacent to the Martin Aaron Property	Arsenic	3.2	339	mg/kg	5/5	339	mg/kg	Max

Scenario Timeframe: Current Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Properties Adjacent to the Martin Aaron Property	Arsenic	1.5	365	mg/kg	15/15	365	mg/kg	Max

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater - Upper PRM Aquifer	Arsenic	1.6	7130	ug/l	25/28	3620	ug/l	99% UCL C
	Vinyl Chloride	0.55	58	ug/l	25/51	14.1	ug/l	97.5% UCL C

APPENDIX II. TABLE 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater - Middle PRM Aquifer	Arsenic	1.6	7130	ug/l	25/28	3620	ug/l	99% UCL C
	Vinyl Chloride	0.55	58	ug/l	25/51	14.1	ug/l	97.5% UCL C

Key
mg/kg: milligrams per kilogram
ug/l: micrograms per liter
Max: Maximum detected concentration
95% UCL T: 95% Upper Confidence Limit of Log Transformed Data
95% UCL C: 95% Chebyshev Upper Confidence Limit
97.5% UCL C: 97.5% Chebyshev Upper Confidence Limit
99% UCL C: 99% Chebyshev Upper Confidence Limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of potential concern (COPCs) and exposure point concentration for each of the COPCs detected in media at theMartin Aaron Superfund site (*i.e.*, the concentration that will be used to estimate the exposure and risk from each COPC in each medium). Arsenic and benzo[a]pyrene are the COPCs in the surface and subsurface soils at the Martin Aaron property, while arsenic is the only COPC in the surface and subsurface soils in the scrap yard area and in the properties adjacent to the site. Arsenic and vinyl chloride are the COPCs in the groundwater. The table includes the range of concentrations detected for each COPC in each medium, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was derived.

APPENDIX II. TABLE 2

Non-Cancer Toxicity Data Summary

-Ingestion

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Uncer-tainty /Modify Factors	Sources of RfD: Target Organ	Dates of RfD:
Arsenic	Chronic	3E-04	mg/kg-day	3E-04	mg/kg-day	Skin/ Circulatory	3/1	IRIS	01/03
Benzo[a]pyrene	NA	NA		NA		NA	NA	NA	NA
Vinyl Chloride	Chronic	3E-03	mg/kg-day	3E-03	mg/kg-day	Liver	30/1	IRIS	03/04

-Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhal. RfC	Inhal. RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Uncer-tainty /Modify Factors	Sources of RfD: Target Organ	Dates of RfC:
Arsenic	NA	NA		NA		NA	NA	NA	NA
Benzo[a]pyrene	NA	NA		NA		NA	NA	NA	NA
Vinyl Chloride	Chronic	1.0E-03	mg/m³	2.9E-03	mg/kg-day	Liver	30/1	IRIS	03/04

Key
NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to arsenic, benzo[a]pyrene, and vinyl chloride, the contaminants of potential concern in both groundwater and surface and subsurface soils.

APPENDIX II. TABLE 3

Cancer Toxicity Data Summary

-Ingestion, Dermal Contact

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence Cancer Guideline Description	Source	Date
Arsenic	1.5	(mg kg-day)$^{-1}$	1.5	(mg kg-day)$^{-1}$	A	IRIS	03 04
Benzo[a]pyrene	7.3	(mg kg-day)$^{-1}$	7.3	(mg kg-day)	B2	IRIS	03 03
Vinyl Chloride (adult)	1.5	(mg kg-day)$^{-1}$	1.5	(mg kg-day)$^{-1}$	A	IRIS	03 04

-Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence Cancer Guideline Description	Source	Date
Arsenic	4.3E-03	(mg cu. m)$^{-1}$	15	(mg-kg-day)$^{-1}$	A	IRIS	03 04
Benzo[a]pyrene	NA	(mg cu. m)$^{-1}$	NA	(mg-kg-day)$^{-1}$	B2	NA	NA
Vinyl Chloride (adult)	4.4E-06	(mg cu. m)$^{-1}$	1.5E-02	(mg-kg-day)$^{-1}$	A	IRIS	03.04

Key

IRIS: Integrated Risk Information System, U.S. EPA
NA: No information availabl

EPA Group:

A - Human carcinogen
B1 - Probable Human Carcinogen - Indicates that limited human data are available
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to arsenic, benzo[a]pyrene, and vinyl chloride, the contaminants of potential concern in both groundwater and surface and subsurface soils.

APPENDIX II. TABLE 4

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	Skin	086		0.24	1.1
							Total Hazard Index =	3.9

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	Skin	0.93	–	0.18	1.1
							Total Hazard Index =	3.7

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	Skin	2.4	–	0.47	2.9
							Total Hazard Index =	8.2

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Scrap yard Area	Arsenic	Skin	4.0	–	0.8	4.8
							Total Hazard Index =	5.6

APPENDIX II. TABLE 4

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	Skin	1.1	-	0.22	1.3
							Total Hazard Index =	2.7

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	Skin	1.2	-	0.24	1.4
							Total Hazard Index =	2.9

Scenario Timeframe: Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Upper PRM Aquifer	Arsenic	Skin	120		0.53	120
							Total Hazard Index =	130

Summary of Risk Characterization for Non-Carcinogens

The noncancer risk estimates presented represent both the noncarcinogenic hazards associated with exposure to the contaminants of potential concern as well as the total noncancer hazard index from exposure to all site-related contaminants detected. As shown in the table, the most significant contribution to the total noncancer hazard is from arsenic; no other individual contaminant contributed significantly to the total noncancer hazard.

APPENDIX II. TABLE 5

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	5.0E-05		1.4E-05	6.4E-05
			Benzo[a]pyrene	5.3E-05	-	6.3E-05	1.2E-04
						Total Risk =	2.3E-04

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	1.5E-04	-	3.0E-05	1.8E-04
			Benzo[a]pyrene	1.6E-04	-	1.4E-04	3.0E-04
						Total Risk =	6.0E-04

Scenario Timeframe: Current Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	1.4E-05	-	8.5E-07	1.5E-05
			Benzo[a]pyrene	1.5E-05	-	3.9E-06	1.9E-05
						Total Risk =	3.8E-05

APPENDIX II. TABLE 5

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	3.8E-04	-	7.6E-05	4.6E-04
			Benzo[a]pyrene	4.6E-05	-	3.9E-05	8.5E-05
						Total Risk =	6.3E-04

Scenario Timeframe: Current Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	3.7E-05	-	2.2E-05	3.9E-05
			Benzo[a]pyrene	4.4E-06	-	1.1E-06	5.5E-06
						Total Risk =	4.6E-05

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Scrap yard Area	Arsenic	1.5E-05	-	2.9E-06	1.7E-05
						Total Risk =	2.5E-05

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Scrap yard Area	Arsenic	6.5E-04	-	1.3E-04	7.8E-04
						Total Risk =	7.9E-04

APPENDIX II. TABLE 5

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	1.8E-04	-	3.5E-05	2.1E-04
						Total Risk =	3.3E-04

Scenario Timeframe: Current Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	1.9E-04	--	3.8E-05	2.3E-04
						Total Risk =	3.5E-04

Scenario Timeframe: Future
Receptor Population: Commercial Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Upper PRM Aquifer	Arsenic	1.9E-02	-	8.5E-05	1.9E-02
			Vinyl chloride	7.4E-05		5.0E-06	7.9E-05
						Total Risk =	1.9E-02

Summary of Risk Characterization for Carcinogens

The cancer risk estimates presented represent both the cancer risk associated with exposure to the contaminants of potential concern as well as the total cancer risk from exposure to all site-related contaminants detected. As shown in the table, the most significant contribution to the total cancer risk is from arsenic, benzo[a]pyrene, and vinyl chloride; no other individual contaminant contributed significantly to the total cancer risk.

APPENDIX II, TABLE 6
Cleanup Goals for Soil
Martin Aaron Site

Chemical	Direct-Contact Cleanup Goals (Commercial/Industrial)	Source Area Cleanup Goals
Metals		
Arsenic	20	300
VOCs		
Benzene	1.4	1
Bis(2-chloroethyl)ether	0.58	
Chloroform	0.47	1
Tetrachloroethylene	1.3	1
Trichloroethylene	0.11	1
Vinyl Chloride	0.75	10
SVOCs		
Benzo[a]anthracene	2.1	
Benzo[a]pyrene	0.21	
Benzo[b]fluoranthene	2.1	
Benzo[k]fluoranthene	21	
Dibenzo[ah]anthracene	0.21	
Indeno[123-cd]pyrene	2.1	
Pesticides		
Aldrin	0.10	
Dieldrin	0.11	
PCB - Aroclor 1254	10	
PCB - Aroclor 1260	10	

Notes:
1. All goals expressed as parts per million (ppm).

APPENDIX II, TABLE 7
Cleanup Goals for Groundwater
Martin Aaron Site

Chemical	EPA MCL	NJ MCL	NJ GWQS
Metals	—		
Arsenic	10	50	8
VOCs			
Benzene	5	1	1
Bis(2-chloroethyl)ether	NA	NA	10
Tetrachloroethylene	5	1	1
Trichloroethylene	5	1	1
Vinyl Chloride	2	2	5
Pesticides			
Dieldrin	NA	NA	0.03

1. The lowest values of the promulgated cleanup goals shown above, shall be used.
2. All goals expressed as parts per billion (ppb).

APPENDIX II, TABLE 8

Alternative: Alternative S4
Name: Cap, Excavation, Treatment and Offsite Disposal

COST ESTIMATE SUMMARY

Site: Martin Aaron Superfund Site, Camden, N.J.
Location: Soil Media
Phase: Feasibility Study
Base Year: 2005
Date: 7/8/2005 14:18

Description: Excavation of Arsenic >300 ppm in soil with offsite disposal. Ex situ stabilization of 50% and disposal at Subtitle C Landfill. Remaining 50% of arsenic soil disposed without stabilization at Subtitle D Landfill. Excavation of VOC impacted soils > 10^-6 ELCR, stabilization assumed not needed, and disposed at Subtitle D Landfill. Excavated areas backfilled with clean certified material and and asphalt cap constructed over preceeding area and area with VOCs, SVOCs, Pesticides, PBCs and Metals exceeding 10^-6 ELCR, Hi-1 or PRGs and excavated areas as well. Institutional controls include deed notices describing the site contamination and restrictions on site use and soil excavation.

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Institutional Controls	1	LS	$15,000	$15,000	Source 1
Predesign Investigations					
Investigation	1	LS	$50,000	$50,000	CH2M Est
SUBTOTAL				$50,000	
Asphalt Cap Area					
Silt Fencing (MA Property)	2,100	FT	$3.36	$7,056	MEANS 16-05-0200
Clear and Grub (MA Property)	3.9	AC	$8,066	$31,729	MEANS 17-01-0100
Rough Grading (MA Property)	21,404	SY	$5.15	$110,134	MEANS 17-03-0100
Fine Grading (MA Property)	21,404	SY	$1.42	$30,429	MEANS 17-03-0100
Gravel Base, 4 inches (MA Property)	2,677	CY	$35	$92,487	MEANS 18-01-0100
Asphalt Cap 4" Base Course (MA Property)	3.9	AC	$130,000	$511,395	Malcon Quote
SUBTOTAL				$783,227	
Mobilization/Demobilization	5%			$39,161	Per CCI
Subcontractor General Conditions	15%			$40,774	Per CCI, Malcon costs only
SUBTOTAL				$863,162	
Excavation					
Soil Excavation and Truck Loading	34,494	CY	$5.54	$191,140	MEANS 17-03-0276
Subtitle C Landfill Transport, Treatment and Disposal	10,352	CY	$114	$1,180,111	Model City Quote
Subtitle D Landfill Transport and Disposal	24,142	CY	$30	$724,273	Model City Quote
Clean Backfill	34,494	CY	$20	$689,886	Compacted, per CCI
Full TCLP Analysis	43	EA	$500	$21,559	1 sample 800 CY, Analytical Services Center Quote
SUBTOTAL				$2,806,969	
Mobilization/Demobilization	5%			$140,348	Per CCI
Subcontractor General Conditions	15%			$135,388	Per CCI, Less Disposal Costs
SUBTOTAL				$3,082,705	
Soil Verification Sampling					
Soil Samples	1	LS	$50,000	$50,000	Project Exper
SUBTOTAL				$50,000	
Building Demolition					
Demolish Masonary Foundation Wall	3,778	CF	$4.43	$16,736	
Demolish Floor and Foundation	14,183	CF	$7.92	$112,263	MEANS 16-01-0100
Demolish Roof	21,274	SF	$0.44	$9,359	
Asbestos, Lead and PCB Survey	1	LS	$10,000.00	$10,000	
Subtitle D Landfill Disposal	1,129	CY	$30	$33,874	Model City Quote
SUBTOTAL				$182,232	
Mobilization/Demobilization	5%			$9,112	Per CCI
Subcontractor General Conditions	15%			$27,335	Per CCI
SUBTOTAL				$218,679	
SUBTOTAL				$4,280,000	
Contingency	25%			$1,070,000	10% Scope + 15% Bid
SUBTOTAL				$5,350,000	
Project Management	5%			$267,500	USEPA 2000, p. 5-13, $2M-$10M
Remedial Design	8%			$428,000	USEPA 2000, p. 5-13, $2M-$10M
Construction Management	6%			$321,000	USEPA 2000, p. 5-13, $2M-$10M
SUBTOTAL				$1,016,500	
TOTAL CAPITAL COST				**$6,400,000**	

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Cap Semi-annual Inspection	4	HR	$60	$240	
Cap Repair	1	LS	$5,114	$5,114	Assumes 1% of area requires repair annually
Cap Inspection and Repair Report	1	LS	$500	$500	Biennial Report to NJDEP
SUBTOTAL				$5,854	
Contingency	30%			$1,756	10% Scope + 20% Bid
SUBTOTAL				$7,610	
Project Management	5%			$381	
Technical Support	10%			$761	
TOTAL ANNUAL O&M COST				**$8,800**	

PERIODIC COSTS

DESCRIPTION	YEAR	QTY	UNIT	UNIT COST	TOTAL	NOTES
5 year Review	5	1	LS	$15,000	$15,000	
5 year Review	10	1	LS	$15,000	$15,000	
5 year Review	15	1	LS	$15,000	$15,000	
5 year Review	20	1	LS	$15,000	$15,000	
5 year Review	25	1	LS	$15,000	$15,000	
Asphalt Cap Replacement	30	1	LS	$168,420	$168,420	Assume 30% of 4" cap replaced
5 year Review	35	1	LS	$15,000	$15,000	
5 year Review	40	1	LS	$15,000	$15,000	
5 year Review	40	1	LS	$15,000	$15,000	
5 year Review	45	1	LS	$15,000	$15,000	
5 year Review	50	1	LS	$15,000	$15,000	
				Total	$320,000	
TOTAL ANNUAL PERIODIC COST					**$320,000**	

PRESENT VALUE ANALYSIS

Discount Rate = 7.0%

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE	NOTES
CAPITAL COST	0	$6,400,000	$6,400,000	1.000	$6,400,000	
ANNUAL O&M COST	1 to 50	$440,000	$8,800	13.801	$121,447	
PERIODIC COST	5	$15,000	$15,000	0.71	$10,695	
PERIODIC COST	10	$15,000	$15,000	0.51	$7,625	
PERIODIC COST	15	$15,000	$15,000	0.36	$5,437	
PERIODIC COST	20	$15,000	$15,000	0.26	$3,876	
PERIODIC COST	25	$15,000	$15,000	0.18	$2,764	
PERIODIC COST	30	$168,420	$168,420	0.13	$22,125	
PERIODIC COST	35	$15,000	$15,000	0.09	$1,405	
PERIODIC COST	40	$30,000	$30,000	0.07	$2,003	
PERIODIC COST	45	$15,000	$15,000	0.05	$714	
PERIODIC COST	50	$15,000	$15,000	0.03	$509	
		$7,200,000			$6,578,600	
TOTAL PRESENT VALUE OF ALTERNATIVE					**$6,580,000**	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000)

APPENDIX II, TABLE 9

Alternative: G5
Name: Groundwater Collection and Treatment

COST ESTIMATE SUMMARY

Site: Martin Aaron Superfund Site, Camden, N. J.
Media: Groundwater
Phase: Feasibility Study
Base Year: 2005
Date: 7/8/2005 14:15

Description: Institutional controls include Classification Exception Area. Groundwater extraction collection with 13 EWs and treatment using a chemical precipitation process with discharge of treated effluent to the Camden POTW.

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Institutional Controls (Groundwater Use Restrictions)	1	LS	$15,000	$15,000	Source 1
Preceptign Investigations					
Install 5 additional monitoring wells	5	LS	$1,785	$8,925	CH2M Est
Bench Scale Precipitation Testing	1	LS	$25,000	$25,000	
Pilot Scale Test	1	LS	$100,000	$100,000	
SUBTOTAL				$133,925	
EW Installation					
Mobilization/Demobilization	1	LS	$25,000	$25,000	Includes submittals
Soil Borings	850	FT	$47	$39,225	Minor Drilling Quote
6-inch PVC Well Casing	390	FT	$25	$9,589	33-73-0120
6-inch PVC Well Screen	790	FT	$44	$11,948	33-73-0201
Trenching	3,000	LF	$30	$90,000	Project Experience
Conveyance Piping	3,000	LF	$12	$36,000	Project Experience
Pumps	13	EA	$3,000	$39,000	
SUBTOTAL				$241,372	
Treatment System					
Remediation Building w/ Electrical & HVAC	1	LS	$156,000	$156,000	MEANS SF Costs
Pentech Lamella Gravity Settler (LGS-300/SS)	1	EA	$50,000	$50,000	
Pentech DynaSand Filter (DSF-10)	1	EA	$101,800	$101,800	Pentech Quote for Clarifier & Filter
3 CF Sludge Filter Press	1	EA	$13,500	$13,500	Pentech Quote
5,000 Gallon Tank (Coagulation Tank)	2	EA	$7,884	$15,768	33-10-8840
Chemical Feeder (10 gph)	4	EA	$3,089	$12,356	33-12-9505
2,000 Gallon Tank (Coagulation Run Tank)	1	EA	$4,714	$4,714	33-10-8658
3000 Gallon Tank (Filtrate Storage Tank)	1	EA	$6,180	$6,180	33-10-8659
8,000 Gallon Tank (Sludge Storage Tank)	1	EA	$12,600	$12,600	33-10-8661
Mixer	3	EA	$4,362	$13,087	33-13-0428
Transfer Pump - 100 gpm	1	EA	$6,211	$6,211	33-23-0561
Transfer Pump - 35 gpm	2	EA	$3,884	$7,770	33-23-0562
Transfer Pump - 10 gpm	3	EA	$1,322	$3,967	33-23-0563
Hydrogen Peroxide Feed System	1	EA	$3,820	$3,820	33-33-0172
Control System w/ Autodialer, Remote Telemetry	1	LS	$50,000	$50,000	CH2M Est
Startup - Labor	240	HRS	$80	$19,200	CH2M Est - 2 persons
Startup Equipment	1	LS	$2,000	$2,000	CH2M Est
Startup Consumables	1	LS	$1,000	$1,000	CH2M Est
SUBTOTAL				$479,796	
Allowance for Misc. Items	20%			$95,959.11	
Fittings, Valves, Miscellaneous Appurtenances	5%			$23,989.78	
Mobilization/Demobilization	5%			$23,989.78	
Subcontractor General Conditions	15%			$71,969.33	
SUBTOTAL				$695,704	
SUBTOTAL				$1,086,001	
Contingency	25%			$271,500	10% Scope + 15% Bid
SUBTOTAL				$1,357,501	
Project Management	6%			$81,450	USEPA 2000: p 5-13, $500K-$2M
Remedial Design	12%			$162,900	USEPA 2000: p 5-13, $500K-$2M
Construction Management	8%			$108,600	USEPA 2000: p 5-13, $500K-$2M
SUBTOTAL				$352,950	
TOTAL CAPITAL COST				$1,700,000	

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	YEAR	QTY	UNIT	COST	TOTAL	NOTES
GW MNA Sampling						
Groundwater Samples		21	LS	$360	$7,560	Vocs, metals, MNA analyses
QC Samples		6	LS	$360	$2,160	Vocs and metals analyses
Groundwater Sampling, Level C						
Labor		48	HRS	$80	$3,840	CH2M Est - 2 persons
Equipment - misc.		1	LS	$500	$500	CH2M Est
Consumables		1	LS	$200	$200	CH2M Est
Data Validation		13.5	HRS	$80	$1,080	CH2M Est
Reporting		16	HRS	$80	$1,280	CH2M Est
SUBTOTAL					$16,620	
Allowance for Misc. Items		20%			$3,324	
SUBTOTAL					$19,944	
Contingency		30%			$5,983	10% Scope + 20% Bid
SUBTOTAL					$25,927	
Treatment System						
Chemical Usage		1	LS	$60,000	$60,000	CH2M Est
Cement for Solidification of Sludge		2	CY	$20	$40	CH2M Est
Transport and Disposal of Solidified Sludge		10	CY	$100	$1,000	CH2M Est
Routine Operations, Maintenance, Monitoring		2080	HR	$80	$166,400	CH2M Est
EW Monitoring Laboratory Analysis		168	EA	$360	$60,480	33-02-0508
Treatment System Laboratory Analysis		60	EA	$360	$21,600	VOC and metals analysis
Data Validation, Database Management		114	HR	$80	$9,120	CH2M Est
O&M Project Management		1	LS	$38,640	$38,640	15% of Sampling and Data Mgmt
Electricity		12	Months	$200	$2,400	CH2M Est
Reporting		1	LS	$20,000	$20,000	CH2M Est
POTW User Fee (first 4,000 CF)		4,000	CF	0.019	$76	0 to 4000 CF (Camden Water, LLC Quote)
POTW User Fee FLOW > 4,000 CF		5,968,72	CF	0.023	$134,298	> 4000 CF (Camden Water, LLC Quote)
Electricity For EW Pumps		42,477	kWH	$0.08	$3,300	MEANS 33-42-010
SUBTOTAL					$517,352	10% Scope + 20% Bid
Contingency		30%			$155,206	
SUBTOTAL					$672,558	
TOTAL ANNUAL O&M COST					$700,000	

PERIODIC COSTS

DESCRIPTION	YEAR	QTY	UNIT	UNIT COST	TOTAL	NOTES
5 year Review	5	1	LS	$15,000	$15,000	
5 year Review	10	1	LS	$15,000	$15,000	
SUBTOTAL					$30,000	
TOTAL ANNUAL PERIODIC COST					$30,000	

PRESENT VALUE ANALYSIS

Discount Rate = 7.0%

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE	NOTES
CAPITAL COST	0	$1,700,000	$1,700,000	1.000	$1,700,000	
ANNUAL O&M COST	1 to 10	$7,000,000	$700,000	7.02	$4,916,507	
PERIODIC COST	5	$15,000	$15,000	0.71	$10,695	
PERIODIC COST	10	$15,000	$15,000	0.51	$7,625	
		$8,730,000			$6,634,827	
TOTAL PRESENT VALUE OF ALTERNATIVE					$6,600,000	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000)

Table 10

Potential Chemical-Specific ARARs

Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Federal Safe Drinking Water Act	National Primary Drinking Water Standards - Maximum Contaminant Level Goals (MCLGs)	40 CFR 141	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety.	The MCLs have been applied to the remediation of groundwater.
Federal Safe Drinking Water Act	National Secondary Drinking Water Standards-Secondary MCLs	40 CFR 143	Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.	
Federal Resource Conservation and Recovery Act	Groundwater Protection Standards and Maximum Concentration Limits	40 CFR 264, Subpart F	Establishes standards for groundwater protection.	
State of New Jersey Statutes and Rules	Drinking Water Standards-Maximum Contaminant Levels (MCLs)	N.J.A.C. 7:10 Safe Drinking Water Act	Establishes MCLs that are generally equal to or more stringent the SDWA MCLs.	Although there are no local receptors and all properties are served by city water, the underlying aquifer is a drinking water supply source.
State of New Jersey Statutes and Rules	National Secondary Drinking Water Standards-Secondary MCLs	N.J.A.C. 7:10-7 Safe Drinking Water Act	Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.	
State of New Jersey Statutes and Rules	Groundwater Quality Standards	N.J.A.C. 7:9-6 Groundwater Quality Standards	Establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups.	

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Table 10

Action Specific ARARs

Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Safe Drinking Water Act (SDWA)	40 USC 300 et seq.		
National Primary Drinking Water Standards	40 CFR 14P	Establishes health-based standards for public water systems (maximum contaminant levels [MCLs]).	MCLs are ARARs in cases where affected groundwater is or may be used directly for drinking water.
National Secondary Drinking Water Standards	40 CFR 143	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels [SMCLs]).	
Maximum Contaminant Level Goals	PL 99-339, 100 Stat. 642 (1986)	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	
Clean Water Act (CWA)	33 USC 1251 et seq.		
Water Quality Criteria	40 CFR 131 Quality Criteria for Water, 1976, 1980, and 1986	Sets criteria for water quality based on toxicity to human health.	If water is discharged to surface water.
Ambient Water Quality Criteria	40 CFR 131	Sets criteria for ambient water quality based on toxicity to aquatic organisms.	If water is discharged to surface water.
Toxic Pollutant Effluent Standards	40 CFR 121	Establishes effluent standards or prohibitions for certain toxic pollutants; i.e., aldrin/dieldrin, DDT, DDD, DDE, endrin, toxaphene, benzideine, and PCBs	If water treatment and discharge will be required during remediation.
Resource Conservation and Recovery Act (RCRA)	42 USC 6901 et seq.		
Identification and Listing of Hazardous Wastes	40 CFR 261	Defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR 262-265, 270, and 271.	For identification of listed or characteristic RCRA wastes at a site.
Releases from Solid Waste Management Units (SWMUs)	40 CFR 264, Subpart F	Establishes maximum concentration levels for specific contaminants from a solid waste management unit (SWMU).	Probably not ARARs for state Superfund sites.
Land Disposal Restrictions (LDRs)	40 CFR 268	Establishes treatment standards for land disposal of hazardous wastes.	Applicable materials will be disposed of on land

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Table 10

Action Specific ARARs

Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Clear Air Act (CAA)	42 USC 7401		
National Ambient Air Quality Standards	40 CFR 50	Establishes primary and secondary standards for six pollutants to protect the public health and welfare.	These are ARARs for remedial alternatives that would result in emissions of the specific pollutants during implementation.
National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 61	Establishes regulations for specific air pollutants such as asbestos, beryllium, mercury, vinyl chloride, and benzene.	Potentially not applicable to contaminants at this site.
New Performance Standards for Criteria and Designated Pollutants	40 CFR 60	Establishes new source performance standards (NSPSs) for certain classes of new stationary sources.	Potentially not applicable because the remediation will not involve a new source (e.g., an on-site incinerator) subject to NSPS.
New Jersey Statutes and Rules	New Jersey Administrative Code (N.J.A.C.); New Jersey Statutes Annotated (N.J.S.A)		
Drinking Water Standards - maximum contaminant levels (MCLs)	58 N.J.S.A. 12A-1	Establishes MCLs that are generally equal to or more stringent than SDWA MCLs.	Although there are no local receptors and all properties are served by city water, the underlying aquifer is a drinking water supply source.
Technical requirements for site remediation, and guidance document for the remediation of contaminated soils	N.J.A.C. 7:26E	Establishes minimum regulatory requirements for remediation of contaminated sites in New Jersey.	While a federal EPA lead, these requirements have been identified as applicable to the site
National Historic Preservation Act	16 USC 469 et seq. 40 CFR 6301(c)	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	If historical or archaeological data could potentially be encountered during remediation
Fish and Wildlife Coordination Act	16 USC 661-666	Requires consultation when federal department or agency proposes or authorizes any modification of any stream or other water body and adequate provision for protection of fish and wildlife resources.	Not an ARAR because the response actions will not affect surface water bodies
Clean Water Act (CWA)	33 USC 1251-1376		

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Table 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Dredge of Fill Requirements (Section 404)	40 CFR 230-231	Requires discharges to address impacts of discharge of dredge or fill material on the aquatic ecosystem.	Not an ARAR because the response actions will not involve discharge of dredge or fill into surface water body.
Executive Order on Flood Plain Management	Executive Order 11988	Requires federal agencies to evaluate the potential effects of actions they may take in a flood plain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a flood plain.	An ARAR if any portion of the site us within the 100-year flood plain.
New Jersey Flood Hazard Control Act	N.J.A.C. 7:13	State standards for activities within flood plains.	An ARAR for those aspects of the site work that are within the flood plain.
New Jersey Freshwater Protection Act	N.J.S.A. 13:9B-1; N.J.A.C 7:7A	Require permits for regulated activity disturbing wetlands.	Not an ARAR because no wetlands on site would be affected.
Endangered Species Act	16 USC 1531 et seq.; 40 CFR 400	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Endangered and Non-Game Species Act	N.J.S.A. 23:2A-1	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Fish and Wildlife Coordination Act	16 USC 661 et seq.	Requires conservation of fish and wildlife and their habitats.	Not and ARAR because this site does not contain fish and wildlife habitat.
New Jersey Uniform Construction Code	N.J.A.C. 5:23	Establishes standards for all new construction and renovation.	This may be an ARAR to the extent that new construction falls within the standards.
Clean Water Act (CWA)	33 USC 1251-1376		
National Pollutant Discharge Elimination System (NPDES)	40 CFR 125	Requires permit for the discharge of pollutants for any point source and stormwater runoff for specific Standard Industrial Codes (SICs) into waters of the United States.	Substantive requirements for a permit will be required for discharge to a surface water body if water generated during the remediation is discharged to surface water.
Effluent Guidelines and Standards for the Point Source Category	40 CFR 414	Requires specific effluent characteristics for discharge under NPDES permits.	Probably not applicable because there will be no ongoing commercial activity at a state Superfund site.
National Pretreatment Standards	40 CFR 403	Sets standards to control pollutants that pass through or interfere with treatment processes in public treatment works or that may contaminate sewage discharge.	Only if the selected alternative includes discharge of water to a POTW
Resource Conservation and Recovery Act (RCRA)	42 USC 6901-6987		

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Table 10

Action Specific ARARs

Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR 257	Establishes criteria for use in determining which solids waster disposal facilities and practices pose a reasonable probability of adverse effects on public health or the environment and thereby constitute prohibited open dumps.	Not an ARAR because on-site disposal is not an option at the site.
Standards Applicable to Generators of Hazardous Wastes	40 CFR 262	Establishes standards for generators of hazardous wastes.	An ARAR because response action involves soil or water that would be considered hazardous under RCRA.
Standards Applicable to Transporters of Hazardous Wastes	40 CFR 263	Establishes standards that apply to transporters of hazardous wastes within the United States if the transportation requires a manifest under 40 CFR 262.	An ARAR because action involves off-site transportation of soil or water that would be considered hazardous under RCRA.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs)	40 CFR 264	Establishes minimum national standards that define the acceptable management of hazardous wastes for owners and operators of facilities that treat, store, or dispose of hazardous wastes.	Part 264 requirements may be ARARs for certain remedial actions under CERCLA. See each subpart that follows.
General Facility Standards	Subpart B	Establishes minimum standards for treatment, storage, and disposal facilities (TSDFs).	May be an ARAR if any remedial actions are selected for which other subparts of 264 are relevant and appropriate.
Preparedness and Prevention	Subpart C	Establishes minimum standards for hazard management.	Not an ARAR because on-site storage or treatment will not be conducted.
Contingency Plan and Emergency Procedures	Subpart D	Establishes minimum standards for hazard management.	Not an ARAR because on-site storage or treatment will not be conducted.
Manifest System, Recordkeeping, and Reporting	Subpart F	Establishes standards for tracking waste during off-site transport.	An ARAR because response action will involve off-site transport of hazardous waste.
Releases from Solid Waste Management Units (SWMUs)	Subpart F	Establishes standards for control of SWMUs.	Not an ARAR because response action will not involve on-site disposal.
Closure and Post-Closure	Subpart G	Establishes standards for site closure.	CERCLA establishes review of remedial actions should contaminants be left on-site. Substantive requirements need to be met, including monitoring and deed notices.

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Table 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Financial Requirements	Subpart H	Establishes administrative requirements for demonstrating fiscal responsibilities.	These are administrative requirements only.
Use and Management of Containers	Subpart I	Establishes standards for container storage.	May be ARARs if an alternative would involve storage of containers of hazardous wastes.
Tanks	Subpart J	Establish standards for tank storage and handling.	May be ARARs if an alternative would involve use of tanks to treat or store hazardous materials.
Surface Impoundments	Subpart K	Establishes standards for surface-impounded wastes.	Not an ARAR because alternatives would not involve a surface impoundment to treat, store, or dispose of hazardous materials
Waste Piles	Subpart L	Established standards for managing wastes in piles.	Not an ARAR because alternatives would not treat or store hazardous materials in piles.
Land Treatment	Subpart M	Establishes standards for managing land treatment.	Not an ARAR because alternatives would not involve on-site treatment.
Landfills	Subpart N	Establishes standards for managing landfills.	May be ARAR if an alternative would involve disposal of hazardous materials in a landfill.
Incinerators	Subpart O	Establishes standards for incineration of wastes.	May be ARARs if an incinerator alternative is selected.
Interim Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 265	Establishes minimum national standards that define the acceptable management of hazardous wastes during the period of interim status and until certification of final closure or if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.	Remedies should be consistent with the more stringent Part 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	40 CFR 266	Establishes requirements that apply to recyclable materials that are reclaimed to recover economically significant amounts of precious metals.	Does not establish additional cleanup requirements.

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Table 10

Action Specific ARARs

Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 CFR 267	Establishes minimum standards that define acceptable management of hazardous wastes for new land disposal facilities.	Remedies should be consistent with the more stringent Part 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and the environment.
Land Disposal Restrictions	40 CFR 268	Identifies hazardous wastes that are restricted from land disposal and describes those circumstances under which an otherwise prohibited waste may be disposed of on land.	An ARAR because alternatives include land application of wastes.
Hazardous Waste Permit Program	40 CFR 270	Establishes provisions covering basic EPA permitting requirements.	A permit is not required for on-site CERCLA response actions. Substantive requirements are addressed in 40 CFR 264.
Underground Storage Tanks	40 CFR 280	Establishes regulations related to underground storage tanks (USTs).	No alternative involving the use of USTs is anticipated.
Resource Conservation and Recovery Act (RCRA) Rule Change	57 FR 37193	Addresses the LDRs for hazardous debris.	An RAR because debris is present.
Corrective Action Management Units (CAMUs) and Temporary Units (Tus)	40 CFR, Subpart S, Part 264	Enables availability of CAMUs to those who initiate corrective action and seek agency approval under RCRA.	Not an ARAR.
RCRA LDRs, Phase II	57 FR 27880, 30657, 37284, 47376, and 6149	Establishes a list of items considered industrial waste as a solid or hazardous waste.	Not applicable because there will be no ongoing commercial activity.
RCRA LDRs, Phase II	57 FR 12	EPA clarification that a waste is not presumptively hazardous merely because it contains as Appendix VIII hazardous waste constituent.	Applicable is ongoing commercial activity occurs.
RCRA LDRs, Phase II	57 FR 21524 as corrected by 57 FR 29220	Establishes management standards for recycled oils.	Not applicable because recycled oils are not present.
RCRA	40 CFR 265	Establishes organic air emission standards for tanks, surface impoundments, and containers.	Applicable to hazardous waste treatment, storage, and disposal facilities (TSDFs) that receive new or re-issued permits or Class 3 modifications after 5 January 1995

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Table 10

Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
RCRA LDRs, Phase II	EPA, 976 F.2d 2, 17-18 (D.C. Cir 1992)	Establishes universal treatment standards and treatment standards for organic toxicity characteristic wastes and newly listed wastes.	May be applicable to listed or characteristically hazardous wastes for which a treatment standard has been promulgated, landfilling is planned, and the CAMU/TU regulations do not apply.
RCRA LDRs, Phase IV	40 CFR 268.30 and 268.40	Establishes specific land disposal prohibitions and treatment standards for wood-preserving wastes.	An ARAR because response actions will involve off-site treatment and disposal of F034 wastes.
Occupational Safety and Health Act (OSHA)	29 USC 651-578	Regulates worker health and safety.	Under 40 CFR 300.38, requirements of the act apply to all response activities under the NCP.
Safe Drinking Water Act (SDWA)	40 CFR 144-147		
Underground Injection Control Regulations	40 CFR 144-147	Provides for protection of underground sources of drinking water.	Not an ARAR because response action does not involve groundwater remediation.
Hazardous Materials Transportation Act (HMTA)	49 USC 1801-1813		
Hazardous Material Transportation Regulations	49 CFR 107, 171-177	Regulates transportation of hazardous materials.	An ARAR because response action would involve transportation of hazardous materials.
Clean Air Act (CAA)	42 USC 7401		
Permitting	40 CFR 61	Requires permits for the discharge of pollutants for point sources, area sources, or fugitive emissions.	Substantive requirements for a permit will be required for discharge from the evacuation enclosure.

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Table 10

Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Discharge of Groundwater or Wastewater				
Federal Clean Water Act	National Pollution Discharge Elimination System (NPDES)	40 CFR 122 and 125	Issues permits for discharge into navigable waters. Establishes criteria and standards for imposing treatment requirements on permits.	Disposal of groundwater to the surface water. NPDES permit may not be required since New Jersey has an approved SPDES permit program (NJDPES)
Federal Clean Water Act	General Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403	Prohibits discharge of pollutants to a POTW which cause or may cause pass-through or interference with operations of the POTW.	Discharge of pollutants including those that could cause fire or explosion or result in toxic vapors or fumes to POTW.
Federal Clean Water Act	Effluent Guidelines and Standards for the Point Source Category	40 CFR 414	Requires specific effluent characteristics for discharge under NPDES permits.	Disposal of groundwater to the surface water. NPDES permit may not be required since New Jersey has an approved SPDES permit program (NJDPES).
Federal Safe Drinking Water Act	Underground Injection Control Program	40 CFR 144	Establishes performance standards, well requirements, and permitting requirements for groundwater re-injection wells.	Discharge of treated groundwater to potable water supply aquifer. May also apply to the injection of surfaciants or oxidants into the aquifer.
Federal Clean Water Act	Ambient Water Quality Criteria	40 CFR 131.36	Establishes criteria for surface water quality based on toxicity to aquatic organisms and human health.	Groundwater discharge to surface water. Federally-approved New Jersey groundwater and surface water standards take precedence over the Federal criteria.
Federal Clean Water Act	Water Quality Criteria Summary		Includes non-promulagated guidance values for surface water based on toxicity to aquatic organisms and human health. Issued by th EPA office of Science and Technology, Health and Ecological Criteria Division.	Groundwater discharge to surface water. Supplements above-referenced Ambient Water Criteria.
State of New Jersey Statutes and Rules	The New Jersey Pollutant Discharge Elimination System	N.J.A.C. 7:14A The New Jersey Pollutant Discharge Elimination System	Establishes standards for discharge of pollutants to surface and groundwaters.	New Jersey has a state approved program. Disposal of treated groundwater to surface water.
State of New Jersey Statutes and Rules	Groundwater Quality Standards	N.J.A.C. 7:9-6 Groundwater Quality Standards	Establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups and discharges to groundwater.	Disposal of treated groundwater by reinjection
State of New Jersey Statutes and Rules	Surface Water Quality Standards	N.J.A.C. 7:9B Surface Water Quality Standards	Establishes standards for the protection and enhancement of surface water resources.	Disposal of treated groundwater by discharge to surface water

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Table 10

Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Disposal of Hazardous Waste				
Federal Resource Conservation and Recovery Act	Identification and Listing of Hazardous Waste	40 CFR 261	Identifies solid wastes which are subject to regulation as hazardous wastes.	Generation os a hazardous waste possibly including spent carbon or contaminated soil. Hazardous waste must be handled and disposed of in accordance with RCRA. Chemical testing and characterization of waste required.
Federal Resource Conservation and Recovery Act	Standards Applicable to Generators of Hazardous Waste	40 CFR 262	Establishes requirements (e.g., EPA ID numbers and manifests) for generators of hazardous waste.	Waste that is characterized as hazardous.
Federal Resource Conservation and Recovery Act	Standards Applicable to Transporters of Hazardous Waste	40 CFR 263	Establishes standards which apply to persons transporting manifested hazardous waste within the United States.	Transport of waste that is characterized as hazardous.
Federal Resource Conservation and Recovery Act	Standards Applicable to Owners and Operators of Treatment, Storagem and Disposal Facilities	40 CFR 264	Establishes the minimum national standards which define acceptable management of hazardous waste.	Generation and storage of hazardous waste. May not apply to remediation sites if owner complies with requirements listed in 264, 1(j).
Federal Resource Conservation and Recovery Act	Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 265	Establishes minimum national standards that define the perios of interim status and until certification of final closure or if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.	Remedies should be consistent with the more stringent PART 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Federal Resource Conservation and Recovery Act	Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 CFR 267	Establishes minimum standards that define acceptable management of hazardous wastes for new land disposal facilities.	Remedies should be consistent with the more stringent PART 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Federal Resource Conservation and Recovery Act	Land Disposal Restrictions	40 CFR 268	Identifies hazardous wastes which are restricted from land disposal. All listed and characteristic hazardous waste or soil or debris contaminated by a RCRA hazardous waste and removed from a CERCLA site may not be land disposed until treated as required by LDRs.	Waste disposed as a RCRA waste

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Table 10

Potential Action-Specific ARARs

Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Disposal of Hazardous Waste (continued)				
Federal Resource Conservation and Recovery Act	Hazardous Waste Permit Program	40 CFR 270	Establishes provisions covering basic EPA permitting requirements.	A permit is not required for on-site CERCLA response actions. Substantive requirements are added in 40 CFR 264.
State of New Jersey Statutes and Rules	Hazardous Waste	N.J.A.C. 7:26C Hazardous Waste	Establishes rules for the operation of hazardous waste facilities in the state of New Jersey	
Federal Resource Conservation and Recovery Act	RCRA	40 CFR 265	Establishes organic air emission stndards for tanks, surface impoundments, and containers.	Applicable to hazardous waste treatment, storage, and disposal facilities (TSDFs) that receive new or re-issued permits or Class 3 modifications after 5 January 1995.
Federal Hazardous Material Transportation Act	Hazardous Materials Transportation Regulations	49 CFR 107, 171-177	Regulates transportation of hazardous materials.	An ARAR because response action would involve transportation of hazardous materials.
General Remediation				
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Superfund Amendments and Reauthorization Act of 1986 (SARA)	National Contingency Plan	40 CFR 300, Subpart E	Outlines procedures for remedial actions and for planning and implementing off-site removal actions.	
State of New Jersey Statutes and Rules	Technical Requirements for Site Remediation	N.J.A.C. 7:26E Technical Requirements for Site Remediation	Established minimum regulatory requiremetns for investigation and remediation of contaminated sites in New Jersey.	
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1904	Requiremetns for recording and reporting occupation injuries and illnesses	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1910	Specifies minimum requirements to maintain worker health and safety during hazardous waste operations. Includes training requiremtns and construction safety requirements.	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.

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Table 10

Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1926	Safety and health regulations for construction.	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.

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Table 10

Potential Action-Specific ARARs

Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
On-site Construction Activities				
New Jersey Uniform Construction Code	Establishes standards for all new construction and renovation.	N.J.A.C. 5:23	Establishes standards for all new construction and renovation.	This may be an ARAR to the extent that new construction falls within the standards.
Off-Gas Management				
Federal Clean Air Act	National Primary and Secondary Ambient Air Quality Standards	40 CFR 50	Establishes emission limits for six pollutants (SO2, PM10, CO, O3, NO2, and Pb).	Emission of ozone (O3) may be of concern for some remedial technologies utilizing ozone as an oxidizing agent. National limit is 8-hour, 0:08 ppm standard.
Federal Clean Air Act	Standards of Performance for New Stationary Sources	40 CFR 60	Provides emissions requirements for new staionary sources.	
Federal Clean Air Act	National Emission Standards for Hazardous Air Pollutants	40 CFR 61	Provides emission standards for 8 contaminants including benzene and vinyl chloride. Identifies 25 additional contaminants, as having serious health effects but does not provide emission standards for these contaminants.	
State of New Jersey Statutes and Rules	Standards for Hazardous Air Pollutants	N.J.A.C. 7:27 Air Pollution Control	Rule that govern the emitting of and such activities that result in the introductin of contaminants into the ambient atmosphere.	

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Table 10

Potential Location-Specific ARARs
Martin Aaron Superfund Site

Type	Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Within 100-Year Floodplain	New Jersey Flood Hazard Control Act	Floodplain Use and Limitations	N.J.A.C. 7:13 Flood Hazard Area Control	State standards for activities within flood plains.	An ARAR for those aspects of the site work that are within the flood plains.
Within 100-Year Floodplain	Federal National Environmental Policy Act (NEPA)	Statement of Procedures on Floodplain Management and Wetlands Protection	40 CFR 6, Appendix A	Establishes EPA policy and guidance for carrying out Executive Order 11988 - Protection of Floodplains and Executive Order Action must avoid adverse effects, minimize potential harm and restore and preserve natural and beneficial values of the floodplain.	Action will occur ina floodplain (lowlands and relatively flat areas adjoining inland) and coastal water and other flood-prone areas.
Wetlands	New Jersey Freshwater Protection Act		N.J.S.A. 13:9B-1; N.J.A.C. 7:7A	Require permits for regulated activity disturbing wetlands.	Potentially applicable for construction activities performed in the vicinity of a wetland or waterway.
Wetlands	Federal National Environmental Policy Act (NEPA)	Statement of Procedures on Floodplain Management and Wetlands Protection	40 CFR 6, Appendix A	11990 - Protection of Wetlands	Wetlands are defined by Executive Order 11990, Section 7 are present at or adjacent to the site.
Area Affecting Strem or River	Federal Clean Water Act	Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredge or Fill Material; Section 404 (c) Procedures; 404 Program Definitions; 404 State Program Regulations	40 CFR 230-233	Restricts discharge of dredged or fill material to wetlands or waters of the United States. Provides permitting program for situations with no other practical alternative.	Potentially applicable for construction activities performed in the vicinity of a wetland or waterway.
Area Affecting Strem or River	Federal Endangered and Non-Game Species Act	Protection of threatened and endangered species	N.J.S.A. 23:2A-1	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site
Area Affecting Strem or River	Federal Endangered Species Act	Protection of threatened and endangered species	16 USC 1531 et seq.; 40 CFR 400	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site
Area Affecting Strem or River	Federal Fish and Wildlife Conservation Act	Statement of Procedures for Non-game Fish and Wildlife Protection	16 USC 2901 et seq.	Establishes EPA policy and guidance for promoting the conservation of non-game fish and wildlife and their habitats. Action must protect fish or wildlife.	Potentially applicable for construction activities which may impact non-game fish and wildlife and their habitats.

Table 10

Potential Location-Specific ARARs
Martin Aaron Superfund Site

Federal National Historic Preservation Act	Procedures for preservation of historical and archaeological data	16 USC 469 et seq.; 40 CFR 6301(c)	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	If historical or archaeological data could potentially be encountered during remediation.

APPENDIX III
ADMINISTRATIVE RECORD
INDEX

MARTIN AARON SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300001 - 300527 Report: Draft Remedial Investigation Report for Remedial Investigation/Remedial Alternatives Analysis of Martin Aaron Site, Camden City, Camden County, New Jersey, Volume I, prepared by L. Robert Kimball & Associates, prepared for State of New Jersey Department of Environmental Protection, Division of Publicly Funded Site Remediation, Trenton, New Jersey, June 2000.

P. 300528 - 300813 Report: Draft Remedial Investigation Report for Remedial Investigation/Remedial Alternatives Analysis of Martin Aaron Site, Camden City, Camden County, New Jersey, Volume II, prepared by L. Robert Kimball & Associates, prepared for State of New Jersey Department of Environmental Protection, Division of Publicly Funded Site Remediation, Trenton, New Jersey, June 2000.

P. 300814 - 301855 Report: Human Health Risk Assessment, Martin Aaron Superfund Site, Camden, New Jersey, prepared by CH2MHill, prepared for U.S. EPA, Region 2, May 2004.

P. 301856 - 302186 Report: Remedial Investigation Report, Martin Aaron Superfund Site, Camden, New Jersey, Volume 1 of 2, prepared by CH2MHill, prepared for U.S. EPA, Region 2, December 2004.

P. 302187 - 303088 Report: Remedial Investigation Report, Martin Aaron Superfund Site, Camden, New Jersey, Volume 2 of 2, prepared by CH2MHill, prepared for U.S. EPA, Region 2, December 2004.

P. 303089 - 303259 Report: Screening-Level Ecological Assessment (SLERA), Martin Aaron Superfund Site, Camden, New Jersey, prepared by CH2MHill, prepared for U.S. EPA, Region 2, December 2004.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400149 Report: Draft Final Feasibility Study, Martin Aaron Superfund Site, Camden, New Jersey, prepared by CH2MHill, prepared for U.S. EPA, Region 2, July 2005.

7.0 ENFORCEMENT

7.8 Correspondence

P. 700001 - 700055 Letter to Michael J. van Itallie, Esquire, Assistant Regional Counsel, U.S. EPA, Region 2, from Mr. Louis M. DeStefano, Klett Rooney Lieber & Schorling, re: Martin Aaron Superfund Site, July 19, 2005. (Enclosure: Report: Summary of Historical Ownership and Uses of the Martin Aaron Superfund Site and Select Nearby Properties, prepared by de maximis, inc., July 19, 2005.)

10.0 PUBLIC PARTICIPATION

10.3 Public Notices

P. 10.00001- 10.00001 Notice: EPA is hosting a Public Meeting for the Martin Aaron Superfund Site, July 26, 2005.

10.9 Proposed Plan

P. 10.00002- 10.00026 Superfund Program Proposed Plan, Martin Aaron Superfund Site, prepared by U.S. EPA, Region 2, July 2005.

APPENDIX IV
STATE LETTER

State of New Jersey
Department of Environmental Protection

Richard J. Codey
Acting Governor

Bradley M. Campbell
Commissioner

SEP 20 2005

Honorable Alan J. Steinberg, Regional Administrator
United States Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

Subject: Record of Decision (ROD)
Martin Aaron Superfund Site
City of Camden, Camden County

Dear Mr. Steinberg:

The New Jersey Department of Environmental Protection (Department) has completed its review of the September 2005 Draft Record of Decision (ROD) for the Martin Aaron Superfund Site. We are pleased to concur with the chosen remedial alternative.

The major components of the selected remedy include:

1. Excavation of approximately 28,000 cubic yards of highly contaminated soil from the arsenic and VOC source areas.
2. Capping of the residual soil contamination that still poses a direct contact threat.
3. Off-site transportation and disposal of contaminated soil and debris, with treatment of all RCRA-hazardous wastes prior to land disposal, as necessary.
4. Backfilling and grading of all excavated areas with clean fill.
5. Installation of groundwater extraction wells to extract and pre-treat the contaminated groundwater, as necessary, prior to discharge to the local municipality.
6. Implementation of a long-term groundwater sampling and analysis program to assess migration and possible attenuation of the groundwater contamination over time, and
7. Institutional controls, such as a deed notice or covenant, to prevent exposure to residual soils that may exceed levels that would allow for unrestricted use, and include a Classification Exception Area, to restrict the installation of wells and the use of groundwater in the area of groundwater contamination.

We appreciate the opportunity to participate in the remedial decision making process and the efforts of USEPA to address this contaminated site.

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If you have any questions, please do not hesitate to call me at (609) 292-1250.

Sincerely,

Joseph J. Seebode, Assistant Commissioner
Site Remediation and Waste Management Program

cc: Mark Austin, USEPA
Anton Navarajah, NJDEP BCM
Ann Charles, NJDEP BEERA
David Van Eck, NJDEP BGWPA

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APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY
Martin Aaron Site
Camden, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for the Martin Aaron site, and EPA's responses to those comments. At the time of the public comment period, EPA proposed preferred alternatives for remediating soils and groundwater. All comments summarized in this document have been considered in EPA's final decision for the selection of remedial alternatives for the site.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community involvement and interests regarding the Martin Aaron site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES: This section contains summaries of oral comments received by EPA at the public meeting, EPA's responses to these comments, as well as responses to written comments received during the public comment period.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for this site. They are as follows:

Attachment A contains the Proposed Plan that was distributed to the public for review and comment;

Attachment B contains the public notices that appeared in the Courier-Post;

Attachment C contains the transcripts of the public meeting; and,

Attachment D contains the written comments received by EPA during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Early in the RI/FS, EPA met with residents and local interest groups to learn about the concerns of the community. EPA has also met Camden officials on several occasions to discuss the site. One of the issues discussed was the city's plans for

future land use of the site and neighboring parcels. EPA plans to coordinate closely with the city to determine how best to fit EPA's cleanup plans for the site into the city's master plan.

On July 15, 2005, EPA released the Proposed Plan and supporting documentation for the soil and groundwater remedy to the public for comment. EPA made these documents available to the public in the administrative record repositories maintained at the EPA Region II office (290 Broadway, New York, New York) and the Camden Free Public Library (418 Federal Street, Camden, New Jersey). EPA published a notice of availability involving these documents in the Courier-Post newspaper, and opened a public comment period on the documents from July 15, 2005 to August 15, 2005. On July 26, 2005, EPA received a request for an extension of the public comment period, and on August 12, 2005, EPA published a notice of the extension of the public comment period to September 14, 2005, in the Courier-Post newspaper.

On July 26, 2005, EPA held a public meeting at the auditorium of the Camden County Municipal Utilities Authority (CCMUA) to inform local officials and interested residents about the Superfund process, to present the preferred remedial alternatives for the site, solicit oral comment, and respond to any questions.

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

PART 1: Verbal Comments

This section summarizes comments received from the public during the public comment period along with EPA's responses.

A. SUMMARY OF QUESTIONS AND EPA's RESPONSES FROM THE PUBLIC MEETING CONCERNING THE MARTIN AARON SITE - JULY 26, 2005

A public meeting was held July 26, 2005, at 7:00 p.m. at the CCMUA Auditorium, 1645 Ferry Avenue, Camden, New Jersey. Following a brief presentation of the investigation findings, EPA presented the Proposed Plan and preferred alternatives for the site, received comments from meeting participants, and responded to questions regarding the remedial alternatives under consideration.

Although the purpose of the public meeting was to accept public comments on EPA's preferred remedy for Martin Aaron site, EPA also made a brief presentation regarding the current status of the Welsbach/General Gas Mantle site, which is partially located in Camden, and accepted questions/comments about a Proposed Plan for that site. Attachment C includes the entire transcript of

the public meeting. The discussion below addresses comments and questions related to the Martin Aaron site.

Comments and questions raised by the public following EPA's presentation are categorized by relevant topics and presented as follows:

a. Clarifying Questions Regarding the Proposed Plan
b. Remediation Goals for Soil & Future Land Use
c. Vapor Intrusion
d. Groundwater Remedies
e. Funding a Cleanup and Potentially Responsible Parties
f. Environmental Justice Concerns
g. South Jersey Port Corporation Property
h. Risk Assessment

a. Clarifying Questions Regarding the Proposed Plan

A number of questions were asked at the public meeting regarding information in the Proposed Plan, including several errors that were identified. Below is a summary of those questions.

Comment #1: *A number of commenters requested that EPA extend the public comment period.*

EPA response: EPA extended the public comment period by 30 days, to September 14, 2005, in response to the requests received at the public meeting.

Comment #2: *A representative of an Environmental Group asked about historic fill. The Proposed Plan discusses "historic fill", and New Jersey's definition of historic fill is very specific. New Jersey technical regulations excludes from "historic fill" ores and slags and other things from processing of metals, such as the chromium contamination found in Jersey City, New Jersey, and the thorium slag found in Camden and Gloucester City. What kind of material was found at Martin Aaron? Was it coal ash?*

EPA response: The New Jersey Technical Regulations identify "historic fill material" as non-indigenous material placed on a site in order to raise the topographic elevation of the site. New Jersey has identified this part of Camden as underlain with "historic fill," and it is not attributable to metal processing or coal ash.

Comment #3: *A representative of an Environmental Group mentioned that the Proposed Plan identified a construction time frame of*

five months for Alternative S4 and four years for Alternative S6. He asked if this was correct?

EPA response: The Proposed Plan included the incorrect time frame for Alternative S6. The Feasibility Study Report estimated the time frame for construction at six months, just a little longer than Alternative S4. While this error is unfortunate, EPA did not base its preference for Alternative S4 over other alternatives based upon its shorter construction time frame.

Comment #4: *A few commenters from an Environmental Group asked about the possible presence of radiological contamination at Martin Aaron. Questions included: did EPA perform radiological sampling at the Martin Aaron site?; was the groundwater sampled for radionuclides?; if there was groundwater contamination, were the results below drinking water standards?; and, did EPA use appropriate testing protocols for radionuclide testing of the groundwater?*

EPA response: Radiological field screening was performed during the Remedial Investigation (RI) field activities at the Martin Aaron Site. Due to the presence of soil with elevated levels of radioactive thorium at the nearby Welsbach/General Gas Mantle site, radiation detectors were used during sampling of surface and subsurface soil at the Martin Aaron site. None of the measurements exceeded ambient, or background, levels of radiation in surface or subsurface soils, as described on Page 3-3 of the Remedial Investigation (RI) Report. As the screening process did not reveal any elevated levels of radioactivity in the onsite surface and subsurface soils, a source of radioactive material is not likely to exist at the Martin Aaron site.

Comment #5: *One representative of an Environmental Group pointed out that in the Proposed Plan some information was incomplete. Specifically, the acronym "NCP" was not previously explained on page 6 and, on page 7, the last sentence in the box, called "What is risk and how is it calculated?", was missing some text.*

EPA response: NCP is short for National Oil and Hazardous Substances Pollution Contingency Plan. The last sentence in the box should read "The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur."

Comment #6: *A member of an Environmental Group asked what was meant, on Page 5 of the Proposed Plan, when EPA stated that "groundwater flow is being influenced by the municipal wells?"*

EPA response: During EPA's RI of hydrogeological conditions at the site, it was determined through observations and measurements that the regional groundwater flow, in general, is to the east-southeast in the hydrogeologic units evaluated. The groundwater flow appears to be heavily influenced to the east by groundwater withdrawal at various public and industrial supply wells located east of the site.

Comment #7: *One member ~~of~~ an Environmental Group asserted that the Preferred Remedy is cost driven. Since the cost would be less for the Preferred Remedy, the best possible cleanup cannot be selected.*

EPA response: While EPA agrees that one of the nine evaluating criteria does compare the costs of each alternative, it is not the sole reason for overall remedy selection.

Comment #8: *Another member of an Environmental Group asked why there is no list of the VOCs in the Proposed Plan.*

EPA response: The primary VOCs found in soils and groundwater are included in the Proposed Plan on pages 21 and 22, and a complete list of the VOCs found on the Martin Aaron site can be found in the RI/FS located in the repositories.

Comment #9: *A member of an Environmental Group asked EPA to put all the documents for this site on the worldwide web, so that people in other parts of the country can look at what's happening here and compare it to their site.*

EPA response: The Proposed Plan for this site can be currently viewed on the web. EPA currently does not, as a general practice, place administrative records on the worldwide web, though electronic repositories have been established on a case-by-case basis when there is a broad interest in a particular issue. Any interested party can request the information through the Freedom of Information Act.

b. Remediation Goals for Soils/Future Land Use

Comment #10: *A representative of an Environmental Group questioned EPA's preferred soil remedy. Stating that Alternative S4, identifies an estimated 28,000 cubic yards of contaminated soil that would be removed. Is that volume of soil based on using 300 parts per million (300 ppm) of total arsenic as a cleanup goal to distinguish site versus historic fill? How deep would excavation be required?*

EPA response: The volume of soil in Alternative S4 is based upon the estimated volume of VOC-contaminated soil exceeding 1 ppm and of arsenic-contaminated soil exceeding 300 ppm. EPA is recommending a direct-contact Cleanup Goal of 20 ppm for arsenic in surface soils and, in Alternative S4, would rely on capping and institutional controls for all soils exceeding 20 ppm arsenic that remain at the site at the completion of the remedial action. The deepest soils exceeding 300 ppm were found at approximately six to eight feet below the ground surface.

Comment #11: *One representative of an Environmental Group asked if capping of the site would require, under New Jersey regulations, a certification of the institutional and engineering controls every two years, not every five years as mentioned in the Proposed Plan. Also, what agency would be responsible for these reviews?*

EPA response: For any remedy that results in contaminants remaining on site at levels that would not allow for unlimited use, a review of the site at least every five years would be required under EPA's Superfund regulations. New Jersey's Technical Regulations for Site Remediation have similar requirements for remedies that rely on engineering controls and institutional controls, such as a deed notice. New Jersey regulations require a performing party to certify that the engineering controls are still in place and are protective every two years. EPA's preferred remedy would be subject to both these review requirements. Since EPA is the lead agency for this site, EPA would be performing the five-year reviews, and NJDEP would be responsible to oversee the two-year certification requirements.

Comment #12: *A representative of two community groups restated that EPA is proposing a Cleanup Goal of 300 ppm when the New Jersey Non-residential Soil Cleanup Criteria is 20 ppm. Table 1 of the Proposed Plan compares the New Jersey Non-residential Soil Cleanup Criteria, the source area Cleanup Goals, and the direct contact standard, which is 1.6 ppm. For vinyl chloride, Table 1 identifies that the EPA direct contact is 0.75 ppm, New Jersey Non-residential soil cleanup criterion is 7 ppm, and EPA is proposing 10 ppm. From the perspective of the community, if it's a health hazard, if it's contaminating the groundwater, if it's not allowing full reuse of the site, it's a problem and at the very least it should be cleaned up to appropriate standards.*

EPA response: The Proposed Plan identified the following remediation goals for arsenic: a direct-contact Cleanup Goal of 20 ppm; and a source area Cleanup Goal of 300 ppm. NJDEP's arsenic criterion of 20 ppm is derived from background arsenic

concentrations found throughout New Jersey. EPA evaluated the level of arsenic contamination across the study area and concluded that concentrations greater than 300 ppm are probably associated with both the tannery and drum reconditioning operations. Therefore, all soil with concentrations of arsenic greater than 20 ppm will be remediated, either by capping or through off-site treatment and disposal.

The Proposed Plan also identified, for vinyl chloride, a direct-contact Cleanup Goal of 0.75 ppm and a source area Cleanup Goal of 10 ppm. Again, all soil with concentrations of vinyl chloride greater than 0.75 ppm will be remediated, either by capping or through off-site treatment and disposal.

Comment #13: *A representative of an environmental group inquired about the Superfund law itself. Environmental advocacy groups, citizen groups have felt from its inception that there shouldn't be different standards of cleanup based on future use, and that cleanup standards should be to the best cleanup standard, health-based standards that would allow for unrestricted use. Also stating that this area is an unfairly burdened community.*

EPA response: Consistent with EPA guidance, as part of the Remedial Investigation, EPA conducted a baseline human health risk assessment (BHHRA) to estimate the potential current and future effects of site contaminants on human health. The BHHRA estimates the human health risk which could result from the contamination at the site if no remedial action were taken. The conditions under which exposure to contamination might occur under current or future uses of the site and affected groundwater were considered. This "exposure assessment", which estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed, is based upon current conditions and realistic assessments of the likely future uses, which are derived from knowledge of current conditions at the site and of assessments of reasonably conservative future-use assumptions. Since the owner of record has either deferred to the City of Camden or is not in a position to plan future use of the property, EPA requested the City fo Camden's input on the future use and the City of Camden Redevelopment plans. Camden indicated to EPA that this site's future use is planned to be light industrial/commercial, including the possibility of a farmers market, but that among the possible end uses, unrestricted land use (e.g., subdivision and resale as individual residential lots) was not contemplated. Full remediation under light industrial conditions was proposed and presented in the Proposed Plan and Feasibility Study as Alternative S6. It was compared against five other alternatives along evaluated in

accordance with the National Contingency Plan's nine criteria. For a number of reasons discussed in the "Comparison of Alternatives" section of the Decision Summary, Alternative S4 was determined to be the Preferred Alternative.

Under EPA's preferred Alternative S4, residual soil contamination would be capped, and a land use control such as a deed notice would be necessary assure that the engineering controls are maintained and that the land use would be limited over time. Institutional controls are a well-established tool for controlling land use in perpetuity.

c. Vapor Intrusion

Comment #14: *Several representatives of environmental groups asked about vapor intrusion as a potential exposure pathway for residents in the area and whether or not EPA has addressed this issue in the current site assessment, whether vapor intrusion sampling had been performed at residences in the area of the VOC plume, and whether that should be a high priority for the Agency.*

EPA response: As a first step, EPA uses the data results from the RI/FS when addressing site impacts to the residential community surrounding the site. EPA found that the concentrations of VOCs in the groundwater are at levels that could potentially result in exposures to indoor vapors under certain conditions. EPA's draft 2002 Vapor Intrusion Guidance recommends a screening approach for sites with conditions similar to this one. EPA reviewed the available data from the RI/FS and concluded that there is not an immediate threat to public health in the environment from the vapor intrusion pathway; therefore, immediate sampling activities in nearby homes are not necessary at this time. To date, no vapor intrusion screening samples have been collected. However, the Proposed Plan identifies vapor intrusion into new or existing structures on site as a potential exposure pathway for VOCs in groundwater. As part of the near term remedial design activities, EPA will continue to analyze the current and future data to assess whether or not sampling is warranted in nearby residential dwellings.

Comment #15: *Another representative of an environmental group asked since vapor intrusion is now being looked at as a significant exposure pathway for public health and to wait until the data shows eminent harm or that the potential for eminent harm may be exposing these residents, could EPA bring sampling equipment for a quick evaluation?*

EPA response: EPA has already looked at where the highest concentrations of VOCs were found. A review has been performed in order to answer questions such as, where is the plume, where are the highest concentrations of contaminants in the plume, where are the highest concentrations relative to occupied buildings, residential buildings, commercial buildings, what is the likelihood that the vapor intrusion phenomenon or that fate and transport pathway is going to occur? These questions need to be answered before any type of immediate sampling inside of homes or businesses would be contemplated. For Martin Aaron, EPA recognizes that the highest concentrations of VOCs in the groundwater are in the shallow Upper Potomac-Raritan-Magothy aquifer and are concentrated in the center of the site where there are no buildings currently in existence. However, EPA recognizes that there are residential properties, some of which are occupied, near the southern portion of this property. The groundwater monitoring wells in this area, while still exceeding the Cleanup Goals in some cases, show a marked decreasing trend from the concentrations at the source areas. EPA believes that it is not necessary to immediately conduct indoor air sampling. However, as previously mentioned, the Proposed Plan identifies vapor intrusion into new or existing structures on site as a potential exposure pathway for VOCs in groundwater. As part of the near-term remedial design activities, EPA will continue to analyze the current and future data to assess whether or not sampling is warranted in nearby residential dwellings.

d. Groundwater Remedies

Comment #16: *A representative of an environmental group stated that the Proposed Plan identifies all the contamination at the site to be within the upper-most layer of the Potomac-Raritan-Magothy (PRM) aquifer, that the Upper PRM is not used in the area for drinking water, and that there are confining layers between the Upper and Middle PRM aquifers, which is used as a drinking water source. The PRM is notorious for having "holes" in the clay confining units, and the different layers are often connected. How can we be confident that the contamination is stopped by confining layers?*

EPA Response: Based upon review of geological historical data and of EPA's groundwater data, the site contamination has been determined to be within the PRM Aquifer system. The PRM system in the area has been observed to be more than 300 feet thick. Drilling activities encountered the uppermost confining layer as a stiff gray clay at depths between 110 and 129 feet. During drilling activities, the confining layer under the site was determined to range from 20 to 40 feet thick. The confining bed between the Upper and Middle PRM consists of thin- to thick-

bedded silts and clays. Since EPA's sampling results have been able to identify the nature and extent of the VOC and arsenic plumes both horizontally and vertically (note that there is no contamination detected in the deepest monitoring wells), EPA has concluded that the site assessments are accurate.

Comment #17: *A representative of an environmental group asked since EPA found trichloroethylene and tetrachloroethylene in the groundwater along with cis-1,2-dichloroethylene and vinyl chloride, which are biodegradation products of those previous mentioned chlorinated solvents. The pump and treat remedy appears to be a less efficient way of addressing VOCs, when enhancing biodegradation would be more efficient.*

EPA response: As described in the Proposed Plan and explained in more detail in the Feasibility Study report, VOC contamination is amenable to natural attenuation under certain conditions, some of which appear to exist at the site. These natural degradation processes may decrease VOC contamination over time, especially if an active soil remedy is undertaken to address VOC source areas. EPA considered enhanced bioremediation for the VOCs in the FS, but it was not carried forward from the technology screening stage because it would not be effective in addressing the arsenic plume. EPA proposed active pumping (Alternative G5) because it would remove and destroy most of the TCE, cis-1,2-DCE, and vinyl chloride and over 99 percent of the arsenic in groundwater through active pore flushing. Overall, it would speed the recovery of both the arsenic and VOC plumes.

Comment #18: *A representative of an environmental group asked if EPA has a defined end point for Alternative G5, Groundwater Collection and Treatment?*

EPA response: As described in the FS and Proposed Plan, under Alternative G5, groundwater Cleanup Goals are estimated to be achieved in approximately 10 years.

Comment #19: *Several representatives of environmental groups were concerned about the spreading of the contamination in groundwater and that it would eventually keep spreading to all the other communities which would then have to clean up their water.*

EPA response: EPA's selected remedy for contaminated soils would be implemented first, to remove the Source Areas that are believed to be a direct source of groundwater contamination. Once this part of the remedy is completed, the groundwater collection and treatment system would be installed and operated.

EPA believes that once the Source Areas are removed, the groundwater contamination can be treated relatively quickly. EPA also has determined that the arsenic and VOC contamination plumes, though influenced by the pumping of wells to the east, are expanding at rates that can be eventually contained once both the soil and groundwater remedies are in place.

Comment #20: *A representative of an environmental group mentioned that since Camden is already faced with groundwater contamination. Its municipal wells are already contaminated and filters have had to be installed to implement a substantial cleanup. A groundwater remedy that cleans up to drinking water standards should be implemented because future use of the site is not known.*

EPA response: EPA's site sampling has characterized the nature and extent of groundwater contamination, and there is no evidence that it threatens any current or inactive municipal wells. Camden is supplied with drinking water from a system of pumping wells operated by United Water Camden. This water system requires treatment prior to use, but not as a result of Martin Aaron contamination. As part of the RI/FS, EPA sampled the nearest municipal well, the currently inactive City Well #7. EPA's sample results have not detected any Martin Aaron site-related contamination. The selected remedy for groundwater is expected to restore the groundwater to EPA's Cleanup Goals, which are drinking water standards and would allow for future use as a drinking water resource.

Comment #21: *A representative of an environmental group requested that EPA consider a groundwater alternative that treats groundwater on site and then flushes it right back into the ground on site instead of using the Camden County Municipal Utilities Authority, which would address all the groundwater contamination on site without using the sewage treatment* works.

EPA response: The Feasibility Study initially identified general response actions as the first step in selecting an alternative. For each response action, several technologies may exist. These remedial technologies are then screened based on seven criteria. Those remaining options are then assembled into alternatives. After remedial action objectives (RAOs) are developed based upon the site human health risk assessment, general response actions consistent with the RAOs are identified. Groundwater infiltration/injection on the site was not considered implementable due to the higher capital costs and operational requirements for additional treatment to remove metals to low levels. Therefore, treating the groundwater on site as a

pretreatment to discharging to the POTW was retained, but infiltration/injection of the treated groundwater back on site was not.

e. Funding a Cleanup and Potentially Responsible Parties

Comment #22: *A representative of two community groups asked how much money is left in Superfund right now nationwide to do clean up work? Can EPA give some assurance that there is, in fact, funding to remediate the site properly? Is that money already been set aside or are we still in the pipeline? Is there funding for the record of decision or design?*

EPA response: The "Superfund" is replenished primarily from general tax revenues and from settlements with Potential Responsible Parties (PRPs) at Superfund sites, which reimburse EPA for its past costs in cleaning up sites. EPA funds 90 percent of remediation costs at sites where no viable PRPs are available, and the states provide a 10 percent share. At many sites with viable PRPs, EPA seeks settlements whereby the PRPs either perform cleanup work themselves or fund the work, with EPA oversight. At the Martin Aaron site, EPA will pursue the PRPs to fund the remediation.

For this site, funding is currently available through the selection of a remedy. If needed, EPA does not expect that funding of the design will be problematic.

Comment #23: *A concerned citizen and representatives of environmental groups asked about EPA and NJDEP enforcement of the Martin Aaron facility operators and what were the results? There were complaints, 11 notices of violations, two administrative orders, and site inspections however, these facilities continued to operate and were never closed down. Were there any fines paid or any of these conditions remedied?*

EPA response: Regulation and enforcement of rules for operating facilities is primarily under the Resource Conservation Recovery Act within EPA, and under several authorities within NJDEP. The Superfund Program typically addresses releases from defunct or abandoned sites listed on the National Priorities List, and to some degree, the Superfund program acts as a safety net to protect the public from site releases when companies such as Martin Aaron, WADCO and Rhodes Drums fail to meet their obligations.

The regulation of operating facilities yields some facilities such as this one, where fines and notices of violation were

ineffective tools for bringing the regulated company into compliance with applicable environmental statutes. In this case, NJDEP first attempted to get Martin Aaron and WADCO to remediate the site, but those companies were unwilling or unable to perform the work.

Comment #24: *A representative of two community groups asked whether or not the companies that operated on the Martin Aaron site (the Martin Aaron company itself and Rhodes Drums) are still in existence? Are there any indications from either of these potentially responsible parties whether they are going to assume any responsibility or contest responsibility?*

EPA response: EPA issued letters to Martin Aaron, Inc., and Rhodes Drums notifying the companies that they were PRPs and may be liable for payment of response costs for cleanup of the site. After evaluating these entities, EPA concluded that they lacked the financial resources to fund or perform the RI/FS.

Comment #25: *A representative of an environmental group asked who are some of the responsible parties? Is a list available to the public?*

EPA response: EPA has been actively investigating other parties for the site - companies that used the services of the drum reconditioning firms - and has provided notice of potential liability to a group of PRPs. A list of these parties is available on request. These parties were not identified until after the initiation of the RI/FS and, therefore, have yet to be offered an opportunity to perform work at the site.

f. Environmental Justice Concerns

Comment #26: *Many representatives of environmental groups requested that EPA invite the local community to meetings that would allow for community input on the cleanup of the Martin Aaron site.*

EPA response: EPA has attended and is represented at the Waterfront South Science Advisory Committee meetings and had a public availability session to inform the public of the Superfund process and what to expect over the months of EPA's investigation and eventual decisions. In addition, EPA has met with the city to present our findings and EPA's remedy selections. EPA encourages community participation in cleanups and in advising the agency with regard to local concerns. A more active role in the next stage of remedy implementation, remedial design, would be fully supported by EPA.

Comment #27: *A representative of an environmental group asked if EPA factors in air quality in its decision-making, since air quality may be exacerbated by the fact that the air quality in Camden is really not good to begin with?*

EPA response: Air quality conditions factor into remedial decisions and cleanups at NPL sites in several ways. EPA reviews potential contamination impacting an area, including the potential for air-borne contamination from sites, and attempts to identify the contribution from site-related contaminants. EPA then looks at what are the risks associated with the site contaminants now and in the future, if no remedial action occurs, including the potential for air-borne exposure pathways. During remedial alternative evaluation and remedy selection, air-borne effects of various alternatives is considered under "Short-term Effectiveness" among the nine criteria evaluation (please refer to that section of the Decision Summary). During remedial design and construction, safety considerations related to air pathways, such as fugitive dust emissions from excavation activities, are evaluated, and performance of the remedial action is designed to minimize the potential for the release of site contaminants during the cleanup.

Comment #28: *A resident asked if EPA has attempted to locate or identify any residents who may have lived in the vicinity of this site and the many other in waterfront south in order to conduct an assessment of their health?*

EPA response: The Agency for Toxic Substances and Disease Registry (ATSDR), in working with the New Jersey Department of Health and Senior Services, performed a health assessment for Gloucester City and Camden as part of the nearby Welsbach/General Gas Mantle site. They found that there was an increase of cancer in the two areas but that the increase was primarily attributable to smoking. ATSDR did not look at historic exposures in the community.

g. South Jersey Port Corporation Property

Comment #29: *A representative of an environmental group* asked, *"What was so conclusive about the data to separate the South Jersey Port Corporation (SJPC) Site from the Martin Aaron site cleanup?"*

EPA response: Concurrent with EPA's RI/FS, NJDEP and the SJPC property owner evaluated potential remedies for the SJPC property. After evaluating previous site uses, NJDEP concluded that the contamination at the SJPC property could be attributed

to "historic fill" in the area, and not to the Martin Aaron site. Martin Aaron, Inc. only leased part of the SJPC property and sample results in areas used by the Martin Aaron operation had similar results when compared to areas not used by Martin Aaron. NJDEP also concluded that the contamination on the SJPC property, primarily metals and PAHs, did not appear to be a source to the groundwater contamination in the area. Therefore, NJDEP, with EPA's concurrence, plans to proceed with a remedy for the SJPC property, independent of ~~the~~ Martin Aaron site.

Comment #30: *Regarding the off-site contamination underneath the SJPC property. A representative of an environmental group asserted that there is enough soil contamination evidence on the SJPC property to warrant a cleanup over there, especially since the direction of the groundwater flow is going from north to southeast. The plume actually begins over on the SJPC and continues on the Martin Aaron side.*

EPA response: See answer to comment #30, above. In terms of groundwater contamination, there are groundwater monitoring wells currently on the SJPC property that support the groundwater conceptual site model. EPA's sampling results have not indicated that the groundwater contamination is of the same magnitude as the plumes found on Martin Aaron, and groundwater flows from the northwest to the southeast. Therefore, the RI concluded that the contamination originates from Martin Aaron and not the SJPC property, and that there does not appear to be soils that act as continuing sources to the groundwater contamination on that property.

h. Risk Assessment Questions

Comment #31: *A resident mentioned that there are many residents in Waterfront South. EPA should not only consider the commercial value of the cleanup. Even though EPA identified the future land use as commercial, the cleanup affects residents too, and EPA shouldn't forget the residents in developing a protective remedy.*

EPA response: The anticipated future land use is for a commercial or light industrial purpose, consistent with the city's master plan and interviews that EPA has conducted with stakeholders in the area. EPA evaluated potential future land uses and the potentially exposed populations associated with the likely land uses in its baseline human health risk assessment. EPA believes that a remedy that achieves the Remedial Action Objectives listed in the Proposed Plan would be protective for future on-site occupants as well as for the neighboring community.

Comment #32: *A member of an environmental group stated that EPA's investigation determined that metals (antimony, arsenic, barium, cadmium, chromium, lead, mercury, selenium and thallium), VOCs, semi-VOCs (PAHs), pesticides, and PCBs were found on the Martin Aaron site. EPA's health risk assessments do not take into consideration multiple stressors occurring at the same time because the science can't support these types of conditions. Currently, there are no protocols for assessing health consequences when exposed to nine or 10 metals plus an unknown number of pesticides, PCBs, and PAHs.*

EPA response: EPA conducted the risk assessment in accordance with EPA risk assessment policies and guidelines and Superfund guidance. The documents used as the basis of the risk assessment are referenced in the Human Health Risk Assessment Report and include documents available at http://www.epa.gov/superfund/programs/risk/, www.epa.gov/ncea under the publications section, http://cfpub2.epa.gov/ncea/raf under the publications section, and www.epa.gov/iris for specific chemical files. As described on these homepages, EPA's process for developing guidelines and guidance include internal Agency review, Federal Register Notices that make the documents available for public comment, external peer-review (where appropriate), and finalization of the document.

Consistent with the Risk Assessment Guidance for Superfund (EPA, Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), EPA/540/1-89/002, 12/1989), and the Chemical Mixtures Guidelines (Guidelines for the Health Risk Assessment of Chemical Mixtures, EPA/630/R-98/002, 9/1986) and Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures (Risk Assessment Forum, Washington, DC, EPA/630/R-00/002, 2000), and as discussed in the risk assessment (see Section 8.1.1 and 8.1.2 of the Human Health Risk Assessment Report), cancer risks are summed across chemicals and exposure pathways. The calculation of non-cancer health hazards involves a two step process. First, the total Hazard Index is calculated by combining the individual Hazard Quotients across individual chemicals and pathways. Secondly, where the Hazard Index is greater than 1, the chemicals are combined based on similar health endpoints and modes of action. The results of the calculations are provided in the Human Health Risk Assessment Report (Section 8.2 and Tables 7 through 9 of Appendix A). (Note: the Chemical Mixture Guidelines are also available at http://cfpub2.epa.gov/ncea/raf/rafguid.cfm.)

Comment #33: *A member of an environmental group stated that the results of quantitative risk assessment are not reproducible from laboratory to laboratory or from risk assessor to risk assessor.*

The National Academy of Sciences said in 1991, risk assessment techniques are highly speculative and almost all rely on multiple assumptions of fact, some of which are entirely untestable. It doesn't take into consideration multiple exposures, different people can reach different conclusions, there's lots of judgment involved.

EPA response: The risk assessment evaluated critical windows of effect where such studies were available for the chemicals of concern found at the Martin Aaron Superfund site. For example, the evaluation of vinyl chloride, a chemical of concern at the site, is based on an Integrated Risk Information System (IRIS) assessment that provides separate cancer slope factors, based on continuous lifetime exposure from birth and exposure during adulthood (www.epa.gov/iris - chemical file for vinyl chloride). As part of the IRIS process, EPA updates the chemical files as appropriate to address new scientific studies on the chemicals currently on the database. Further, EPA has an ongoing process to update the risk assessment guidelines and guidance documents to address new science as appropriate.

In preparing this response, EPA reviewed the example cited in the comment. EPA is not providing comments specific to this example because it is not relevant to the site-specific conditions. EPA's risk assessment evaluated chemical mixtures using appropriate guidance identified above and using conservative assumptions to calculate cancer risks and non-cancer health hazards. This approach is not in conflict with the example cited by the commenter.

Comment #34: *A member of an environmental group stated that EPA doesn't know what's protective of public health except to not expose people to toxic materials. In EPA's presentation, the words "low levels" are used. EPA doesn't know what is a low level. EPA doesn't know very much about non-cancer affects. In most cases, EPA doesn't even have protocols for determining what will cause a non-cancer effect. EPA doesn't have protocols for determining toxic affects that lead to behavioral changes, so they are left out of the risk assessment.*

EPA response: EPA's evaluation of the toxicity of chemicals at the Martin Aaron site involved the review of toxicity information on all of the individual chemicals found at the site. EPA used toxicity values developed by the Agency at the national level that are applied at EPA Superfund sites across the country. The development of the toxicity values for individual chemicals involves a number of steps. First, the available chemical-specific published peer-reviewed scientific literature is

compiled and reviewed. The published studies include human epidemiological studies, animal toxicity tests, and supporting information. The review process is identified in EPA's Integrated Risk Information System (or IRIS) available at www.epa.gov/iris and the various guidelines available at www.epa.gov/ncea. Second, EPA evaluates numerous peer-reviewed available studies for each individual chemical including data on a wide variety of health endpoints (e.g., neurological, endocrine system, liver, kidney, reproductive, etc.) to identify a critical study and the critical effect. The critical study and the critical effects represent the most sensitive endpoint based on the available scientific literature and serve as the basis for the development of the toxicity values that were used in the Martin Aaron risk assessment. The sources of toxicity information are provided in the Human Health Risk Assessment Report, Section 7.0 and Appendix A, Table 5 for non-cancer health effects and Table 6 for the cancer toxicity and Weight of Evidence descriptors. For the non-cancer health effects, Uncertainty Factors are applied to the dose level associated with the critical effect and the dose level is further reduced to protect sensitive individuals including children. For the cancer assessment, the tumor types are evaluated and the cancer slope factor is determined. The cancer slope factor represents a plausible upper bound estimate of carcinogenic potency which means that EPA is reasonably confident that the actual cancer risk will not exceed the estimated risk calculated using the CSF. For example, the IRIS chemical files used for arsenic, a major contaminant at the site, are available at www.epa.gov/iris. These documents were also identified in the Human Health Risk Assessment Report. Each of these documents includes specific discussions regarding the numerous health effects identified for arsenic based on the available scientific literature. The critical health endpoints for the chemicals of concern are provided in Appendix A, Tables 5.1 and 5.2 for non-cancer and Table 6 for cancer and the calculated cancer risks and non-cancer health hazards (Appendix A, Tables 7 and 8). Although the Human health Risk Assessment Report only lists the critical effects that were combined together for the organ-specific Hazard Index, the development of the toxicity values incorporated information on the other health effects where information was available.

Consistent with EPA Superfund risk assessment guidance including RAGS Part A (available at: www.epa.gov/superfund/programs/risk), the Human Health Risk Assessment evaluates the increased risk above the background cancer. Consistent with the Agency's guidelines on chemical mixtures (described above) the assessment calculated total risk by adding together the cancer risks and non-cancer health hazards from the individual chemicals. EPA's risk assessment evaluated chemical mixtures using appropriate

guidance identified above and using conservative assumptions to calculate cancer risks and non-cancer health hazards. This approach is not in conflict with the processes cited by the commenter.

PART 2: Written Comments

COMMENTS RECEIVED FROM EDISON WETLANDS ASSOCIATION

EPA received comments from the Edison Wetlands Association (EWA) and from a consultant on behalf of EWA. EWA and the consultant, a representative of Chapin Engineering, also made oral comments at the public meeting.

Comment EWA1: *EPA should reconsider choosing alternative S4 in favor of alternative S6. Mr. Chapin brings up the discrepancy in cost for executing soil remediation S4 vs. S6. The basis for selecting the appropriate clean-up method is clearly flawed. Alternative S6, which calls for complete removal of contaminated soil, should be selected.*

EPA response: See EPA response to Chapin Soil Comment #4.

Comment EWA2: *EPA should consider innovative approaches to groundwater cleanup. Methods suggested by Mr. Chapin such as enhanced biodegradation should be studied and proposed as a viable alternative.*

EPA response: See EPA response to Chapin Groundwater Comment #1.

Comment EWA3: *EWA requests EPA to clarify the nature of the historic fill on the site. Without confirming the exact nature of the fill, the 300 ppm goal for arsenic is unjustified.*

EPA response: See EPA response to Chapin Soil Comment #1.

COMMENTS RECEIVED FROM CHAPIN ENGINEERING, ON BEHALF OF EDISON WETLANDS ASSOCIATION

Chapin Soil Comment #1: *The selected alternative for soil remediation, designated S4, specifies removal with off-site transport and disposal of 28,000 cubic yards (CY) of soils contaminated with volatile organics and Arsenic from "sources areas" of the site. A source area is a location where soil contaminants are currently contributing to the groundwater contamination. This represents no more than 0.4 acres (17%) of the site. The balance of the site, approximately 2.0 acres, "…where the soils exceed the Direct Contact Cleanup Goals…",*

would be capped (the type of cap was not specified, but asphalt was assumed for estimating costs). Comparison to Alternative S6 (the total removal option) indicates 36,500 CY of contaminated soils will remain. A Deed Notice is required for the capped area because in-place contaminants will be at levels that will not allow for future unlimited use.

EPA developed direct-contact Cleanup Goals for site contaminants including Arsenic, which ~~is~~ a driving soil cleanup for a portion of the site. These Cleanup Goals include a limit of 300 ppm (parts per million) for Arsenic as a source area Cleanup Goal. The 300 ppm Goal is based on an assessment of site data and history that concluded Arsenic concentrations of 300 ppm or less are due to "historic fill" at the site and in the surrounding area. No discussion is provided to define that type(s) and characteristics of the materials designated as "historic fill".

Historic fill has the following definition in New Jersey. "Historic fill material means non-indigenous material, deposited to raise the topographic elevation of a site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement, and includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid wastes. Historic fill material does not include any material which is substantially chromate production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings. In addition, fill material does not include a municipal solid waste landfill site." (see N.J.A.C. 7:26E-1.8) Removal of Historic Fill is not required, although and institutional and engineering controls are required for sites having Historic Fill Material.

The nature and characteristics of the historic fill underlying the Martin Aaron Superfund Site is critical to evaluating the acceptability of the proposed alternative, S4. Arsenic is a known component of lead ores. A lead smelter operated on the adjacent site east of Sixth Street. Arsenic is attributed to the former tannery operations at the site, but were smelter wastes, which are not, by definition, Historic Fill Material disposed at the site? If so, the presumption of "no removal' of Historic Fill Materials does not apply. In this case, there is no basis for the 300 ppm "hot spot" Cleanup Goal, especially because the EPA's own risk assessment determined the Arsenic direct-contact Cleanup Goal for commercial/industrial use is 1.6 ppm. The currently utilized New Jersey Arsenic Cleanup Criteria is 20 ppm, which was established in 1992 as a Statewide "background" concentration. However, the proposed Soil Cleanup Standard for Arsenic is 8 ppm,

which is also a Statewide "background", but based on a more comprehensive data set than the previous criteria. Unless the basis for designation of on-site materials as Historic Fill Material is clear, there is no justification for use of 300 ppm.

EPA response: EPA has selected the excavation of concentrations of arsenic in soil over 300 ppm based on the collection and evaluation of over 135 surface and subsurface soil samples. As described in the RI, the highest arsenic concentrations on the Martin Aaron property were 766 ppm (surface) and 23,300 ppm (subsurface). By contrast, the maximum concentrations of arsenic collected from other areas of the site, such as the South Jersey Port Corporation (SJPC) property, located on the opposite side of Broadway from Martin Aaron, were as high as 46.4 ppm (surface), and 236 ppm (subsurface). NJDEP concluded that contamination at the SJPC property was probably not the result of operations from the Martin Aaron site or the nearby metal processing facility, and that the contamination was more consistent with "historic fill".

The nature and characteristics of the historic fill material at the Site is well documented. The EPA RI includes the following descriptions of historic fill material at the Site based on the soil descriptions from borings and test pits at the Site:

> Section 4.4.1: Regional Geology - "Intrusive remedial investigation activities conducted during the NJDEP RI (2000) such as test pit excavations indicate that natural soils have been removed from the property and replaced with various fill materials, including: construction debris (bricks, concrete, etc.), ashes and cinders, slag-type material, wood, and refuse. This fill layer ranges from 2 to 7 ft thick and is relatively continuous over the entire property."
>
> Section 4.4.3: Site Geology - "The anthropogenic layer consistently ranges from approximately 6 to 10 ft bgs throughout the Site with the thickest layers located near existing and formerly existing process buildings onto the property. The layer consists mainly of fill material and debris including concrete, asphalt, wood, glass, brick, slag, and fly ash mixed with fine/medium grained sand. This fill material transitions to the Freehold-Downer-Urban land Complex Association, which consists of a grayish brown silt and sand mixture."
>
> Section 9.2: Soil - "The presence of metals and SVOC contamination identified in surface and subsurface soil at Martin Aaron and SJPC may be associated with the ash and

cinders in the anthropogenic layer. The ash and cinders are combustion by-products, and were likely used as fill material at the Site."

In addition, the soil areas exceeding 300 ppm at Martin Aaron were associated with elevated or arsenic Source Area concentrations in groundwater.

Chapin Soil Comment #2: *Welsbach/General Gas Mantle (Welsbach) is another Superfund site located in Camden, NJ, where ore was historically processed to remove Thorium used to manufacture gas mantles. Ore tailings and other radiological wastes were disposed in a number of locations within Camden. Information provided by USEPA on July 26, 2005 indicated the Martin Aaron site is located within study area for the Welsbach Site identified as"Area 1 General Gas Mantle", and that radioactivity had been identified in an old stream bed at the Martin Aaron site. No acknowledgment of this radioactivity is included in the EPA's handout on the Martin Aaron site: why? Given the preferred remedy leaves the majority of soil contamination is place, identification of any and all on-site radioactivity is essential. I also note that any waste from processing of the Thorium ore is not, by definition, a historic fill. Consequently, the presumption of "no removal" would not apply. This information clearly enforces the need for EPA to define the "historic fill" present at the Site.*

EPA response: Radiological field screening was performed during the RI field activities at the Martin Aaron site. None of the measurements exceeded ambient, or background, levels of radiation in surface or subsurface soils, including during the installation of the groundwater monitoring wells. As the screening process did not reveal any elevated levels of radioactivity in the onsite surface and subsurface soils, or the onsite groundwater, a source of radioactive material is not likely to exist at the Martin Aaron site.

Chapin Soil Comment #3: *In general, it is not clear which Cleanup Goal for Arsenic is being used or what the depth of excavation will be completed. Are the two areas identified as "Arsenic Source Areas" on Figure 2 the only locations for removal based on Arsenic? NOTE: The eastern Arsenic Source Area abuts Sixth Street.*

Alternative S4 will include institutional controls, and the EPA specifies a review of the site would be required every 5 years. While a 5 year review may be consistent with National Contingency Plan, New Jersey [specifically the Brownfields Act, N.J.S.A. 58:10B-1 et seq., see the Technical Requirements, N.J.A.C.

7:26-6.4 (g)] requires inspection of the site every 2 years with submission of a certification that the engineering controls are being properly maintained and continue to protect public health, safety and the environment. The O&M costs should be reviewed to ascertain the expense of biennial certifications are included.

EPA response: The details of the excavation of arsenic-contaminated soil at the site are provided in the FS Report, included as part of the Administrative Record for the Site. As part of the remedy, contaminated soil will be excavated to a depth of approximately 10 feet in three VOC Source Areas and two arsenic Source Areas (shown on Figure 4-5 of the FS).

The O&M costs for EPA's proposed remedy includes inspections every two years and Biennial Certifications to NJDEP (Appendix B of the FS Report). The need for a review of the remedy every five years by EPA is not considered an O&M cost.

Chapin Soil Comment #4: *Alternative S4 is scheduled for 5 months, while Alternative S6 will take 4 years. Consider the following: The contractor mobilizes to the site and removes the 28,000 CY specified under S4 in the allotted time. At that point, it is decided to continue excavation until an additional 36,500 CY are removed. How long will that additional excavation require? Under the EPA's assumed times, the additional CY requires over 3 and a half years! The first 28,000 CY took only 5 months. There is something fundamentally wrong with the time frames presented for these two alternatives. An explanation of the basis of the assumed time frames is required. The evaluation of the alternatives must be re-done using realistic time frames.*

<u>Soil Remediation: Comparison of Capital Costs of Alternative S4 to Alternative S6</u>

Alternative S4 specifies partial excavation of contaminated soils in the "source areas of the site" with capping of the remainder that exceed the Cleanup Goals. Alternative S6 specifies removal all soils that exceed the Cleanup Goals. Table 1 summarizes the comparison of the two alternatives.

The comparison is based on total capital costs and the total volume of soil each alternative will remove from the site. Various unit costs were computed. Several unit removal rates were also calculated to gauge estimated efficiency of the alternative. Both alternatives excavate contaminated soils and load that soil into trucks for transport to an off-site disposal site. These alternatives are fundamentally the

same, with the volume of soil being the critical variable. The following conclusions are apparent from Table 1

The average cost of removal (Avg $/CY Removed) is significantly less for Alternative S6.

Considering remedial excavation projects Alternative S4 has a realistic Removal Rate, or it is reasonable to assume that a competent operator(s) can load 9 tandem trailers in a typical work day.

Conversely, Alternative S6 has an unrealistically low Removal Rate. There appears to be a fundamental problem with the time used for S6, unless there are special conditions associated with S6 that have not been provide in the EPA Summary. A justification for the time used for S6 is required, as it likely biased the evaluation of the alternatives.

The average cost per work day (Avg $/Work Day) for alternative S4 is $80,000, an extremely high cost considering the project is only excavation, transport and disposal. (We fully recognize there will be asphalt paving of the site in this alternative, but that would not justify the apparent level of costs.). This extremely high daily cost requires justification.

Conversely, the Alternative S6 has a realistic average cost per work day.

This basic assessment of the costs used to evaluate alternatives found questionable numbers. A detailed assessment of the estimated costs for the Martin Aaron site, including the underlying assumptions for each, should be undertaken to confirm their accuracy.

Execution of Alternative S6 addresses an additional 36,500 CY of contaminated soils, but the average costs the additional soil is only $52 per CY, based on the EPA numbers.

EPA response: The Proposed Plan included the incorrect time frame for Alternative S6. The Feasibility Study Report estimated the time frame for construction at six months, just a little longer than Alternative S4. While this error is unfortunate, EPA did not base its preference for Alternative S4 over other alternatives based upon its shorter construction time frame.

The average cost/Cy for Alternative S6 is less than Alternative S4 because it has a much lower percentage of soil requiring more costly disposal. Under Alternative S6 only 14% of the excavated soil requires solidification and disposal at a Subtitle C landfill at a unit cost of $114/cy compared to 30% of the soil under Alternative S4. The remaining soil under both alternatives is disposed offsite at a Subtitle D landfill (unit cost of $30/Cy).

The total cost of Alternative S6 is $8.3 million for total capital cost and present worth cost. As provided in the PRAP, the O&M for Alternative S6 is $0. The estimated time of construction for Alternative S4 is 5 months as provided in the PRAP.

Chapin Groundwater Comment #1: *The selected alternative for Groundwater cleanup, designated G5, specifies the collection and on-site treatment of groundwater, followed by discharge of the treated groundwater to the Camden County Municipal Utilities Authority (CCMUA) regional wastewater treatment facility. On-site treatment was assumed (for cost estimation purposes) to use air stripping and vapor-phase carbon adsorption to remove volatile organics and chemical precipitation for metals removal. Treatment would achieve the CCMUA pretreatment limits.*

The plume of volatile organics in the shallow groundwater (within 20 feet of the ground surface) is estimated to be 1000 feet long and 600 feet wide. Vertically, the plume extends to 60 feet, but is narrower (400 feet wide). The plume contains Arsenic as well as volatile organics. The contamination is moving southeast with the groundwater flow. The groundwater extraction wells will extend to 50 feet below grade and pump at 85 gpm (gallons per minute).

Assuming the source of the contaminants (on-site contaminated soils) is removed, the EPA estimated the groundwater pump and treatment system will require 10 years to restore the groundwater. The Cleanup Goals for groundwater are indicated to be the Drinking Water Standards or the New Jersey Groundwater Quality Standards. However, the proposed remediation is intended to cleanup groundwater "…to the extent practicable…" and there is no statement as to when the system will be turned off. This is common with a traditional "pump and treat" approach to groundwater cleanup.

There is no discussion on any consideration to addressing groundwater contamination using in-situ biological treatment. Data indicates the plume includes chlorinated solvents

(Trichloroethylene and Tetrachloroethylene) and chlorinated organics that are created by the biodegradation of those chlorinated solvents (cis-1,2-Dichloroethylene and Vinyl Chloride). In-situ bioremediation of the groundwater plume is presently occurring. And it is occurring where Arsenic, an element that will inhibit biological activity, is present at relative high concentrations. Why wasn't enhancement of the current biodegradation process, using a product such as Hydrogen Release Compound®, considered as a means of addressing the chlorinated solvent? Such products are known to be effective. Was a combination of in-situ for the chlorinated plume (that extends 1000 feet) and a less aggressive pump and treat for the Arsenic in the shallow on-site zone considered? Given Alternative G5 has no definable end point and is the highest cost alternative; other innovative options must be considered.

It appears as though only traditional options were considered.

The solvent plume extends 1000 feet to the southeast and is 600 feet wide in the shallow groundwater zone. Are there residential properties above this plume? Have these homes been evaluated for potential vapor intrusion from this plume? There is no discussion of this issue in the EPA Summary, other than a page 9 reference that this potential exposure pathway exists.

Inspection of the area southeast of the Site on July 26, 2005 found occupied residential housing above the solvent plume. These homes must be evaluated for potential vapor intrusion.

All occupied structures underlying the plume must be evaluated to determine if there is a vapor intrusion problem associated with the Martin Aaron site.

If there has been a vapor intrusion evaluation the results of that work must be included in the EPA Summary, which is the main document by which the public is informed of the site, its problems and the proposed cleanup.

EPA response: As shown in Table 3-2 of the FS, a variety of in-situ groundwater treatment options were included in the technology evaluation. These technologies included oxidation, permeable treatment beds, air sparging, steam injection as well as biological methods. Biological methods, such as injection of a substrate to promote reductive dechlorination, were screened out based on the substantial heterogeneity of aquifer, particularly the presence of clay stringers within the sands.

The Martin Aaron Site conditions make adequate distribution of organic substrates difficult. Also, the compounds requiring treatment include both aerobically (e.g. benzene) and anaerobically degradable organics (e.g. TCE), thus increasing complexity.

Risk to current and future adult and child residents from inhalation of fugitive emissions from surface soil and subsurface soil (vapor intrusion), was conducted as part of the Human Health Risk Assessment (HHRA) dated February 2005. Also based upon the RI, groundwater VOC concentrations decrease to levels that do not cause vapor intrusion risks to residents near the Site. However, the Selected Remedy identifies vapor intrusion into new or existing structures on site as a potential exposure pathway for VOCs in groundwater. The HHRA was included as part of the Administrative Record for the Site.

COMMENTS RECEIVED FROM THE PRP GROUP:

Comment G-1: *The Proposed Remedial Action Plan (PRAP) does not clearly, consistently, or correctly define the limits of the Martin Aaron Superfund Site.*

EPA should clarify its definition of the Superfund Site boundary. All of the figures in Section 2 of the FS show the Martin Aaron Superfund Site as being within an approximate rectangular area bounded by Jackson Street, Sixth Street, property north of Everett Street, and the western half of Broadway Street. If EPA defines the Superfund site to include areas that were impacted by the Martin Aaron drum recycling operations, then the limits of the Site should not include the surrounding properties - the scrapyard to the north or the Comarco property, Ponte property and row homes to the south. There is no evidence that Martin Aaron drum recycling operations may have impacted these locations. To the contrary, the historical use and development of the Martin Aaron property and surrounding areas clearly reflects that industries such as tanneries, shoe leather manufacturers, slaughterhouses, white lead works and glass factories likely have impacted soils at those locations. Specifically, the current Comarco property was occupied by a number of slaughterhouses and meat processing companies (abattoirs), which (like the tannery) would have used arsenic for rodent control. Historical Sanborn maps also show that these companies used coal-fired furnaces and ovens that would have resulted in PAH impacts. The Kimble Glass factory occupied the current scrapyard property to the north of the Martin Aaron property. Arsenic, lead and barium are commonly used in the glass manufacturing process and it is reasonable to conclude (especially given the contaminant distribution patterns)

that the glass making process would have impacted this area. Further, scrapyards tend to adversely impact the environment and the agency should consider that possibility in its definition of the Site.

The PRAP interchangeably uses the expressions "Martin Aaron Superfund Site", "Martin Aaron site", "Martin Aaron property", and "Martin Aaron parcel". The lack of a consistent definition is confusing to the reader and leads to an incorrect impression of the extent of the Superfund Site and potential sources of contamination relating thereto.

USEPA should rewrite the PRAP to use a single and correct term when referring to the Site so that the public can have a clear understanding of the extent of contamination and scope of the Superfund remedy. USEPA should then extend the public comment period to allow the public ample time to review the corrected PRAP.

EPA response: The RI evaluated the nature and extent of contamination found at the site, without regard to the source of that contamination. Because of a long history of industrial land use in the area, the RI attempted to identify releases that are attributable to the NPL site, but also to identify other potential sources of contamination from neighboring properties (for example, the former lead smelter across Sixth Street). These investigations included the Martin Aaron property, the South Jersey Port Corporation (SJPC) property, the scrap-yard (north of the Martin Aaron property), Comarco Products (a food processing facility to the south), the Ponte Equities property (unoccupied warehouse buildings, also to the south), and various properties and right-of-ways on Everett, Sixth, and Jackson Streets. The Proposed Plan further explains that the SJPC property will be addressed through a state action.

EPA has provided a detailed description of the site, and has explained its position regarding the impact of Martin Aaron operations on surrounding properties in the RI/FS and the Proposed Plan. EPA received extensive comments from the community at the public meeting, requesting clarifications about various aspects of EPA's Proposed Plan (please see EPA's written synopsis, above.) None of the comments requested clarification of what was meant using "Martin Aaron Superfund Site", "Martin Aaron site", "Martin Aaron property", or "Martin Aaron parcel".

Comment G-2: *USEPA has not properly evaluated all of the reasonable combinations of soil and groundwater technologies and*

therefore the development and evaluation of alternatives for the Site is incomplete and incorrect.

For example, only Alternative S-3 evaluates in-situ technologies and does so jointly for arsenic and VOC remediation of soil (solidification and SVE, respectively). In evaluating Alternative S-3, USEPA concludes that there is a relatively high degree of technical uncertainty; it fails, however, to clarify that this uncertainty is predominantly associated with the SVE technology and not with the soil solidification component of the alternative. As a result, the in-situ technology for arsenic in soil was inappropriately eliminated.

Soil stabilization to remediate metals contamination is a proven technology that has been selected by EPA at other Superfund sites. Exhibit B, prepared by Parsons, discusses in-situ soil options that have been applied successfully at other sites and should be further evaluated for this Site.

USEPA should evaluate a treatment train that combines solidification/stabilization for arsenic source area soils with excavation or other options for VOC source areas before selecting a remedy for the Site. Such a combination of alternatives is feasible and appropriate and should be considered, since the arsenic and VOC source areas do not overlap significantly.

EPA response: During the development of the proposed remedy for the site, EPA evaluated available site data in consultation with NJDEP, met with members from the local community, and considered a wide range of feasible technologies. The remedial alternatives that resulted from this process are presented in the FS Report. EPA believes that the remedial alternative selected best satisfies the remedy selection criteria. There are numerous possible combinations of soil and groundwater remedial technologies that can be assembled into remedial alternatives. The goal of the FS is to provide an appropriate range of alternatives that are capable of addressing the remedial action objectives at the site.

As discussed in the FS, Proposed Plan and Decision Summary, the technical implementability concerns with Alternative S-3 are associated with both arsenic solidification and SVE. The heterogenous nature of the subsurface soils introduces uncertainty in the effectiveness of SVE, because of the variability of air permeability of the fill materials and soil. Uncertainties in the implementability of arsenic solidification are also present because of the heterogenous nature of the fill and soil. For example, the Site contains large diameter

concrete, asphalt, wood, glass, bricks, and slag in the fill material which affects the ability to achieve an adequate mix and minimize arsenic leachability. Accordingly, EPA believes the site is not a good candidate for solidification given these uncertainties and does not believe the additional time needed to perform bench and pilot-testing is warranted.

One method of improving the likelihood of success for solidification would be to excavate and remove the oversize material and debris. The additional soil handling and disposal costs may substantially increase the overall cost of Alternative S3.

Comment G-3: *USEPA has selected Soil Alternative S4 (Excavation, Treatment and Off-site Disposal), in large part, on the assumption that this alternative has relatively less uncertainty than the other alternatives considered by USEPA. As required by relevant regulation and guidance, USEPA should substantiate and quantify the uncertainty it alleges to be associated with those other alternatives before selecting a remedy for the Site.*

The National Contingency Plan ("NCP") states: "bench or pilot-scale treatment studies shall be conducted when appropriate and practical to provide additional data for the detailed analysis and to support engineering design of remedial alternatives". (40 CFR §300.430(d)(1))
<u>A Guide to Preparing Superfund Proposed Plans, Records of Decision and Other Remedy Selection Decision Documents</u> (OSWER 9200.1-23; EPA 540-R-98-031; PB98¬963241, pp.1-5), provides the same directive: "the RI generally includes conducting treatability tests to evaluate the potential performance and cost of the treatment technologies being considered for addressing these risks".

Similarly, EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988) states that: "if remedial actions involving treatment has been identified for a site, then the need for treatability studies should be evaluated as early as possible in the RI/FS process to avoid delaying the issuance of the FS."

These documents confirm the agency's own expectation that treatability studies are to be an integral part of the remedy selection process.

Here, without explanation, EPA rejects certain otherwise viable alternatives on the unsupported and generalized claim that they present more uncertainty than the selected alternatives.

Specifically, with respect to stabilization of arsenic in soil, the PRAP states: "Even after treatability studies to determine the appropriate injection points, solidification agents, dosage rates and other performance parameters, the uncertainties regarding the implementability would still be high, especially given the heterogeneous nature of the fill material at the site." (PRAP page 18.)

Neither the PRAP nor the FS provide any support for this statement. No data or other information is provided by the agency to demonstrate that the heterogeneous nature of the fill or other site factors would prevent the successful implementation of a stabilization remedy. In the absence of any treatability studies, EPA has no basis to quantify the degree of uncertainty, if any, associated with the implementation of a stabilization remedy. USEPA's rejection of solidification as a viable alternative is arbitrary and without proper scientific basis (see Parsons Report, Exhibit B).

In addition, the uncertainties noted in the above quotation from the PRAP are overstated and inconsistent with the FS. The FS specifically states that: "[a]ll alternatives can be implemented at the site, and no technical or administrative implementability problems are expected for any of the alternatives" (FS p.5-11).

USEPA should amend the PRAP to accurately reflect the conclusion in the FS that there are no technical or administrative implementability problems expected for any of the alternatives. USEPA's rejection of Alternative G-4 (Fixation of Arsenic in Groundwater) in the FS is likewise unsupported. The acknowledgment in the FS that all alternatives can be implemented without technical or administrative implementability problems also indicates that the PRAP is incorrect with respect to Alternative G-4.

Even in the absence of this conflict, the PRAP states: "Alternative G-4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G-4, relative to all other groundwater alternatives." (PRAP p.18).

The establishment of a proper chemical dosage and mix for chemical fixation is not the type of uncertainty, in and of itself, that would justify elimination of this option (see Parsons Report, Exhibit B). The word "uncertainties" as applied by USEPA to G-4 is a misnomer since such studies establish performance or design parameters more so than determine whether

fixation will work at all. The purported uncertainty should not have caused USEPA to reject fixation (especially where this alternative is considerably less expensive than the proposed remedy) without conducting the appropriate treatability studies. Moreover, EPA' s failure to conduct treatability studies runs counter to EPA's stated policy to encourage the use of innovative technologies where, as here, such technology offers the potential for comparable or superior treatment and performance at lower cost compared to other technologies. Both the stabilization of arsenic in soil and fixation of arsenic in groundwater have the potential to provide comparable, if not superior, treatment performance at significantly lower costs compared to USEPA's Preferred Alternative. Both technologies have been successfully implemented at other sites (see Parsons Report, Exhibit B).

Moreover, where, as here, EPA has selected a source control alternative for soil involving off-site treatment, after removal, Section 300.70 (C) of the NCP requires that USEPA determine that this alternative is either 1) more cost effective than other remedial alternatives; 2) will create new waste management capacity; or 3) is necessary to protect human health and the environment. Neither the PRAP nor its supporting documents provide evidence that off-site treatment of the soil meets any of these criteria.

In addition, USEPA acknowledges that its Preferred Alternative for groundwater may have technical difficulties meeting the remedial objectives. Specifically, EPA identifies in the PRAP certain site factors that may limit the effectiveness of the Preferred Alternatives, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination. Thus, EPA itself has identified what may well be greater uncertainties associated with a pump and treat remedy than those uncertainties purported to be associated with in-situ chemical fixation. The potential that the remedial effectiveness of the pump and treat alternative may be greatly limited is especially critical here where the most significant expenditures are "up front" in constructing the extraction and treatment system.

For all of these reasons, USEPA has arbitrarily eliminated remedial alternatives for soil and groundwater based on the erroneous assumption that the selected remedy has a lower degree of uncertainty associated with its technical implementability. Accordingly, and as stated in the FS, pilot/treatability testing should be conducted to more appropriately assess other technologies prior to selecting a remedy for the Site.

EPA response: Treatability studies are valuable tools, and EPA considered the need for site studies early in the RI/FS. The comment gives the impression that the agency tests out all potential treatment technologies before remedy selection at nearly every NPL site, which of course is not the case, and that by not performing them here EPA is being inconsistent with agency protocol. EPA typically employs treatability studies and more comprehensive pilot studies when an innovative technology shows promise in addressing site problems but when the new technology has not been tested under similar site conditions. The technologies under discussion, solidification (part of S3) and geochemical fixation (G4), have been implemented at other sites, and EPA felt that the site, which is relatively small in size and not overly complex, did not pose the types of technical challenges that might warrant treatability studies.

EPA did not "reject" Alternatives S3 and G4. In fact, both solidification and geochemical fixation were retained after the technology screening process precisely because they were adequately well suited to addressing site problems. All of the alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria as required by the NCP. The evaluation presented in the FS and Proposed Plan provide the details of why Alternatives S4 and G5 were selected.

The comment states: "*....EPA has selected a source control alternative for soil involving off-site treatment, after removal, Section 300.70 (C) of the NCP requires that USEPA determine that this alternative is either 1) more cost effective than other remedial alternatives; 2) will create new waste management capacity; or 3) is necessary to protect human health and the environment. Neither the PRAP nor its supporting documents provide evidence that off-site treatment of the soil meets any of these criteria.* " The text refers to the 1985 NCP that was superseded by the 1990 NCP. There is no Section 300.70 in the current NCP and the quoted section is no longer an NCP requirement. Section 300.430(f)(1)(ii)(E) of the current NCP (40 CFR § 300.430(f)(1)(ii)(E)) requires the balancing of alternatives to consider the preference of treatment as a principal element and the bias against off-site land disposal of untreated waste. Accordingly, the proposed remedy requires treatment of the excavated waste as needed to meet Land Disposal Requirements (LDRs), not as a remedial measure required for site protectiveness.

EPA proposed Alternative G5 following an evaluation of all NCP criteria, as discussed in the Proposed Plan and in greater detail in the Decision Summary. EPA did not reject Alternative G4 solely on concerns over implementability. Alternative G5 was

selected in part because it will address both the arsenic and VOC plumes, because it removes arsenic from the aquifer (instead of precipitating it into the aquifer soil matrix and leaving it on site) and because appears to have the best chance of eventually restoring the groundwater to the Cleanup Goals. As described in the Decision Summary, EPA will allow treatability studies that further evaluate chemical fixation to be performed during remedial design. The results of these studies may resolve some of the uncertainties regarding this Alternative.

Comment G-4: *USEPA's Preferred Alternative for groundwater (G5 - Groundwater Collection and Treatment):*

A. Is not appropriate or necessary to remediate VOCs in groundwater in a reasonable time frame once the VOCs in soil are addressed (as acknowledged by USEPA).
B. Has not been demonstrated to more effectively remediate arsenic in groundwater, compared to other alternatives.
C. Has significant uncertainty (as acknowledged by USEPA) relative to effectiveness and achieving the RAOs.
D. Is not based on a complete or accurate conceptual site model for the groundwater and geochemistry at the Site.
E. May exacerbate the extent of arsenic and other contaminants in groundwater.
F. Is not necessary given the current use and expected future use of groundwater in the area.
G. Has been estimated by USEPA to cost, at a minimum, $5 million dollars more than a potentially effective in-situ alternative.
H. Has not been agreed to by the CCMUA and may not meet CCMUA discharge limits as currently proposed by USEPA.
I. Has significant construction, operational and maintenance complexities that have not been fully or adequately addressed by USEPA.
J. May be inconsistent with permitting and other limitations that may be imposed by the Delaware River Basin Commission (DRBC).
K. Is inconsistent with the State of New Jersey Water Supply Administration's concerns for this area.
L. Is not considered to be in the best interest of the community and the potential for site redevelopment.

Supporting Information for Comment G-4

[Comment G-4]A. Alternative G5 is not appropriate or necessary to remediate VOCs in groundwater in a reasonable time frame once the VOCs in soil are addressed (as acknowledged by USEPA). With regard to the VOC contamination in groundwater, USEPA's RI Report, FS Report and PRAP all conclude that natural attenuation of VOCs is ongoing. The FS and the PRAP also acknowledge that

treating or removing the VOC source areas would substantially reduce the time needed for natural attenuation to achieve the remedial action goals. Specifically, on page 19 of the PRAP, USEPA states:
"With the removal of VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame."

USEPA, however, inappropriately eliminates Monitored Natural Attenuation ("MNA") for VOCs in groundwater because it assumes in the PRAP that arsenic will not naturally attenuate. That conclusion ignores the fact that VOCs and arsenic in groundwater are generally not co-located, and can be treated separately in a more efficient and cost effective manner than presently proposed.

As explained in Exhibit A by McLane Environmental, natural attenuation of the VOCs in groundwater is estimated to take approximately 20 years, not the 40-50 years USEPA indicates in the PRAP. A 20-year MNA time frame has been determined by USEPA at other sites to be reasonable, especially, as here, where the groundwater is not expected to be a drinking water source.

EPA response to Comment G-4A: EPA selected Alternative G5 as the recommended alternative after consideration of a variety of factors during the evaluation of the NCP criteria, as discussed in the Proposed Plan. One factor not mentioned in the comment is that arsenic, which is co-located with the VOC groundwater contamination, is poorly suited to an MNA remedy. While EPA does in fact share the position that some of the VOC plume is undergoing natural attenuation, EPA also believes that an active remedy such as containment or collection and treatment of contaminated groundwater provides a proactive remediation approach and is capable of restoring the aquifer in a reasonable time frame.

Estimates of environment restoration time frames are entirely subject to the data used in the calculations, and calculating a shorter 20-year time frame for natural attenuation of VOCs would not be difficult. The data used was not documented in sufficient detail (initial concentrations, contaminants, groundwater velocity etc.), to allow for more a thorough response.

<u>[Comment G-4]B. USEPA has not adequately demonstrated that Preferred Alternative G5 will more effectively remediate arsenic contamination in groundwater compared to other alternatives.</u>
USEPA has not demonstrated through pilot or bench scale testing its Preferred Alternative (extraction and treatment) will be the most effective remedy for arsenic. To the contrary, the FS

identifies other technologies as feasible, implementable and without technical limitation. As discussed by Parsons in Exhibit B, in-situ chemical fixation of arsenic in groundwater (Alternative G4) is a remedy that has been proven to be effective at other sites and accepted by USEPA. As mentioned above, USEPA dismisses this remedial technology because it believes there is a higher degree of uncertainty compared to pump and treat. Until treatability studies have been conducted to evaluate in-situ remedies such as chemical fixation, it is inappropriate and unreasonable for EPA to select any alternative to address arsenic in groundwater. This is especially so, since USEPA concedes that its Preferred Alternative for arsenic in groundwater may not achieve the RAOs (see below).

EPA response to Comment G-4B: In choosing Alternative G5, EPA considered a variety of issues and did not focus solely on remediation of arsenic-contaminated groundwater; VOC contamination is also a concern in the aquifer. Please refer to Comment G-3 regarding the use of treatability studies at Superfund sites. EPA plans to address soils first, thereby removing a source to groundwater, prior to undertaking the Selected Remedy for groundwater, and this approach would allow for the performance of the treatability studies described above.

[Comment G-4]C. USEPA has acknowledged that there is significant uncertainty relative to effectiveness of Preferred Alternative G5 at achieving the Remedial Action Objectives for groundwater. USEPA cautions in the PRAP on page 19 that: "…certain site factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination, may limit the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame."

This type of uncertainty with groundwater extraction underscores the need to fully evaluate other alternatives, such as in-situ chemical fixation, which would not require groundwater pumping and not pose the potential to dewatering the water-bearing zone.

Further, relative to the groundwater extraction and treatment system, USEPA concludes on page 4-10 of the FS that: "It has been assumed that the system would be operated for 10 years to remove the majority of the contaminant mass (assumed to be seven and one-half pore volumes) and that MCLs in groundwater (with the exception of the shallow Upper PRM groundwater) will be met within the 10-year time frame." (emphasis added).

This statement reflects that the short and long-term effectiveness of the pump and treat remedy, and the estimate of costs associated therewith, is not based on scientific calculations but rather on nothing more than a series of untested assumptions. Worse yet, the assumption that MCLs will be met in 10 years has one notable exception --the shallow upper PRM aquifer. That water-bearing zone contains the highest level of arsenic in groundwater. EPA makes no effort to quantify how long it will take to remediate the upper PRM Aquifer. As such, the time needed to operate the pump and treat system to achieve MCLs is unknown and EPA cannot estimate the costs associated with that remedy with an accurate basis.

More importantly, USEPA's admission in the FS that a pump and treat remedy will not achieve MCLs in ten years with respect to arsenic contamination in the Upper PRM groundwater, undermines the very reason EPA selected pump and treat as the preferred remedy in the PRAP --"its ability to aggressively reduce arsenic contamination in a relatively short time frame (estimated at 10 years)." (See PRAP p.19). By its own admission, USEPA has concluded that a pump and treat remedy likely will not achieve that goal. In fact, a scientifically valid examination of the issue reveals that it will take hundreds of years (not 10 as USEPA assumes) to remediate arsenic in groundwater through a pump and treat approach (see McLane Environmental Report, Exhibit A.)

USEPA is well aware of the poor performance of groundwater extraction remedies to treat contaminants at other sites. On page 15 of Pump and Treat Ground-Water Remediation, A Guide for Decision Makers and Practitioners (EPA/625/R-95/005, July 1996) USEPA identifies "heterogeneous, multiple layer sites" as ones where the technical feasibility of complete cleanup of mobile, dissolved phase contaminants is "likely to be uncertain". At many sites with contaminants similar to those found at this Site, USEPA has abandoned the pump and treat systems in favor of other alternatives. Unfortunately at these sites, considerable costs were incurred to design, install and operate the pump and treatment systems before USEPA realized the approach would not work. This might have been avoided if other alternatives were more fully evaluated prior to the selection and implementation of a pump and treat remedy. The uncertainty USEPA assigns to the implementation of a pump and treat remedy at this Site raises serious concerns that a similar path will be followed here.

EPA response to Comment G-4C: EPA recognized that there is uncertainty in meeting the remedial action objectives, given site-specific factors, in the Proposed Plan and Decision Summary. But uncertainty factors affect all the active groundwater

alternatives, including Alternative G4 (Geochemical Fixation and MNA). For example, the silts and clay lenses in the shallow upper PRM introduce levels of uncertainty to Alternative G5 with the possibility of dewatering and of retardation through matrix diffusion, but these same silts and clays introduce uncertainty into geochemical fixation, complicating the introduction of the treatment reagents into the aquifer and the even distribution of those reagents within the aquifer matrix. These factors, as well as the question of the long-term permanence of fixation leads the agency to conclude that the uncertainties are greater for Alternative G4. Alternative G5 is also expected to rapidly remediate the VOCs that have greater migration potential and are of greater concern relative to long-term effectiveness and achieving the remedial objectives in a reasonable time frame. The comment implies that EPA eliminates alternatives in its remedy selection process, where in fact EPA's actual method is seeking the best balance of the balancing criteria for those alternatives that are protective and meet ARARs. As previously discussed, EPA chose Alternative G5 after consideration of a variety of issues and did not focus solely on arsenic remediation.

EPA estimated time frames for remediation in a manner similar to that presented in Attachment A of the comments. The number of pore volume exchanges was calculated based on achieving remedial goals for the maximum observed concentration of each contaminant exceeding remedial goals. The time to achieve the remedial goals was then calculated based on the estimated extraction system flow rate. TCE, with a retardation factor of 3.1, requires 7 pore volume flushes to decline from 11 ppb to 1 ppb. Benzene, with a retardation factor of 1.8, requires 6 pore volume flushes to decline from 110 ppb to 1 ppb. Alternative G5, with an estimated extraction rate of 40 gpm in the central portion of the plume, and contaminant plume dimensions of 50 feet thick and 5.4 acres in area, requires less than 10 years to meet the remedial objectives for these contaminants of concern.

[Comment G-4]D. Alternative G5 is not based on a complete or accurate conceptual site model for the groundwater and geochemistry at the Site. As detailed below in Comment G-6 and in Exhibit A, USEPA's conceptual site model (CSM) for the groundwater and geochemistry is not complete or accurate. For example, by combining wells from different strata and seemingly ignoring published characterization data for the PRM aquifer, USEPA has significantly underestimated the hydraulic conductivity of the PRM. As a result, USEPA has underestimated the number of wells and volume of water that will needed to establish a zone of capture that encompasses the arsenic and VOC plumes. This will have a considerable impact on the size and cost of the extraction

system and increase the probability that the extraction system will not achieve the RAOs.

USEPA's incomplete CSM also has resulted in a significant underestimation of the time that will be required to achieve the RAOs for groundwater. USEPA has incorrectly estimated the number of years to potentially flush the arsenic from the groundwater. As presented in Exhibit A, McLane Environmental, using USEPA's own equations and assumptions, has estimated that it will take over 100 years (not 10 years as assumed by USEPA) to flush arsenic contamination from the aquifer.

EPA response to Comment G-4D: EPA does not share in the opinion that Alternative G5 is based on an incomplete or inaccurate conceptual site model for the groundwater and geochemistry at the site. Refer to EPA's response to Comment G6 below. In addition, as noted earlier in the comments, EPA stated that remediation of arsenic is expected to take longer than the estimated 10 years because of the potential to dewater the shallow Upper PRM. EPA has highlighted, in response to other comments, some of the reservations it has with regard to geochemical fixation. The opportunity to perform treatability studies during remedial design may answer some of these concerns. In addition, remediation of arsenic in groundwater will be enhanced by removing the soil source areas. Once soil source areas are removed, groundwater will be resampled and reevaluated.

[Comment G-4]E. Alternative G5 may exacerbate the extent of arsenic and other contaminants in groundwater. USEPA acknowledges in the RI and PRAP that the highest concentrations of contaminants exist in the silty soils in the upper 10-20 feet of the subsurface. McLane Environmental has observed that the concentrations of contaminants below this clay are at least an order of magnitude lower than above (or in) the clay layer (see Exhibit A). While recognizing that the pump and treat remedy will likely dewater the uppermost groundwater, USEPA fails to recognize that this also may induce the flow of contamination downward, thereby increasing the level of contamination at depth.

Although USEPA acknowledges that there is contaminated groundwater migrating onto the Martin Aaron Site, it does not, however, also consider the potential that its pump and treat remedy may enhance the migration of these constituents onto the Site.

USEPA should respond to these concerns that the pump and treat remedy may exacerbate the vertical and lateral extent of contamination in the groundwater.

EPA response to Comment G-4E: This comment seems strongly at odds with the thrust of many of the other PRP comments regarding the fate and transport of the arsenic plume, which rely on the general immobility of the arsenic in groundwater as a point of departure. Be that as it may, the extraction wells would be screened in the shallow and middle portions of the Upper PRM to minimize the potential for drawing the more heavily contaminated groundwater in the shallow Upper PRM downward. Although some downward migration could be induced, these contaminants would be withdrawn and treated in the extraction system. The extraction system would be operated to withdraw contaminants from throughout the Upper PRM aquifer to satisfy the remedial goals, though many pump-and-treat systems with a goal of aquifer restoration reach a point where further aquifer restoration is impracticable. EPA would need to reconsider the pump-and-treat system at that time and may need to consider alternate concentration limits for the site.

Migration on site may be accelerated somewhat because the natural gradient would be increased by the extraction system. While industrial activities in Camden have probably created regionally poor groundwater conditions in some parts of the city, there is little evidence of a significant regional component to the groundwater contamination in the monitoring wells installed near the site. To the degree that there is a regional component to the contaminated groundwater, contaminants migrating on site would also be collected by the extraction system. This is not expected to be a significant issue because there is little evidence of upgradient contaminant sources.

[Comment G-4]F. Alternative G5 is not necessary given the current use and expected future use of groundwater in the area.
On page 19 of the PRAP, USEPA states: "While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations in a relatively short time frame."

USEPA has failed to demonstrate the need to "speed that process" since the RI and FS recognize that there is no current complete exposure pathway.

USEPA should recognize in its evaluation of remedial alternatives that the groundwater in this area contains naturally occurring metals that often require treatment before the water can be used as a drinking source. In addition, the area has a long history of widespread industrial activity not associated with the Martin Aaron drum recycling operations that has also impacted groundwater quality. Even after VOCs naturally attenuate and

remediation of arsenic takes place, the groundwater is not likely to be suitable for drinking water due to these naturally occurring metals. Therefore, USEPA's rationale for selecting pump and treat because of a need to speed up the remedial process is unfounded.

EPA response to Comment G-4F: Consistent with the NCP, EPA expects to return usable groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. The groundwater at the site is classified as IIA, which means it is a current or potential source of drinking water. EPA believes that Alternative G5 is the best alternative for meeting this goal at this site.

Please refer to EPA's response to Comment G-4E regarding regional groundwater conditions.

[Comment G-4]G. USEPA has estimated that Alternative G5 will cost, at a minimum, $5 million dollars more than a potentially effective in-situ alternative for arsenic in groundwater. Alternative G5 (Extraction, Pretreatment and CCMUA Discharge) is estimated by USEPA to cost $6,600,000, assuming that the RAOs are met in 10 years. USEPA estimates that each year beyond that 10-year assumption will cost a minimum of approximately $700,000. As noted above, USEPA recognizes that there is significant uncertainty that a groundwater extraction remedy will achieve the RAOs in 10 years. Comparatively, Alternative G-4 (Chemical Fixation and MNA) is estimated by USEPA to cost $1,700,000, with an estimated annual O&M of $26,000. USEPA has estimated it will take 40 years to completely remediate the area of impact in this water-bearing zone using Alternative G-4. This 40-year estimate is driven more by the arsenic presence than by the VOC presence. This estimate is misleading, since by its own admission on page 14 of the PRAP, USEPA states: "A pilot study to evaluate methods of distributing chemicals and the resulting effectiveness would be required prior to full scale injection."

Without this type of study, USEPA cannot, with reasonable accuracy, estimate time frames for remediation, or the type of in-situ remedy that could be implemented.

As discussed by Parsons in Exhibit B, USEPA appears to have considered only the use of a polymer-based injection, despite the fact that there are other sites being successfully treated for arsenic contamination using other chemicals. We suggest USEPA consider these other in situ chemicals in its alternative evaluation before selecting a remedy.

EPA response to Comment G-4G: EPA believes that the estimates of time to achieve remedial objectives are within an acceptable range of accuracy for the purpose of evaluating remedial alternatives. Under Alternative G4, it is assumed that the geochemical fixation is successful and arsenic is remediated once the in-situ treatment is completed. The estimate of 40 years to achieve remedial objectives is for the untreated VOC plume to naturally attenuate. EPA considered polymer-based injection as a representative process option for in-situ treatment of arsenic. Other in-situ chemical methods would normally be considered in remedial design if this alternative had been selected. Please refer to the Decision Summary regarding EPA's willingness to allow treatability studies further evaluating geochemical fixation.

[Comment G-4]H. Alternative G5 has not been agreed to by the CCMUA and may not meet the discharge limits. USEPA has assumed that the CCMUA is willing to accept the treated water from the groundwater treatment system. Furthermore, USEPA has assumed in its cost estimating and conceptual design that the groundwater will only need to be treated for arsenic prior to discharge to the CCMUA. In the FS, USEPA concludes that the levels of VOCs in the groundwater will not require pretreatment prior to discharge, however on Table 4-3 of the FS, no VOC discharge limits for the CCMUA are provided.

Further discussions with the CCMUA, along with appropriate groundwater treatability testing, are warranted before Alternative G5 is selected.

EPA response to Comment G-4H: EPA communicated with CCMUA during the preparation of the FS and the Proposed Plan. Contrary to this comment, CCMUA has indicated that the site-related groundwater can be accepted as long as it is pre-treated on site to meet appropriate standards. The proposed remedy for groundwater (G5) conservatively estimates a need for chemical precipitation to remove arsenic below CCMUA POTW limits prior to discharge. As presented on Table 4-3 in the FS, the VOC discharge limit is 5,000 ppb total toxic organics (TTO). The estimated influent TTO is below the discharge limit. It is also possible that arsenic will be below discharge limits as well, allowing for direct discharge without onsite treatment.

[Comment G-4]I. USEPA has not fully evaluated the construction, operational and maintenance complexities of the groundwater extraction and treatment system associated with Alternative G5. USEPA has underestimated the size, operation and maintenance

requirements for a groundwater treatment system capable of handling up to 100 gpm or more. The tables in the appendices to the FS note that the treatment building will likely contain a gravity settling system, sand filter, filter press, at least 4 process and storage tanks, several chemical storage tanks, equalization tanks, transfer pumps, mixing pumps and controls. There will also need to be storage space for chemicals such as hydrogen peroxide. Figure 4-10 of the FS illustrates the Groundwater Treatment Facility to be approximately 30 feet by 50 feet (1500 square feet). Existing treatment buildings for similar applications tend to be 3000 to 5000 square feet in size.

The location of the treatment building is conceptualized by USEPA to be on the Ponte Equities property (see FS Figure 4-10). There is no information that indicates this location will be acceptable to the owners of that property or that this location is suitable.

In addition to the treatment building, approximately ¼ to ¾ acres will be needed for parking, outside material storage, equipment storage, deliveries of consumable materials, pick up of potentially hazardous waste sludge from the chemical precipitation and treatment process, set-back requirements and security fencing.

The treatment building should be placed within a security fence not only for equipment protection, but to protect the community from the operating equipment, chemicals and waste sludge from the treatment process.

These factors have not been given adequate consideration during the alternatives evaluation and comparison process. Combined with technical limitations and impediments, they raise serious questions about the feasibility and cost of the selected pump and treat remedy.

EPA response to Comment G-4I: Figure 4-10 of the FS presents the location of the treatment system as conceptual in nature and is not intended to be scalable to the actual building size. The treatment system building cost of $156,000 included in the Alternative G5 cost estimate (see FS, Appendix B) is based on a size of 3,000 square feet. The location of the treatment works will be determined in the design. Details relative to the need for security fencing, parking lot size, etc., will be determined during design.

<u>[Comment G-4]J. USEPA has not included potential permitting and other limitations that might be imposed by the Delaware River Basin Commission (DRBC).</u> USEPA should clarify and discuss (if applicable) whether the DRBC may have jurisdiction over the

extraction of groundwater in this area. If such jurisdiction exists, then USEPA should consult with the DRBC and re-evaluate the effects of this jurisdiction on the groundwater remedy. The DRBC Water Code and Comprehensive Plan to Establish Water Usage Reporting Requirements (Final Rule) sets forth permitting, reporting and operational requirements for wells or systems that exceeds 100,000 gallons per day during any 30-day period. The groundwater extraction system proposed by USEPA will withdraw, at a minimum, 122,400 gallons per day (at USEPA's assumed extraction rate of 85 gpm). This suggests that DRBC permitting requirements may be applicable and should be addressed before a pump and treat remedy is selected by USEPA.

EPA response to Comment G-4J: DRBC requirements will be evaluated during design, though restoration of an aquifer is consistent with the overall water allocation and long-term management mission of the compact.

[Comment G-4]K. The use of a groundwater extraction remedy is inconsistent with the State of New Jersey Water Supply Administration's concerns for this area. The State of New Jersey has designated two areas of water supply concern. These are areas where the State believes excessive water usage poses significant threat to the long-term integrity of a water supply source. Critical Area No. 2 was declared in 1994 and includes Camden County. Water allocations from the Potomac-Raritan-Magothy aquifer system were reduced an average of 22 percent within this region by the NJDEP Water Supply Administration. The selection of a groundwater remedial alternative which is depletive, when other alternatives may be equally (or more) effective is not consistent with the State's objective of preserving the water supply source in this area.

EPA response to Comment G-4K: EPA recognizes water supply concerns. The extraction flow rate of 85 gpm for Alternative G5 will be necessary only until remedial goals are met, currently estimated to be within 10 years. In addition, the selected remedy was developed by EPA along with technical support and approval from the NJDEP. NJDEP is responsible for ensuring that the selected remedy is consistent with state's environmental laws, regulation, and policies. NJDEP has concurred with the Selected Remedy for the site.

[Comment G-4]L. Alternative G5 is not in the best interest of the community and the potential for site redevelopment. When compared to the potential application of an in-situ groundwater remedy for arsenic (coupled with MNA for VOCs), Alternative G5 is not in the

best interest of the community and will significantly restrict the site from redevelopment for the following reasons:

- *The treatment building will require a security fence, security alarms, and lighting. This will be an on-going facility for at least 10 years.*
- *The treatment building will require alarms which could sound at any time of the day or night, assuming the plant runs 24 hours per day, 7 days per week.*
- *The treatment process will generate noise, even if the building is constructed to minimize the noise.*
- *There will be deliveries of materials and equipment, as well as trucks to remove the waste sludge from the site.*
- *The pipelines connecting the wells to the treatment building will be placed in trenches. As shown in the FS these pipelines will go directly from the well(s) to the building. The FS does not account for future construction of any buildings that require foundations or underground utilities (such as water and sewer) which will be constrained by the presence of these pipelines.*
- *The pipelines to wells will require the excavation of many streets and sidewalks in the area. These pipelines must remain accessible for maintenance. In addition, the installation of these pipelines will need to incorporate the existing public utilities (water, sewer, electric) and may require that these services be temporarily disconnected.*
- *Extraction wells and pipelines will need to remain accessible for maintenance and/or replacement, thereby precluding development in these areas. Recovery wells within the streets and sidewalks poses additional health and safety concern for traffic and pedestrians, and individuals working in this area.*

Accordingly, USEPA should re-evaluate its selected remedy and give full consideration to the serious short and long-term impacts to the community.

EPA response to Comment G-4L: EPA did evaluate short and long-term impacts to the community and believe that the Selected Remedy's impact on site redevelopment is minimal, and substantially less than, say Alternative G4 (geochemical fixation) during the construction phase. For instance, the extraction well locations and piping can be placed at the site in a manner to minimize impacts on future development. Pipe runs can be combined and routed along the site perimeter. The treatment building, if needed, can also be placed along the site perimeter. Effects on the community during construction and operation of Alternative G5 are also minimal. The main components of the treatment process that generate noise are limited to pumps. There are no high noise blowers needed for chemical precipitation. Noise reduction can be achieved in the

building design. System operation alarms are designed to shut down critical components and alert on-call treatment system operators. There is no expected need for alarms alerting the neighborhood.

Please note that while there are residential row-houses on Jackson Street, the nearest residential area is on Sixth Street south of Jackson Street. The site is located directly across from a metals recycling facility at Sixth Street. Since a significant amount of truck traffic passes through this neighborhood, the surrounding noises are likely to be significantly greater than those produced on site during remedial site activities. Based on experience at other sites, EPA does not anticipate that noise issues will present concerns to the community during remedial activities.

Comment G-5: *As illustrated by the comments herein and in Exhibit A from McLane Environmental, USEPA has failed to develop a Conceptual Site Model (CSM) for this Site that meets any of the fundamental objectives outlined in its own guidance documents. As a result, the identification of appropriate remedial technologies is incomplete and scientifically unfounded and USEPA has prematurely and arbitrarily selected a remedy that is not scientifically supported by an accurate understanding of the Site.*

According to USEPA guidance, the CSM is used to identify and develop remedial action objectives (RAOs) for the site (OSWER Directive 9355.3-11). The RAOs generally describe what the remedial action is expected to accomplish. The Feasibility Study (FS) relies on the RAOs (which are based on the CSM) to identify and screen various remedial technologies for soil and groundwater. Therefore, the CSM is the cornerstone of the remedy evaluation and selection process.

According to USEPA's own guidance (OSWER Directive 9355.3-11, page 2-15), a primary objective of a Remedial Investigation (RI) is to: "Develop a Conceptual Site Model (CSM) that presents hypotheses regarding the suspected sources and types of contaminants present, contaminant release and transport mechanisms, rate of contaminant release and transport, affected media, known and potential routes of migration, and known and potential human and environmental receptors. Hypotheses presented in the model are tested, refined and modified throughout the RI."

The following provides examples of how USEPA's CSM for this Site is flawed and fails to achieve the required objective cited above.

EPA's CSM Fails to Adequately Evaluate and Explain Suspected Sources and Types of Contamination

There is extensive historical information that documents nearly 40 years of tannery operations at this Site - an industry that is well known for its use of arsenic. This information is detailed in the report Summary of Historical Ownership and Uses of the Martin Aaron Superfund Site and Select Nearby Properties, July 2005, which is in the Administrative Record. In addition, USEPA and other regulatory agencies have documented the use and presence in the environment of arsenic at many other former tannery sites.

USEPA's CSM does not provide a complete hypothesis that explains the source(s) of contaminants at the Site because it fails to adequately consider the environmental impacts from the historical operations at the Site. For example, the areas of higher concentration of arsenic in soil at this Site are coincident with the location of historic tannery operations - specifically, the beam houses where most of the tannery operations were conducted. This explains the source and distribution of arsenic in soil and groundwater at this Site, but is not discussed by USEPA. Accordingly, USEPA's CSM does not provide an accurate hypothesis regarding suspected sources of contamination at the Site.

Furthermore, USEPA fails to adequately consider the other historical sources of contamination in the area (that are unrelated to the Martin Aaron drum recycling operations) in its CSM. For example, the former Kimble Glass factory to the north and the former Camden White Lead Works to the east are likely sources for the barium, lead, arsenic and other contaminants detected in the soil and groundwater in the area. Yet these industries and their potential as sources of contaminants are barely discussed (if at all) by USEPA in the RI, FS or PRAP. USEPA's CSM also fails to adequately address and incorporate background soil and/or groundwater quality in its explanation of the source(s) of contamination at the Site. EPA's CSM does not consider upgradient sources that are contributing to the groundwater contamination at the Site, as evidenced by the presence of significant levels of contaminants (such as arsenic) in monitoring wells located upgradient of the Martin Aaron property.

USEPA's CSM also does not adequately explain the nature (type) of contaminants present in the soil or groundwater. For example, and as described in Exhibit A, USEPA did not conduct any tests to determine the species of arsenic in the soil or groundwater at the Site (i.e. arsenite or arsenate). As a result, USEPA's CSM is

unable to adequately explain how arsenic may have migrated in the soil and/or groundwater.

<u>USEPA's CSM fails to explain contaminant release and transport mechanisms, rate of contaminant release and transport, affected media or known and potential routes of migration.</u>

USEPA's CSM fails to put forth any reasonable explanations for the migration of contaminants in the area of the Site. For example USEPA's CSM (as described in the RI/FS and PRAP) states that contaminants such as arsenic and PAHs migrated through the unsaturated soil from the Martin Aaron property to the Comarco property and the row homes to the south. This is contrary to USEPA's RI which states relative to the migration potential of contaminants in the vadose zone (unsaturated soil): "…the transport of contaminants in the vadose zone is primarily downward, directly to the water table, with little to no lateral migration from the source areas." (Section 6.1.1)

USEPA's CSM fails to accurately explain the extent of affected media because its interpretation of the distribution of contaminants fails to include critical data. For example, USEPA has incorrectly mapped the arsenic concentrations present in groundwater (see Exhibit A). The extent of arsenic in groundwater, as shown in RI Figure 5-47, FS Figure 2-11, and PRAP Figure 3, among others, show the arsenic plume to be centered around wells MW-1S and MW-16S. Yet RI Table 5-11, FS Table 4-3, and other tables show the arsenic in well MW-13S to be several parts per million. Therefore, USEPA has incorrectly interpreted the extent of the impact to groundwater.

As explained in more detail in Exhibit A, USEPA's CSM does not adequately or accurately explain transport mechanisms or known and potential routes of contaminant migration in groundwater. USEPA has developed and relied on a conceptual groundwater flow model that inappropriately combines information from wells that are installed in two different water bearing zones. One set of wells is installed in a perched zone that exists on top of (or in) silty/clay materials. The other shallow wells are installed in the Shallow Upper PRM aquifer at this Site. The water levels in the perched zone wells are not representative of the PRM aquifer water levels. As a result, USEPA has determined horizontal and vertical gradients from these wells that are not representative of PRM hydraulic conditions (see Exhibit A). USEPA's CSM incorrectly assumes that there is a continuous, saturated zone through which the contaminants in groundwater migrate. It is more likely, as explained in Exhibit A, that several of the contaminated wells reflect pockets of perched

water that may not be hydraulically connected to the PRM. Similarly, the average hydraulic conductivity value of less than 1 foot per day (as estimated by USEPA in the RI, page 4-7) is not representative of the hydraulic conductivity of the PRM aquifer, but rather the perched water zone. Furthermore, hydraulic conductivity estimates of 4 to 6 ft/day for other portions of the PRM aquifer beneath the Site are at least a factor of 10 lower than values reported by other well-known studies of the PRM. This inconsistency with published values may also reflect improper well installation and development, or problems with the analysis of the slug test data. Without accurate and consistent hydraulic data, USEPA's CSM cannot fulfill its intended purpose - to explain the transport and migration of contaminants in groundwater.

As discussed in Exhibit A, the geochemical CMS is also flawed and incomplete. For example, McLane Environmental explains that sufficient data have not been collected to reliably determine the aquifer redox conditions, or to determine the form of dissolved arsenic (arsenate or arsenite) in ground water beneath the site. There also appear to McLane Environmental to be problematic trends and associations in the geochemical data that may indicate errors in sampling. The uncertainty in the geochemistry CSM has significant implications in explaining the fate and transport of both arsenic and VOCs.

As detailed in the other comments herein and in the attached reports, the implications of USEPA's flawed CSM for this Site are far-reaching and have seriously compromised the remedy selection process. As a result, USEPA should not select a remedy at this time, but should:

- *Revise the RI and CSM to appropriately consider historic and off-site sources of contamination;*
- *Conduct a thorough review of the existing data and its correct application and interpretation;*
- *Conduct the additional testing needed to address fundamental data gaps in the RI/CSM; and,*
- *Revise the RI and CSM to accurately reflect historic and current site conditions.*

Only after this work is completed will USEPA have a CSM that accurately explains all relevant data and serves as a sound basis for evaluating remedial alternatives.

EPA response: Regarding the potential source of arsenic contamination, as extensive sampling conducted during the RI and previous investigations indicated, arsenic is present at levels above screening criterion and the site Cleanup Goals in areas

throughout the site. As such, the areas with high levels of arsenic have been identified as "source areas". Via leaching to groundwater, arsenic concentrations in the soils may be a source of continuous release of arsenic into the groundwater. The Proposed Plan does acknowledge the former tannery operations as a potential source of the arsenic contamination, where, among others, on Page 4 it states: "arsenic may be attributable to the drum reconditioning operations, but it is also typically a remnant of tannery operations". In addition, EPA recognizes that arsenic may have been mobilized under reducing conditions.

EPA has also considered other historic potential sources in the area, unrelated to the drum recycling operations. As stated on Page 4 of the Proposed Plan, and many additional statements throughout the RI and Proposed Plan, when discussing metals found above screening levels, "Industrial operations on neighboring properties probably also played a factor: a glass-making company, a possible source of barium, operated on the scrapyard property; and a lead smelter operated across Sixth Street from the Site." The Proposed Plan also states, on Page 5, "that the highest concentrations of lead, the most frequently detected metal, were found across Sixth Street in the right-of-way, in front of the former smelting facility." The objective of the Proposed Plan in determining a proposed remedial alternative in the Superfund cleanup process is to protect human health and the environment from contamination in site soils and groundwater regardless of the original source of contaminants.

The suggestion that a significant system of perched zones occur across the Site is erroneous. Only MW-13S exhibits anomalous water level measurements suggestive of a perched water table. The lower five feet of screen in MW-13S lie in a sand unit. The occurrence of a local, blind sand unit under artesian pressure is more likely than a perched zone given the construction of MW-13S in comparison to the surrounding lithology. Differentiation of a perched zone because the well screens transect a clay unit is speculative, is not otherwise substantiated in the RI. Also please refer to EPA's response to Comment G-7, Bullet 4, below.

EPA does not believe that the geochemical conceptual site model is flawed and incomplete. Given the site's location in a recharge area, the relationship of oxic geochemical conditions in deeper portions of the aquifer in comparison to shallow areas is often observed in PRM System aquifers. Deeper groundwater flow often enters the aquifer from the outcrop areas. The appearance of the gasoline additive MTBE from an off-site source serves as a reliable tracer of regional flow patterns from fresh, oxic sources. With the greatest organic concentrations occurring in the shallow portion of the Upper PRM Aquifer at the Site, reduced

groundwater conditions along with elevated iron and manganese are expected. Highly reducing conditions can also mobilize arsenic in the soil matrix into solution.

EPA also does not agree with the statement that the "CSM also does not adequately explain the nature (type) of contaminants present in the soil or groundwater." Section 5 of the RI Report presents a detailed description of the nature and extent of contamination found at the site. The text, tables, and figures of the RI, FS, and Proposed Plan present the data collected throughout the RI in the appropriate manner, and appropriately discuss the mechanisms of fate and transport required to gain an understanding of the site conditions. Numerous spyder maps and cross sections have been developed to illustrate the distribution of contamination vertically and laterally at the site. Furthermore, the identified soil and groundwater remedial alternatives, upon implementation, are intended to remediate all areas of the site that require remediation based on the NCP criteria and the results of the human health and ecological risk assessments.

Comment G-6: *USEPA should bifurcate the remedy for the Site into separate Operable Units. USEPA has identified certain areas where VOCs and arsenic in soil are assumed to be ongoing sources of contamination to the groundwater. On this assumption, USEPA has concluded that these soil areas must be actively remediated.*

USEPA makes the following statements in its documents:

"These natural degradation processes may decrease VOC contaminant concentrations over time, especially if an active soil remedy is undertaken to address VOC source areas." (PRAP, pg. 13)

"Studies performed during the RI indicate that natural attenuation of VOCs is probably underway." (PRAP, pg. 13)

"Environmental monitoring will be used to assess the degree of natural attenuation and allow estimates of time necessary to reach remedial goals". (FS, pg. 4-10)

"The arsenic would be expected to precipitate onto the aquifer matrix over time as the shallow upper RPM (sic) aquifer slowly returns to aerobic oxidizing conditions. The time for this to occur is dependent on the rate of oxygen and the transfer to the shallow aquifer and the degree to which the oxygen will be utilized by microorganism present in the aquifer to degrade organic substrates. The time needed for this to occur can be

estimated based on natural attenuation data collected as part of this alternative." (FS, pg. 4-10)

Therefore, in its own documents, USEPA clearly puts forth an expectation that groundwater conditions will improve following soil source remediation, and that the time frame for natural attenuation can only be determined by subsequent monitoring.

Accordingly, there is adequate information and technical justification for USEPA to stage the remediation by first addressing contaminant source areas in soil and then monitoring the effects of that remedial action on the groundwater quality. Only until those effects have been quantified and evaluation can USEPA make an informed decision regarding the need for active groundwater remediation. USEPA should separate the soil and groundwater into two Operable Units for the purpose of remedy selection.

EPA response: EPA has indicated its intent to implement the soil remedy first, with the groundwater remedy to follow soon after. In the Decision Summary, EPA acknowledges the value of performing additional treatability studies to more thoroughly evaluate geochemical fixation as a site remedy. EPA also expects that a period of groundwater monitoring would follow the completion of the soil remedy, to allow for aquifer stabilization and to assure proper remedial design; however, the agency still expects that the remedial action will be necessary.

Comment G-7: *The Remedial Investigation (RI) Report is characterized by missing and incorrect data and information, incorrect data interpretation, unsupported assumptions, unexplained anomalies and inconsistent statements. In its current form, it should not be used as a basis for alternative evaluation and should be corrected and revised before USEPA makes a determination of an appropriate soil or groundwater remedy for this Site.*

Bullet 1: An example of missing data and information is found in the Summary of Remedial Activities section of the RI Report. This section refers to NJDEP and USEPA remedial actions, yet no details are provided explaining the remedial actions performed. Specifically, USEPA does not discuss what remedial work was conducted, where the work was conducted, and where soil either was either moved or removed. This information is essential in accurately characterizing the Site.

Bullet 2: An example of the incorrect data contained in the RI is found in Table 5-11 (page 6 and 7 of 29), which lists arsenic

concentrations found at MW-13S, a critical well location. The June 2002 result for total arsenic was 6400 ug/L. The September 2002 result for total arsenic is shown as blank, indicating that the result is below detection criteria. However, this is incorrect. The total arsenic result reported for September in Table G.11 of the RI Report (Page 7 of 31 of the Appendix) was 5890 ug/L. However, this result was rejected for unexplained reasons. Furthermore, each figure used by USEPA in the RI and FS to illustrate the extent of arsenic in groundwater uses the September 2002 results and therefore carries forward this erroneous interpretation of groundwater contamination. As a result, USEPA repeatedly and incorrectly indicates that arsenic in groundwater is below criteria at location MW-13S. This has a significant and compounding impact on the evaluation of alternatives in the FS.

Bullet 3: An example of the unsupported assumptions contained in the RI can be found in Chapter 9, where there are several references to sources of contaminants at the Martin Aaron property including"…buried drums of hazardous waste (excavated from depths below the groundwater table)…". However, there is no supporting information showing that drums containing hazardous wastes were ever excavated from below the water table. In fact, Section 2.4.2.5 of the RI indicates that despite extensive investigation, only several drums were found at the Site. No information is provided regarding the location or depths of the drums, nor what they contained. Yet USEPA relies upon this assumption in an attempt to explain the presence and distribution of contaminants at the Site.

Bullet 4: An example of the unexplained anomalies and inconsistencies contained in the RI can be found in the USEPA's failure to explain the hydrogeologic conditions observed at well MW-13S. The location of this well is important in the interpretation of site conditions because it is at the downgradient edge of the Martin Aaron property, adjacent to a former tannery beam house and the Rhodes building. Table 4-1 and Figure 4-7 shows a water level of -0.45 feet at MW-13S. This water level is approximately 6 feet higher than expected given the potentiometric surface map. The RI Report provides no discussion or explanation for this water level or its implications. McLane Environmental discusses this point in detail in Exhibit A and concludes that this well is likely installed in a perched water zone.

These examples call into question the accuracy, completeness and validity of the data presented in the RI, and all subsequent evaluations, conclusions and recommendations derived from the RI,

as presented in the RA, FS and PRAP. No decisions regarding remediation at the Site should be made unless and until the RI undergoes a thorough and comprehensive review including:

- *A thorough QA/QC review;*
- *A cross-check of all data points, figures and tables;*
- *A thorough examination of the validity of all assumptions and statements of facts; and, the identification and closure of important data gaps.*

EPA response to Comment G-7, Bullet 1: Limited analytical data is available from the emergency response actions conducted between 1986 and 2000 at the site. The soil data that was collected was taken from the most contaminated areas of the site (areas with process equipment, sewer basins, etc.) and cannot be expected to provide valuable insight into current site conditions. The details that are available about the NJDEP removal actions are summarized in the NJDEP RI, which is included in the Administrative Record.

Based on an assessment of available historic data conducted prior to the EPA RI, EPA determined that data from the removal actions was not necessary to characterize current site conditions, or develop a remedy for the site.

EPA response to Comment G-7, Bullet 2: This comment is correct, though incomplete. No arsenic result is shown for September 2002 on Table 5-11 for MW13S, which incorrectly implies that no arsenic was detected in the total and dissolved samples. Appendix G shows that this sample result was rejected. The data validation report for this sample shows that these samples were rejected because the concentration of arsenic in the dissolved sample (5,890 ppb) was greater than the concentration of arsenic in the total sample (3,550 ppb). Therefore, both sample results were rejected.

Contrary to this comment, Figure 5-47 (September 2002) does not show a result for arsenic at MW-13S. It is appropriate that this figure does not show the rejected September 2002 sample results. Review of the field documentation for these samples shows that there was some crusty material encountered in this well during the June 2002 sampling event (further described in response to bullet 4 below). Due to the field verification of black sediment at this well location in June, and an anomalous result in the September sampling, an additional sample will need to be collected at this well location during the design of the remedy. However, EPA believes that this one anomalous result does not affect the RI/FS findings or invalidate the results of the RI, as discussed in more detail in the response to Bullet 4 below.

EPA response to Comment G-7, Bullet 3: This is an inaccurate assessment of the intent of the RI. EPA referred to the presence of buried drums as part of the documentation of the history of the site. However, EPA describes numerous sources of contamination throughout the site, including, but not limited to, the following:

- "between 1981 and 1993, inspections conducted by EPA and the New Jersey Department of Environmental Protection (NJDEP) at Martin Aaron identified unpermitted discharges of hazardous waste from leaking drums and roll-off containers. Anonymous reports indicated that drums of containerized waste were buried at Martin Aaron. Sampling events conducted by NJDEP between 1986 and 1993 identified organic and inorganic constituents in sewer basins and drums at the property (ES.1, 3rd paragraph);

- "Remedial actions have been taken to eliminate sources of contamination at Martin Aaron including the removal of buried drums, USTs, ASTs, and sewer basins. However, due to the presence of these sources, and the resulting contamination of the soil, constituents leach from the soil and are transported downward to the water table by infiltrating precipitation. The many intermittent clay lenses help to spread contaminant migration laterally (ES.5, 5th paragraph)."

- "Beginning in 1972, NJDEP and EPA issued numerous Notices of Violation (NOVs), Administrative Orders and Penalty Assessments, Complaints, Hearing Notices and Directives against Martin Aaron Inc. and Drum Services of Camden Inc. The identified violations included unpermitted discharges of hazardous waste, non-notification of spills and releases, improper storage of waste drums, improper waste handling and disposal, improper labeling of hazardous waste containers, hazardous waste storage violations, and others (Section 2.3.1, RI Report)."

In addition, Section 2.4.2.5 lists several areas of contamination including buried waste, roll-off containers, sewer basins/floor drains, storage tanks, and building operations. Figure 2-1 shows the locations of each of these areas. Section 9.2 of the RI also describes several source areas of contamination.

EPA does not rely on an assumption of buried drums to explain the distribution of contamination. The RI is comprehensive in describing the various sources which contribute to the contamination of soil and groundwater at the site.

EPA response to Comment G-7, Bullet 4: MW-13S is a 2-inch diameter, Schedule 40 PVC monitoring well installed from six to 16 feet below grade. The shallow subsurface at the Martin Aaron site consists of five to 10 feet of fill material underlain by interbedded, natural sands and silty clays of the Magothy Formation. The screen interval of MW-13S penetrates a clay bed from 10 to 12 feet below grade, but terminates in a well-sorted, fine sand unit. Thus, the screen of the monitoring well should be connected with the surrounding Upper PRM Aquifer.

The entire section logged in the well boring was stained black and emitted a strong petroleum odor. A sampling team encountered a crusty black material formed across the water table that prevented trolling a bailer into the well. The material was broken by spudding the bailer on the crust until it collapsed.

Although the water level in MW-13S was six feet higher than the mapped potentiometric surface, the water table was still transected by the well screen. With the well screen terminating in sand, the elevated water level in MW-13S suggests partial clogging of the well screen by the petroleum material encountered in sediments to 16 feet below grade, rather than a function of a perched water table. No free product was encountered in MW-13S during sampling.

The PRP's Exhibit A presents the opinion that water levels in eight of the 14 shallow monitoring wells (MW-12S, MW-13S, MW-14S, MW-15S, MW-16S, MW-17S, MW-18S, and MW-19S) represent a perched water table surface because well screens span across clay units. However, it should be noted that water level elevations in the selected wells behave in a similar manner to the other wells that are screened in primarily sand units (MW-11S, MW-4S, and MW-22S) with the same temporal fluctuations, and predictable elevations. In addition, the bottom of the screen in MW-13S lies below the mapped water table in the area and in a six-foot thick sand unit. Thus, the water level in MW-13S should not represent a perched zone.

While the data from MW-13S was discarded from consideration for mapping the potentiometric surface, given the number of other wells screened across the water table, its removal does not invalidate the findings of the RI report. With the exception of MW-13S, relatively reasonable potentiometric surface maps can be developed from the water level elevation measurements collected in monitoring wells screened across the water table. Figures 4-7 and 4-8 of the RI Report, depict relatively fairly flat, water table surfaces that follow the local topography and exhibit similar hydraulic gradients between two measurement periods. Changes in gradients across the Site may be related to the

percentages of clay within the well screens, but do not suggest several different water table zones (perched, regular).

In addition, 135 soil samples and 368 groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs and inorganic parameters during the RI, including QA/QC samples, under EPA's Contract Laboratory Program (CLP). QA/QC samples included field duplicates, matrix spike (MS)/matrix spike duplicates (MSD), equipment blanks, and trip blanks. The data were reviewed by EPA to assess accuracy, precision, and completeness using the criteria established in the National Functional Guidelines for Data Review. All of the data validation reports were within the applicable National Functional Guidelines for Data Review. Data qualifiers were added by the EPA when the QA/QC indicated bias. Completeness of analytical data was assessed for compliance with the amount of data required for decision making. The completeness goal for the project data is 95 percent. The percent completeness achieved for the soil data was 98 percent, and 96 percent for the groundwater data.

The validity of the RI can be substantiated by documented QA/QC procedures.

Comment G-8: *USEPA's conclusion in the PRAP that its Preferred Alternative for the Site "provides the best balance of tradeoffs among the alternatives" is inconsistent with USEPA's underlying evaluation of the NCP criteria. USEPA's Preferred Alternative should be ranked lower than some of the other remedial alternatives rejected by USEPA, especially since USEPA concede that there is significant uncertainty that the pump and treat remedy will be effective, if it works at all.*

The National Contingency Plan (NCP) requires that USEPA select a remedy that is cost-effective, permanent and provides the best balances of the following nine criteria:

1. *Overall Protection of Human Health and the Environment*
2. *Compliance with ARARs*
3. *Long-term Effectiveness and Permanence*
4. *Reduction of Toxicity, Mobility or Volume*
5. *Short-term Effectiveness*
6. *Implementability*
7. *Cost*
8. *State Acceptance*
9. *Community Acceptance*

Criteria 1 and 2 are considered by USEPA to be "Threshold Criteria" and statutorily must be satisfied in order for an alternative to be eligible for selection. If an alternative does

not meet these alternatives, it cannot be carried forward in the evaluation process. As detailed in Exhibit E, USEPA concludes, with the exception of the No Action alternative, that all alternatives for soil and groundwater meet these two Threshold Criteria. With the exception of the "No Action" alternatives for soil and groundwater, all other alternatives are carried forward.

Criteria 3 through 7 are considered "Balancing Criteria". USEPA must identify which of these criteria vary significantly and focus its evaluation on these factors. As detailed in Exhibit E, USEPA does not demonstrate that its Preferred Alternative provides the best balance of these criteria. In fact, USEPA concludes that some of the other alternatives provide a greater degree of short and long-term permanence and effectiveness. Moreover, USEPA concedes that its Preferred Alternative for groundwater may not work at all due to concerns regarding dewatering and subsurface soil conditions. USEPA concludes that other alternatives have the potential for a greater reduction in the toxicity, mobility or volume of contaminants. For example, USEPA concludes that Alternative G4 (Geochemical Fixation for arsenic in groundwater) will have greater short-term effectiveness than its Preferred Alternative G5 (pump and treat). USEPA also concludes that none of the alternatives have technical or administrative implementability problems. Therefore the implementability criteria cannot be used to eliminate the alternatives.

Criteria 8 and 9 are considered "Modifying Criteria" and are to be formally assessed by USEPA after the public comment period. The State has not formally commented and the public comment period has not ended.

As explained in Exhibit E, USEPA has relied on a series of unsupported assumptions to conclude that its Preferred Alternative will provide the best balance of these six criteria. The evaluation of the alternatives is inconsistent and based on conclusions that cannot be supported by the site information or other documents. When those inconsistent statements are examined in detail and the site information correctly interpreted, USEPA's Preferred Alternative ranks lower than other alternatives for this Site.

EPA response: As discussed in the Proposed Plan and in the Decision Summary, in some cases EPA's Selected Remedy is not ranked highest among all the alternatives considered for a particular criterion. The comment cites, as an example, that Alternative G4 (Geochemical Fixation) will have greater short-term effectiveness than the Preferred Alternative G5 (pump and

treat). This is not a particularly good example, because it is not actually the case: Alternative G4 as described in the FS is likely to be the most disruptive of the groundwater alternatives during the construction phase - that is, in the short-term (issue is also considered under the Implementability criterion). The comment chose to focus on the fact that this criterion also considers the time it takes each alternative to reach the Cleanup Goals, and in that limited sense Alternative G4 is expected reach the arsenic Cleanup Goal in the aquifer faster than other remedies.

EPA concluded that none of the alternatives have technical or administrative implementability problems that would eliminate them from consideration. Indeed, the Proposed Plan concludes that, with the exception of Alternative S2 (which requires a complimentary groundwater remedy to satisfy the remedial action objectives for soil), the FS alternatives are all viable remedies for the site.

Comment S-1: *Page 1, 2nd Paragraph "The excavated soil would be treated, if necessary, prior to land disposal."(Emphasis added). USEPA should explain why no testing was done (or reported in the RI/FS) during the removal and remedial actions to establish whether treatment of the soil prior to disposal would be necessary. If appropriate testing had been completed during these prior efforts there would be less uncertainty regarding the limits of contamination and the scope and cost of remediation. On page 4-6 of the FS, USEPA states "…it has been assumed that the arsenic in soil is leachable and will be characteristically hazardous for 50% of the excavated arsenic soil." Similarly, on page 4-7 of the FS, USEPA states "Discrete confirmatory sampling will be conducted to determine actual volumes of soil as well as potential hazardous waste characteristics." If testing has been done, we request that this data and the interpretation of the data be provided for review.*

EPA response: Waste characterization sampling of the type described in the comment has been performed at the site on a number of occasions. As described in the NJDEP and EPA RI Reports, emergency actions have involved the removal of drums, process equipment, underground storage tanks, and contaminated soil from process areas. As summarized in the EPA RI Report, from 1986 through 1993, NJDEP collected liquid and sludge samples from drainage systems and drum wash areas following removal actions. NJDEP also collected samples from buried drums exposed in test pits, sludge from sewer basins, soils, and effluent samples. The results identified the presence of hazardous waste in drums and elevated levels of metals in soil above appropriate NJDEP criteria, and was used for purposes of waste

characterization prior to off-site disposal, with treatment as needed.

The RI suggests that the results from these response actions are not representative of soils remaining at the site, and are not appropriate to use in the development of scope or cost estimates for soil currently present at the site. EPA based the estimates on scope and cost for the soil alternatives in the FS on the current RI, which is representative of current conditions. This was the appropriate approach to use in the development of soil alternatives in the FS.

Comment S-2: *Page 2, 1st Paragraph "Until at least 1940, various hide tanning, glazing and related operations were performed on this and neighboring lots." USEPA should expand the discussion of the historic operations that took place on the Martin Aaron property and surrounding lots. USEPA also should include in the site history and conceptual model a discussion on the extensive use of arsenic in the tanning and slaughterhouse processes. Arsenic solutions were commonly used to soak the hides to remove the hair prior to tanning the hides. Historical documents indicate that solutions containing as much as one pound of dry arsenic per pound of water were used in the tanning process, and that the hides would soak in "vats" and or "barrels" until the solution became too weak to be effective. Arsenic solutions were also used to prevent the tanned hides from being destroyed by bugs and worms (See Exhibit C). As early as 1891, the property currently occupied by Comarco was owned and occupied by various abattoirs/provisional dealers (e.g. Mills Brothers) and leather shoe companies (e.g. Isaac Ferris Shoe Manufacturing). These facilities are shown on historic maps as having open cattle pens, slaughterhouses and coal-fired ovens. It also should be noted that until at least 1906, the former tanneries owned some of the property that is now occupied by the residential row homes along Jackson Street.*

During the public meeting on July 26, 2005, USEPA stated that the presence of arsenic in the soil at the Martin Aaron Superfund site was likely associated with the use of arsenic for rodent control by the former tanneries. It is reasonable therefore to conclude that slaughterhouses, like tanneries, also used arsenic for rodent control, thereby contributing to the presence of arsenic in the soil in these areas. Furthermore, USEPA has attributed the PAHs detected at the Martin Aaron Superfund site to historic fill and/or coal from former tannery operations. The Sanborn maps document that the leather manufacturers and provisional dealers also used coal-fired ovens for heat and

commercial purposes and therefore also would have contributed to the conditions in soil and groundwater at these locations.

USEPA should expand the discussion of how the history of the properties currently occupied by Martin Aaron, Comarco, the scrapyard and the residential homes may have contributed to soil and groundwater conditions independent of the Martin Aaron drum reconditioning operations. This should include the examination of historic aerial photos, historical maps (e.g. Sanborn maps) and other documentation. The historical record is extremely important where, as here, the Site has been impacted by multiple sources from various time periods. To understand the fate and transport mechanisms, the historical information must be factored in during the evaluation of the data, the development of the site CSM, the determination of RAOs and the identification and evaluation of remedial alternatives.

EPA response: EPA believes that the descriptions of other operations (not including the drum recycling operations) at and surrounding the site presented in the RI, FS, and Proposed Plan are adequate. Additional information on these potential sources can be found in the Administrative Record. As stated previously, the objective of the Proposed Plan in the Superfund cleanup process is to select a remedial alternative that will protect human health and the environment from contamination in site soils and groundwater regardless of the original source of contaminants. As explained in the Proposed Plan, aside from fully understanding the role of the one-story Ponte Equities Building in possible site operations from the tannery era, the nature and extent of site contamination appears to be well understood. Further studies of the one-story Ponte Equities building will be conducted as part of the Remedial Design to ensure site-related contamination has not affected this area.

Comment S-3: *Page 4, 2nd Paragraph "PAHs were generally higher on the Martin Aaron property than on other properties, with the highest concentrations in the former process and drum storage areas of the Martin Aaron operation. The earlier tannery operations would have used coal for heating and drying hides, and these same areas of the Martin Aaron property also coincide with former coal storage areas from this earlier operation."*

USEPA has not demonstrated that a nexus (cause and effect relationship) exists between elevated PAH contamination in soil and the location of Martin Aaron drum reconditioning processes. Such a nexus, even if present, would not result from the Martin Aaron operations, but (as USEPA has correctly acknowledged elsewhere in the PRAP) from the operations that housed the

furnaces and stoves for the tannery operations that were co-located with the Martin Aaron buildings. PAHs detected during the RI (such as benzo (a) pyrene and benzo (a) anthracene) are known to be products of coal and other fuel combustion. "Their presence in the environment at higher concentrations is an artifact of habitation and is due to the widespread practice of emptying fireplaces, stoves, boilers, etc., in rural and urban areas over the past several hundred years."

(From Massachusetts Contingency Plan - Background Levels of PAHs and Metals in Soil, 5/02, Exhibit D).

Both the PRAP and RI document the presence of ash and cinders in the fill material in the area. USEPA should note in the FS and PRAP that in the early 1900s many industries used coal as a fuel source in their ovens, furnaces and boilers (as documented in the historic Sanborn maps). It is reasonable to conclude that the ash, cinders and resulting higher PAH levels in the soil are a direct result of the tannery operations that were present on the Martin Aaron property from approximately 1880 to 1940. Accordingly, we suggest USEPA include a statement in the RI, FS and PRAP that these historic operations would have had a direct impact on soils in areas beyond the Martin Aaron property.

The historical sources should be evaluated and the findings of such an analysis should be factored into the CSM. Only then should the USEPA proceed with its evaluation of alternatives.

EPA response: EPA acknowledges that additional sources outside the drum recycling operations may have contributed to contamination at the site, and EPA has included statements indicating this throughout the RI, FS, and Proposed Plan. In some cases the source the release of a class of contaminants can help EPA in its remedial planning (e.g., by helping to direct sampling or analysis methods). In the case of PAHs or, from Comment S-2, arsenic, the information about the potential source of the release had little influence in EPA's remedial planning. This is at least in part because PAHs and arsenic are common in urban settings, and might have originated from one of a number of sources. As is stated above, EPA's objective for the Proposed Plan is to evaluate a range of remedial alternatives that will protect human health and the environment from contamination in site soils and groundwater, regardless of the original source of contaminants.

Comment S-4: *Page 4, 3rd Paragraph "Higher concentrations of metals, particularly arsenic, were found in suspected source areas at the Martin Aaron property, which suggest that there may*

also be a site-related contribution of metals. Arsenic may be attributable to the drum reconditioning operations, but is also typically a remnant of tannery operations." USEPA should identify the data that supports its position that the Martin Aaron drum reconditioning operations, as opposed to the tanneries, leather companies and provisional dealers, contributed arsenic to Site soils. Neither the RI, FS nor PRAP support USEPA's contention that "arsenic may be attributable to the drum reconditioning operations...". Information available from USEPA files indicates that Martin Aaron operations were centered in the southeastern portion of the Martin Aaron property, immediately north of the Comarco property. This area does not have elevated levels of arsenic in the soil and groundwater. This would suggest that the Martin Aaron drum operations were not a source of arsenic.

There are numerous other USEPA Superfund Sites where former tanneries operating in the late 1800s and early 1900s have impacted soil and groundwater with arsenic and PAHs (see information on USEPA's website regarding Saco Tannery (Maine), Pownal Tannery (Vermont)). In January 2001, the State of Delaware Department of Natural Resources (DNREC) began the "Tannery Sites Initiative Program" which is a program designed to identify the contributions to soil from former tanneries located in central Wilmington. DNREC has concluded that many former tannery operations are responsible for the presence of arsenic and PAHs in soil and groundwater.

In addition to the historic tannery operations, we suggest USEPA include in the PRAP a discussion of the potential that other business operations contributed to area-wide contamination. Specifically, Kimble Glass Factory, formerly located where the current scrapyard exists, likely contributed arsenic to the soil and groundwater, as arsenic, barium and lead are well-known constituents in glass manufacturing. Also, Camden White Lead Works, which operated around 1900, is a likely source of metals to the soil and groundwater, as would be the former shoe leather manufacturers and slaughterhouses.

EPA response: See EPA's response to Comment S-3 regarding the potential for additional sources other than the drum recycling operations that may have contributed to contamination at the site. With regard to the location of the Martin Aaron, Inc. drum recycling operations, the comment identifies these operations with a portion of the Martin Aaron property just north of the Comarco lot. While the drum recycling businesses did appear to center near the Rhodes Drums building and former Martin Aaron building, removal actions performed by EPA and NJDEP found buried

drums and debris in other areas of the property, and the site operations appear to have covered nearly all the property at one time or another.

Comment S-5: *Page 4, 6th Paragraph "There is some correlation between SVOC concentrations and, for instance, the Martin Aaron building hot spot VOC area on the Martin Aaron property." See Comment S-4. The higher concentration of SVOCs is also coincident with the location of the former tannery process buildings where coal-fired ovens, boilers and furnaces were operated. USEPA and other regulatory agencies have long-recognized the historic use of coal as an energy source has resulted in PAH contamination.*

EPA response: Please refer to EPA's response to Comment S-3.

Comment S-6: *Page 4, 7th Paragraph "The metals appear to be attributable to "historic fill" material or from other sources at these sampling locations, with the exception of arsenic, which appears at concentrations as high as 23,300 ppm at the Martin Aaron building hot spot." As mentioned in Comment S-4 above, the location where arsenic was detected at 23,300 parts per million (ppm) is coincident with the location of the former tannery buildings, in particular the "beam house", which is the primary tannery building. Martin Aaron, Inc. subsequently used that building (or parts of it). Furthermore, the 23,300 ppm cited by USEPA is from a subsurface sample, which would be more likely the result of historic operations as opposed to the more-recent Martin Aaron drum recycling activities. It is therefore misleading to associate the high arsenic concentrations with the so-called "Martin Aaron building hot spot"; rather it is more accurate to associate these concentrations with the "former tannery beam house". Furthermore, USEPA has not provided any information in the Administrative Record to support the claim that Martin Aaron, Inc. contributed arsenic to site soils or groundwater.*

EPA response: See EPA's response to Comment S-3 regarding the potential for additional sources other than the drum recycling operations that may have contributed to contamination at the site. The phrase "Martin Aaron building hot spot" in the Proposed Plan is an effort to identify the location of the hot spot relative to a nearby point of reference. This portion of the site is a area where high arsenic levels and high VOC levels are found either co-located or in close proximity, and it is not unreasonable to identify the area with at least one of the potential sources of the release.

Comment S-7: *Page 5, 4th Paragraph "Groundwater at the site generally moves to the southeast influenced by municipal pumping wells." The RI does not provide any site-specific or direct evidence that the groundwater in the shallow water zone, the Upper PRM Aquifers or the Middle PRM aquifers are being currently influenced by any active municipal wells in the area. USEPA identified the presence of a municipal well approximately 1.75 east-northeast of the site which is an emergency water supply well that is not operational. If it were operated, it would be expected to influence the groundwater to flow to the east-northeast, not to the southeast, which is the current direction of groundwater flow. We suggest USEPA correct the PRAP or include in the RI the information that supports the contention that the groundwater at the Site is under the influence of municipal pumping wells.*

EPA response: Section 4 of the RI describes the groundwater flow direction in the shallow portion of Upper PRM aquifer as being to the east-southeast; and deeper groundwater flow within the Upper PRM Aquifer also being toward the east-southeast along the dip of the local formations. The RI states that the easterly flow is expected to be additionally enhanced by public and industrial supply wells located east of the Site. The RI goes on to state that groundwater within the Middle and Lower PRM Aquifers is expected to flow southeast along the formation dip, and that it may have been altered by heavy pumping in the area. Evidence of southeasterly groundwater flow has been found during the water level measurement activities in the on-site groundwater monitoring wells, as is presented in the potentiometric maps included in the RI.

Comment S-8: *Page 5, 8th Paragraph "Based on groundwater data collected from the RI, a VOC plume, comprised of cis-1,2-DCE, TCE, PCE and several other constituents, has been determined to be over 1,000 feet long and approximately 600 feet wide in the shallow wells (within the first 20 feet bgs)." USEPA should explain in the PRAP that the wells located at the downgradient limits of the plume (but within the area of extraction) contain concentrations of VOCs that are less than USEPA's MCL Cleanup Goal for Groundwater and only slightly greater than NJDEP's Groundwater Quality Standards. For example, in Well MW-9S, which is the first off-site downgradient shallow well, the concentrations shown in Figure 5-45 of the RI Report are as follows:*

- *1,2-cis-DCE = 23 ppb (No Cleanup Goal identified in Table 2).*
- *Tetrachloroethylene = 1.5 ppb (USEPA MCL Cleanup Goal in Table 2 = 5 ppb).*

- *Trichloroethylene = 1.7 ppb (USEPA MCL Cleanup Goal in Table 2 = 5 ppb).*

In Well MW-20S, which is downgradient of Well MW-9S, Figure 5-45 of the RI Report identifies the concentration of trichlorethylene as being 1.6 ppb, which is below the USEPA MCL Cleanup Goal in Table 2 of 5 ppb, and only slightly greater than NJDEP's GWQS of 1 ppb.

In Well MW-11S, the furthest downgradient well from the site, the concentration of trichlorethylene shown in Figure 5-45 of the RI Report is 1.2 ppb, which is below the USEPA MCL Cleanup Goal in Table 2 of 5 ppb and only slightly greater than NJDEP's GWQS of 1 ppb.

Figure 4-10 of the FS illustrates USEPA's concept of the groundwater collection and treatment remedy (GW-5). In that figure, USEPA is proposing to install 3 groundwater extraction wells in the area of the plume where the above-listed monitoring wells document VOCs to be present at concentrations less than USEPA's MCLs or slightly greater than the NJDEP GWQS. These extremely low concentrations of VOCs do not warrant active treatment and the capital cost associated with the well and piping installation or the operational cost to manage and treat the groundwater. Furthermore, USEPA's proposal to extract groundwater in this area is not consistent with its own conclusions in the RI Report that natural attenuation processes for VOCs are occurring at the Site. For example, on page 6-6 of the RI, USEPA states "The fairly strong relationship in relative concentrations between TCE and cis-1,2-DCE indicates that TCE is probably degrading to cis-1,2,-DCE. As concentrations of cis-1,2-DCE are now greater than TCE, the progression of this degradation sequence appears relatively advanced."

EPA response: EPA generally agrees with the interpretation of the groundwater data described above. The FS description of the VOC plume is adequate for the purpose of selecting a remedy for the site. Figures presenting VOC concentrations at various locations in the plume are available in the RI and FS reports.

The conceptual locations of the extraction wells are not based on the contaminant concentrations alone, but also the groundwater flow direction, and on the goal to capture the contaminant plume and prevent it from migrating further downgradient. As discussed in the Decision Summary, EPA expects to perform the soil remedial action first, followed by the groundwater remedial action. The exact locations of the extraction wells would be determined

during the groundwater remedial design process, and based upon data collected after the soil remedy is completed.

Comment S-9: *Page 5, 9th Paragraph "A smaller arsenic groundwater plume exists in the shallow aquifer, with concentrations decreasing with depth." Figure 3 of the PRAP illustrates the concentration of arsenic in the groundwater at a concentration greater than 750 micrograms per liter (ug/l) or parts per billion (ppb), however the figure does not include the data from Well MW-13S. The RI Report provides data for two groundwater sampling rounds; June 2002 and September 2002. USEPA qualified the arsenic result for September 2002 due to data validation issues. The result for the June 2002 sampling event was determined to be valid. The concentration of arsenic in MW-13S in June 2002 was 6400 ppb. Based on this result, the limit of arsenic in groundwater should be reviewed and corrected. In addition, all calculations regarding the cost and scope of the groundwater remedy (i.e. number of wells, treatment costs, etc.) should be reviewed and corrected in the PRAP and FS before a remedy is selected. Furthermore, the June 2002 arsenic data from MW-13S establishes that arsenic impacts are site-wide (in all likelihood from the historic use of arsenic for tannery operations and rodent control and not related to the so-called Martin Aaron operational hot spots).*

It is important to note that correcting the plume to reflect the June 2002 data in well MW¬13S does not change USEPA's conclusion that the arsenic plume is stable and not migrating.

EPA response: In response to this comment, EPA conducted a file review to determine why the arsenic concentration in monitoring well MW-13S was rejected during the September 2002 sampling event. The EPA data validation report, dated October 29, 2002, shows that the sample was rejected because the concentration of the dissolved arsenic sample was higher than the total arsenic sample, and it was concluded that the data should not be used. Figure 5-47 in the RI Report presents the data from only the September 2002 sampling event.

The September 2002 data set was used for the figures in the FS and Proposed Plan since it is the most recent data collected at the site, and the RI Report concluded, incorrectly in this case, that the data in the June and September events was comparable. Though the September 2002 arsenic result was rejected, the data from the June 2002 sampling data for MW-13S could have been reflected in the FS Figure 2-11 depicting the extent of arsenic groundwater contamination. It is, however, unclear whether this data presentation issue materially affects the FS. The

alternatives that include pump-and-treat remedies presented in the FS capture groundwater at MW-13S. The geochemical fixation costs for implementing Alternative G4 would likely increase to address a larger area of groundwater contamination. Should there be arsenic concentrations in the well that are above the clean-up criteria, the area will be remediated by the selected alternative. Sampling events conducted in conjunction with the implementation of the remedy will verify the arsenic concentration in monitoring well MW-13S.

Comment S-10: *Page 6, 7th Paragraph "The human health risk assessment evaluated exposure to surface and subsurface soils at the Martin Aaron property, the scrap-yard, and the properties adjacent to the facility under several exposure scenarios, including current trespasser exposure to surface soils, future exposure to surface and subsurface soils by commercial/industrial workers and construction workers, as well as future use of groundwater as a potable water supply." Groundwater in the Camden area is classified as a Class IIA aquifer and is considered a potential drinking water source. USEPA, however, acknowledged that the majority of the contamination in the shallow groundwater occurs within the upper 20 feet, the first 10 feet of which consists of historic fill (See Page 5 of the PRAP). This is an unlikely zone for the installation of a potable well due to issues associated with natural and background water quality conditions and yield. Furthermore, NJDEP regulations prohibit the completion of a well with a screen in the uppermost 20 feet. Other issues such as total dissolved solids, or other surface contributions to the shallow water-bearing zone preclude the use of this zone for potable uses without treatment. Finally, local and State ordinances may eliminate the drilling of potable wells within this localized area.*

On page 2-5 of the FS, USEPA states "There are currently no complete exposure pathways to contaminated groundwater beneath the Martin Aaron Site because there are no known contaminated wells in use. All resident in the area of the Martin Aaron Site are currently on city supplied water." Also, during the remedial action phase, a Classification Exception Area (CEA) will likely be established which will prohibit the use of the groundwater in the foreseeable future.

Based on the information provided, USEPA's assertion that shallow groundwater in the area of the Site may be used as a future potable water supply is overstated and unrealistic. Therefore, it should not be used as a primary basis to select a groundwater remedy or to suggest that a costly pump and treat groundwater remedy is appropriate (as in Alternative GW-5).

EPA response: The remedial action objectives for groundwater include preventing human exposure but also remediating groundwater to the extent practicable and minimizing further migration of contaminants in groundwater. These objectives are consistent with the NCP expectations with regard to remediation of groundwater, 40 CFR 300.430(a)(iii)(F). The Proposed Plan states (and the Decision Summary further clarifies) uncertainties with regard to implementing the selected groundwater remedy, and conditions may arise during remedial action that limit the degree to which the groundwater Cleanup Goals can be achieved. That should not, however, prevent EPA from selecting a remedy that attempts to meet these remedial action objectives to the extent practicable.

Comment S-11: *Page 8, 3rd Paragraph "Targets (referring to soil cleanup goals) were selected that would both reduce risk associated with exposure to soil contaminants to an acceptable level and ensure minimal migration of contaminants off the site." USEPA has not provided the data or documentation that supports a conclusion that the cleanup goals selected by the agency for soil will "ensure minimal migration of contaminants off the site". No information regarding a fate and transport analysis or other scientific analysis of contaminants in soil or groundwater was presented in the FS or the RI. We request that the agency provide the results of a scientific site-specific study that supports the agency's conclusion regarding the level at which compounds in soil will contribute to groundwater impacts.*

USEPA has not provided the data or observations that support a conclusion that migration of contaminants in the soil is occurring off-site. USEPA's selection of RAOs to "ensure minimal migration of contaminants off-site" appears to be in direct contradiction to statements made by USEPA on page 6-5 of the RI, as follows:
"The overall decline in contaminant concentrations with time, from 1997 to 2002, in the Surficial Upper PRM Aquifer would suggest that the contaminant plume was receding over this time period."

In that same paragraph, the RI states:
"Typically, under receding conditions, the contaminant plume has expanded to a maximum extent."

USEPA should explain why target soil cleanup goals were selected to "ensure minimal migration of contaminants off the site" when its own RI Report concludes that the plume is receding and had reached its maximum extent.

EPA response: Section 6 of the RI Report, "Contaminant Fate and Transport," assesses the potential for off-site migration based upon current and potential future site conditions. The two quoted statements in the comment above are assessments of groundwater contaminant concentrations, while the questions proposed in the comment, regarding migration of contaminants off site, refer to the soil remedial action objectives. While declining concentrations in the groundwater plume in the Surficial Upper PRM Aquifer may be occurring, the soil remedial action objective to "ensure minimal migration of contaminants off the site" is still an important remedial objective.

The Proposed Plan identified "direct contact Cleanup Goals" for soils, and "Source Area Cleanup Goals" for soils. EPA concluded that VOCs and arsenic are present on the site at levels that constitute sources of groundwater contamination, and that constituted the principal threats posed by the site; therefore the Proposed Plan identified Source Area Cleanup Goals for Arsenic and VOCs contamination in soils. Even if the groundwater were not already contaminated with these site contaminants (i.e., if the Source Areas posed a threat of off-site migration, but there was no evidence of actual migration), EPA typically takes remedial actions at NPL sites to address principal threats to eliminate the threat of contaminant migration in the future. The NCP establishes an expectation that EPA will use treatment to address principal threats posed by a site wherever practicable, with the goal of identifying permanent solutions for the worst of site contamination.

Comment S-12: *Page 8, 6th Paragraph "Based upon communications with the City and other interested parties, including supporters of the Waterfront South redevelopment project, reuse expectations for the Martin Aaron property and neighboring properties are for commercial redevelopment." USEPA's preferred alternative for groundwater, G-5 (extraction and treatment) will render portions of the Martin Aaron property (and perhaps adjacent properties) unsuitable for redevelopment for the foreseeable future (minimum of 10 years, by USEPA's own determination of the duration of alternative G-5). Analysis by McLane would indicate that a significantly longer time (on the order of 100 years) might be needed to remediate the arsenic in the groundwater through extraction (see Exhibit B). Alternative G-5 will require a treatment building of significant size (unlike what is portrayed in Figure 4-10 of the FS). Alternative G-5 will also require outside material and equipment storage areas, parking, site security, wells, underground piping, utilities, lighting and*

other components known to be needed to support a treatment plant capable of treating up to 100 gpm for metals and VOCs.

USEPA should re-examine its decision to select pump and treat in the context of the community's interest in having this site put back into productive use.

EPA response: EPA disagrees with the majority of this comment. Pump and treat facilities have been built in conjunction with groundwater remedies at many Superfund sites for over 25 years. Although the exact dimensions of the building will not be determined until the remedial design process, there is little evidence that the location of a treatment building on site would render the site unusable for redevelopment. Further, the majority of the pump and treat piping (with the exception of where it enters the building) will be below ground, leaving a large portion of the site with the potential for reuse.

Groundwater extraction and treatment of metals has been performed at many Superfund sites. The FS used the available site-specific data to estimate timeframes for the operation of treatment technologies in the various alternatives. The amount of time needed for the remediation of the arsenic through extraction and treatment will be further determined during the remedial design.

Comment S-13: *Page 8, 7th Paragraph "Soil contamination on the Martin Aaron property, the scrapyard, and on portions of Comarco Products and the Ponte property appear to be attributable to the Martin Aaron Superfund site." The meaning of this statement is unclear and USEPA should clarify the intent of this statement. It is confounding to attribute contamination located on these properties to the Martin Aaron Site when these properties currently define the Martin Aaron Site.*

If USEPA is attempting to attribute contamination on these properties from the Martin Aaron drum reconditioning operations, then USEPA should examine the historical air photos and Sanborn maps. These maps clearly show that by 1940, those portions of the Comarco property and Ponte property that have contamination are not readily accessible from the Martin Aaron property due to the presence of major, multi-story buildings. This information was provided to USEPA prior to the issuance of the PRAP and is in the Administrative Record for review. With these substantial buildings present (which are know to have been built on concrete/brick subsurface foundations), there is no reasonable transport mechanism that would permit contaminants from the Martin Aaron drum reconditioning operations to migrate laterally in the unsaturated soil to the Comarco, Ponte and row home

properties. It is reasonable to conclude that soil conditions in these areas are the result of pre-existing operations (e.g., tanneries, slaughterhouses) independent of and unrelated to the Martin Aaron drum recycling activities.
USEPA must re-evaluate its position regarding the source and attribution of soil contamination in light of the large volume of historical information, and revise the RI, FS and PRAP accordingly.

EPA response: The statement from the Proposed Plan, "Soil contamination on the Martin Aaron property, the scrapyard, and on portions of Comarco Products and the Ponte property appear to be attributable to the Martin Aaron Superfund site," should not be taken out of context. The rest of the paragraph discusses contamination on adjacent properties being attributable to other sources or "historic fill," and a distinction is made between the areas with only "historic fill" and areas where site operations may have contributed to the contamination. The broadest definition of "site operations" includes any and all activities that may have contributed to contamination, in this case including, but possibly not limited to, a tannery and drum recycling. Because of a long history of industrial land use in the area, EPA has attempted to identify other potential sources of contamination from neighboring properties (particularly from the former lead smelter across Sixth Street), and to address releases that are attributable to the NPL site and those that can be addressed through other regulatory methods.

Comment S-14: *Page 8-9, 2nd and 3rd Bullets*

- *Remediate groundwater to the extent practicable and minimize further migration of contaminants in groundwater; and*
- *Restore the groundwater to drinking water standards within a reasonable time frame.*

These two RAOs appear to be in conflict with each other as to what is meant by "extent practicable" in the first bullet and "reasonable time frame" in the second bullet. It is believed, based on page 2-5 of the FS, that the first RAO is related to the "source areas" and the second to areas beyond the "source areas". USEPA should clarify the definition of these terms and correct the PRAP such that the public can have a correct understanding of the difference between these two RAOs.

In addition, the FS and PRAP fail to recognize background concentrations in groundwater when establishing site-specific groundwater cleanup goals. The State of New Jersey recognizes the presence of background contamination in determining the need for site remediation as follows:

"Groundwater that is contaminated shall not be required to be remediated to a level or concentration for any particular contaminant lower than the level or concentration that is migrating onto the property from another property owned and operated by another person." N.J.S.A. 58:10B-12g.(6).

The concentration of arsenic in monitoring well MW-17S, which USEPA has interpreted to be upgradient of the Martin Aaron property (see Figure 4-8 of the RI (Potentiometric Surface Map, Surficial Upper PRM Aquifer, September 2002)), contained 584 ppb of arsenic in September 2002. Therefore, the remedial action goal for arsenic in groundwater at this Site should be no less than 584 ppb - the level of arsenic migrating onto the property from upgradient, off-site sources.

Also, it is not appropriate for the agency to issue a PRAP or an FS on the basis of the limited groundwater analytical data collected to date. Specifically, two rounds of groundwater samples collected in 2002 are insufficient to support the selected remedy. In addition, USEPA has neglected to account for the natural groundwater quality in the area.

The shallow Upper PRM aquifer is unsuitable for drinking without pre-treatment due to the historic impacts from the industrial development and use of the area. The natural occurring elevated levels of metals such as iron and manganese, in addition to the metals that are associated with historic fill throughout Camden, make it unrealistic to set "in-aquifer" remedial action goals as drinking water standards. It is inappropriate to establish drinking water remedial goals for this site while not requiring the same level of effort throughout the basin.

EPA response: Remedial action objectives provide a general description of what the cleanup will accomplish. These goals typically serve as a basis for the development of the remedial alternatives in the FS and the Proposed Plan, and give a basis for assessing the cleanup options for the site. Remedial action objectives also describe how the risks identified in the baseline risk assessment will be addressed by the response action. In this case, the groundwater Cleanup Goals, MCLs or groundwater quality standards, are derived from the remedial action objectives. At this site, the remedial action objectives also acknowledge the uncertainties inherent in attempting to remediate the arsenic plume, by developing goals that the remedy be performed "in a reasonable time frame" and "to the extent practicable".

EPA disagrees with the assertion that background concentrations in groundwater were not taken into consideration when establishing site-specific groundwater cleanup goals. The FS specifically discusses the development of preliminary remediation goals (PRGs) based on a variety of factors, including background concentrations where applicable. Although EPA acknowledges that monitoring well MW-17S is upgradient of the Martin Aaron property (as opposed to the Martin Aaron site), it is not considered to be a background well for arsenic concentrations. As can be seen in Figure 2-11 of the FS, MW-17S is well within the arsenic plume, and the remedial goal for arsenic. As is the case in the majority of sites listed on the NPL, the groundwater sampling conducted at the Martin Aaron site has determined that contamination exists at levels above those that are protective of human health and the environment, and EPA has determined that remedial action is required. The groundwater Cleanup Goals are promulgated standards and, therefore, ARARs. CERCLA requires EPA to comply with ARARs to the extent practicable, or provide a basis for a waiver. Based upon the number of upgradient and side-gradient monitoring wells at the site, there is no evidence of an "off-site source" of arsenic, as implied by the comment, or of regional arsenic contamination that would serve as a basis for a waiver of the groundwater ARARs or a cleanup to background levels.

Comment S-15: *Page 9, 1st Paragraph "If contaminated groundwater is used as drinking water in the future, significant health risks would exist." Comment: See Comment S-10.*

EPA response: See response to comment S-10.

Comment S-16: *Page 9, 2nd Paragraph "Groundwater within the source area must be remediated to the extent practicable. The presence of clay and silt stringers within the uppermost water bearing zone and high contaminant concentrations in groundwater (specifically arsenic), make it difficult to restore groundwater to the MCLs or the New Jersey groundwater quality concentrations (GWQCs) in the foreseeable future, even with active remediation of groundwater." USEPA's preferred alternative for groundwater (G-5, Groundwater Collection and Treatment) states that "it has been estimated that this system would be operated for 10 years to restore (emphasis added) the aquifer." We request that the agency explain the apparent conflict between these two statements, as well as with others in the FS as noted in Comment G-4. We suggest that USEPA's recognition of the difficulty in restoring groundwater in the foreseeable future underscores the reason why the pump and treat remedy proposed by the agency is not the correct remedy. While this comment refers to the*

apparent contradiction in USEPA's statement, it is again noted that USEPA needs to re-evaluate its estimated time frame for aquifer restoration, as discussed by McLane (Exhibit A).

EPA response: The objective of the Proposed Plan is to present the preferred remedial alternative for remedial action at the Martin Aaron site, and make the document available for public comment. As such, estimates made in the FS and Proposed Plan are based upon the best information available at the time. Although EPA does not agree with the estimate that it will take 100 years to restore the aquifer with the chosen groundwater alternative, the estimate on time needed will be further determined during the remedial design phase. The Proposed Plan explained the agency's remedial expectations, but also acknowledged the uncertainties inherent in groundwater remediation at this site; these two tasks not contradictory.

Also, see EPA's response to Comment G-4.

Comment S-17: *Page 9, 5th Paragraph "Alternatives S2 through S6 include the demolition of at least the Rhodes Drums building (the section on the Martin Aaron property)." Figure 1 of the PRAP does not properly characterize the extent of the Rhodes Building. As USEPA has recognized in the PRAP, the Rhodes Drum Company only utilized the portion of the one-story building that is on the Martin Aaron property. Martin Aaron did not use the portion of the one-story building that is on the Ponte Property. We suggest the figure be annotated to clearly show the portion of the one-story building to be demolished.*

The one-story building off of the Martin Aaron property is not shown as being owned by any entity in the legend. USEPA should identify the owner of this building and correct the figure.

EPA response: As identified in the text of the Proposed Plan the owner is a company identified as "Ponte Equities". As stated above, the objective of the Proposed Plan in choosing a preferred alternative in the Superfund cleanup process is to protect human health and the environment from contamination in site soils and groundwater regardless of the original source of contaminants or property ownership. The exact portion of the Rhodes Drum Building that needs to be demolished will be determined during remedial design.

Comment S-18: *Alternative S-4 - Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils, Page 11, 1st Paragraph "This alternative includes excavation of approximately 28,000*

cubic yards of both the VOC and arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary to allow for land disposal. The unexcavated portions of the Martin Aaron site, an area of approximately 2.0 acres where soils exceed the direct-contact Cleanup Goals, would be capped as presented in Alternative S2 and S3." On Page 1 of the PRAP, the Martin Aaron site is described as being 2.4 acres in size. The above statement indicates that approximately 2.0 acres of the Site will not be excavated; leaving approximately 0.4 acres is to be excavated. To obtain 28,000 cubic yards of soil from 0.4 acres would require excavation depths to over 40 feet - the FS assumes excavation to only 10 feet. We request that this apparent discrepancy between area and volume be clarified.

A review of the soil testing data in the RI indicates that a significant portion of those areas proposed for remediation do not contain contaminants above USEPA's source levels in the upper 5 feet of soil. USEPA has stated that further delineation is needed prior to remediation. Please confirm that USEPA will permit reuse of excavated soils that contain contaminant concentrations below the remedial action goal(s).

EPA response: The volume of soil to be excavated was estimated based on the size of the arsenic and VOC hot spot areas, as described in more detail in the FS. As stated throughout the FS and Proposed Plan, the volumes were estimated for costing purposes and were based on the resulting data in the RI. However, a more exact volume estimate will be developed during the remedial design and will require additional investigations.

EPA has had mixed success in reusing, as fill material, excavated soils that appear to contain concentrations below the remedial action goals. This issue can be explored in more detail during remedial design.

Comment S-19: *Page 11, 1st Paragraph "For cost estimating purposes, the FS assumed 30 percent of the excavated soil would undergo treatment prior to disposal." It should be clarified in the PRAP that on page 4-7 of the FS, it was assumed that 50% of the soil containing arsenic greater than 300 ppm would require treatment. Since USEPA assumes that the total volume of soil requiring treatment for arsenic is 16,000 cubic yards, 8,000 yards would require treatment, which is approximately 30% of the total combined volume (28,000 cubic yards) of soil to be excavated for arsenic and VOCs.*

As noted above, the existing soil data indicates that shallow soils in the areas proposed for excavation do not exceed the

source area threshold levels and we request the agency confirm that these soils can remain on-site under the proposed asphalt cap.

EPA response: At page 4-7, the FS text states, incorrectly, that 50 percent of the soils were assumed to require treatment prior to land disposal to satisfy RCRA LDRs. In fact, as shown in Appendix B - Detailed Cost Tables for Alternative S4 of the FS and correctly stated in the Proposed Plan, 30 percent was conservatively assumed for cost estimating purposes. Refer to EPA's response to Comment S-18 regarding the potential for returning excavated soil to the site.

Comment S-20: *Page 11, 2nd Paragraph "Excavated areas would be backfilled with clean fill." See Comment S-20.*

EPA response: EPA believes the comment above should read "See Comment S-18". As such, see EPA's response to Comment S-18.

Comment S-21: *PRAP Section: Alternative S6 -Excavation and Off-Site Transportation of Residual Soils and Source Areas with Treatment as necessary prior to Land Disposal, Engineering Controls, Page 11, 7th Paragraph "The depth of excavation varies from two feet to a maximum of about 10 feet". The FS is clear that the excavation depth of a Source Area is assumed to be 10 feet across the entire area. The FS does not contemplate that the depth of excavation will vary between 2 and 10 feet. USEPA should clarify if varying soil excavation depths were contemplated in the FS and on what data those varying depths were based.*

EPA response: For cost estimating purposes, the FS assumed an excavation depth of 10 feet across the affected area. As stated throughout the FS and Proposed Plan, the volume estimates were developed for cost-estimating purposes. The volume of soils that actually exceed the Cleanup Goals will be determined during the remedial design phase.

Comment S-22: *Page 12, 3rd Paragraph "None of the groundwater alternatives would fully remediate the groundwater without an active soil remedy." Neither the RI nor the FS provides scientific support of this statement. In fact, the RI provides and discusses direct lines of evidence to the contrary--that VOCs in the groundwater are undergoing remediation due to natural processes.*

We request the agency clarify what is meant by "fully remediate the groundwater". In clarifying this statement, USEPA should

recognize that the RI Report discusses upgradient sources of groundwater impact (background). Shallow wells MW-1S and MW-16S are located along the upgradient limit of the Martin Aaron property. Both wells show evidence of contamination, suggesting that there are upgradient sources of VOCs and metals (including arsenic) contributing to the overall groundwater conditions across the site. Other upgradient wells also show evidence of off-site sources of contamination.

USEPA should also re-evaluate the remedial action goal since the groundwater in the Camden area has been impacted by historical operations and fill material.

EPA response: Although the RI does discuss natural attenuation of VOCs within the plume, there is not clear evidence that VOC concentrations in groundwater beneath the site are decreasing, only that VOCs appear to be biodegrading, and that biodegradation may be limiting the degree of off-site plume migration. An unambiguous conclusion of the site characterization is that site soils are a source of the VOC and arsenic contamination in groundwater. That the types of groundwater remedies available at this site would be made less effective if the soil sources are not addressed is also a well-supported conclusion.

EPA does not consider monitoring wells MW-1S and MW-16S to be background wells, as they are located on the former Martin Aaron Property, and within the area of the groundwater plume; neither does the RI identify monitoring wells MW-1S and MW-16S as background wells. The RI does, however, discuss potential background levels of VOC and metals contamination in wells located on Everett and Sixth Streets, and wells on the SJPC property are also probably indicative of local groundwater conditions. The RI particularly mentions naturally occurring metals in the PRM Aquifer system and states that sources of metals contamination may be present off of the Martin Aaron property. The FS discuses the development of preliminary remediation goals (PRGs) based on a variety of factors, including background concentrations, where applicable.

EPA does not believe that the remedial action goals need to be re-evaluated. While industrial activities in Camden have probably created regionally poor groundwater conditions in some parts of the city, there is little evidence of a significant regional component to the groundwater contamination in the monitoring wells installed near the site.

Comment S-23: *Page 12, 6th Paragraph "If an active soil remedy addresses the source areas, but no groundwater action is taken, VOC and arsenic plumes would still persist for a number of years*

(roughly estimated over 50 years)." USEPA does not provide in the RI, FS nor PRAP how the agency determined an estimate of "over 50 years". To the contrary page 4-9 in the FS states "There is evidence of biological reductive dechlorination of the CVOCs because of the presence of the degradation products cis 1,2-DCE and vinyl chloride." The RI provides a more thorough explanation of the conclusion that natural attenuation of VOCs is occurring at the Site.

Regarding arsenic, the FS provides on Page 4-10 that, "Natural attenuation mechanisms for metals such as arsenic are much more limited because they are elements that do not degrade. However arsenic in groundwater is present in the more soluble reduced species. The arsenic would be expected to precipitate onto the aquifer matrix over time as the shallow upper PRM aquifer slowly returns to aerobic oxidizing conditions. The time for this to occur is dependent on the rate of oxygen and transfer to the shallow aquifer and the degree to which the oxygen will be utilized by microorganisms present in the aquifer to degrade organic substrates. The time needed for this to occur can be estimated based on natural attenuation data collected as part of this alternative."

The agency has acknowledged that both VOCs and arsenic are capable of natural attenuation and the PRAP understates the conclusions on page 6-6 of the RI (i.e. "... progression of this degradation sequence appears relatively advanced."). There needs to be more analysis performed before MNA can be eliminated as a remedy for groundwater. Elimination of this groundwater alternative without such study and analysis is premature and without scientific justification.

As McLane Environmental concludes, USEPA does not provide a scientific basis or reasonable explanation how the agency estimated the remedial time frames for some of the groundwater remedies (Exhibit B). For example, the PRAP states that MNA may take 40 years, however on page 4-10 of the FS the USEPA states "The time needed for this (MNA) to occur can be estimated based on natural attenuation data collected as part of this alternative." Accordingly, the FS acknowledges that the data necessary to estimate the MNA time frame has not been collected. There are no calculations provided in the FS that support the time frame cited by USEPA in the PRAP.

In the FS (page 5-10) USEPA estimates the mass of contaminants present in the water-bearing zone. Specifically, USEPA estimates that there are 9 lbs. of VOCs and 40 lbs. of arsenic in the upper PRM. Unsupported estimates translate into significant

uncertainty relative to estimated remedial time frames and should not be used as a basis for remedy selection.

EPA response: EPA has acknowledged throughout the RI, FS, and Proposed Plan that natural attenuation of VOCs may be occurring in the aquifers beneath the site. As is stated throughout the FS and Proposed Plan, volume and time estimates used in the remedial alternatives are: developed for cost-estimating purposes; are subject to many variables; are based upon the best available information; and, are developed for comparison of remedial alternatives as part of a nine-criteria evaluation.

The comment's speculative assessment of the natural attenuation potential for arsenic assumes that certain trends in aquifer conditions would occur in the future, and that the immobilization of arsenic into the aquifer matrix would be irreversible. While at some sites natural attenuation of metals, for example, through sorption or oxidation-reduction reactions, does occur, there is little to support a case that it is actually underway at this site.

Comment S-24: *PRAP Section: Alternative G2 - Monitored Natural Attenuation (MNA) and Institutional Controls, Page 13, 2nd Paragraph "Studies performed during the RI indicate that natural attenuation of VOCs is probably underway." See Comment S-23. USEPA recognizes natural attenuation is occurring at the Site. Without appropriate analysis, USEPA should not summarily dismiss natural attenuation as a stand-alone remedy for VOCs.*

EPA response: Comment noted. As stated previously, EPA has acknowledged throughout the RI, FS, and Proposed Plan that natural attenuation of VOCs is probably occurring at the site. See EPA Response to Comment S-23.

Comment S-25: *Page 13, 2nd Paragraph "The prospects for natural mechanisms to decrease the concentration or mobility of arsenic in groundwater are very limited." The FS does not support this statement. To the contrary, on Page 4-10, the FS indicates that additional data needs to be collected before the natural attenuation time frame for arsenic can be estimated. USEPA should explain why the additional studies were not performed to further evaluate this option. These studies should be performed before a final remedy is selected.*

EPA response: Please refer to EPA's response to Comment S-24, regarding MNA for arsenic.

Comment S-26: *PRAP Section: Alternative G3 - Containment with Hydraulic Controls, Page 13, 9th Paragraph "If coupled with an active source control remedy for the soils, preliminary calculations estimate a time frame of 20 years to completely remediate the aquifer." Neither the RI nor the FS provide the scientific support for USEPA's preliminary estimated remedial time frame for this alternative of 20 years. Please provide the supporting documents and analysis that confirm the 20-year estimate. A final remedy should not be selected until these types of studies are performed.*

EPA response: As is stated throughout the FS and Proposed Plan, volume and time estimates used in the remedial alternatives are: developed for cost-estimating purposes; are subject to many variables; are based upon the best available information; and, are developed for comparison of remedial alternatives as part of a nine-criteria evaluation.

Comment S-27: *PRAP Section: Alternative G4 - Geochemical Fixation and MNA, Page 14, 2nd Paragraph "Geochemical fixation involves introducing a polymer into an area with high arsenic concentrations." As discussed by Parsons, the use of polymers (such as calcium polysulfide solutions) is only one type of in-situ geochemical fixation option (Exhibit B). Other sites containing arsenic in groundwater are using a solution of hydrogen peroxide and ferric chloride to immobilize this metal. We suggest USEPA evaluate the range of chemical fixation technologies that are currently being employed at other sites before the evaluation of this alternative can be considered complete. A final remedy should not be selected until these types of studies are performed.*

EPA response: Section 3 of the FS, "Identification and Screening of Technologies" presents a detailed process of how the remedial alternatives were developed from the potential technologies that were considered. Further information can be found in Table 3-2 of the FS. As discussed in the "Comparison of Remedial Alternatives" section of the Decision Summary, a number of factors led to the selection of this method of geochemical fixation as the representative technology for this remedial alternative. The Selected Remedy allows for the performance of treatability studies to evaluate this and potentially other *in situ* technologies at the site as groundwater remedies.

Comment S-28: *Page 14, 2nd Paragraph "A pilot study to evaluate methods of distributing chemicals and resulting effectiveness would be required prior to full scale injection" We concur that*

pilot studies should be conducted to evaluate this alternative prior to selecting alternative G-5, or another alternative.

EPA response: Comment noted. The referenced statement from the Proposed Plan does not recommend that a pilot study be performed prior to selection of alternatives. Rather, it states only that a pilot study would be needed if this alternative was selected.

Comment S-29: *Page 14, 3rd Paragraph "If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer." Neither the FS, RI nor PRAP provide for review of the preliminary calculations that form the basis of the 40-year time frame. We request the agency provide them for review. Notwithstanding the existence of this data, USEPA should explain how time frames could be estimated without conducting the necessary pilot studies.*

EPA response: See EPA Responses to Comments S-25 and S-26.

Comment S-30: *PRAP Section: Alternative G5 -Groundwater Collection and Treatment, Page 14, 4th Paragraph "In order to determine if chemical precipitation would be necessary, contaminant concentrations were estimated for the collection system discharge and compared against the CCMUA pretreatment limits. Arsenic was the only groundwater contaminant that may exceed the limits." The details of the comparison mentioned in the PRAP are found on Page 4-11 of the FS.*

Table 4-3 (Expected Groundwater Concentrations and POTW Discharge Limits) of the FS compares the expected contaminant values in the groundwater to the proposed treatment plant and the POTW discharge limits. The FS states "All of the VOCs detected in groundwater at the Site are below the CCMUA limits." However, Table 4-3 does not identify the POTW limits for VOCs. In addition, the FS states that pretreatment for inorganics might not even be necessary based on the evaluation in Table 4-3.

The evaluation provided in Table 4-3 involves calculating the average concentration of each compound from 19 wells at the Site and comparing those averages against those anticipated as POTW limits. This evaluation is misleading, since not all of the wells included in the average calculation are within the areas identified for groundwater extraction. For example, the "expected" influent concentration for arsenic is calculated in the FS to be approximately 754 ug/l. However, when only those wells near the proposed extraction wells are used in the average (Wells MW-1S, 5S, 13S, 15S, 16S and 17S), the average arsenic

concentration is 2335 ug/l -- twice the POTW limit shown in the table. This would suggest that the scope and cost of the pump and treat alternative is underestimated.

A CCMUA POTW Effluent Limitations Table from another Superfund site in Camden County was compared against the groundwater data for the Martin Aaron site. In addition to arsenic, cadmium and lead are present in the groundwater at the Martin Aaron Site at concentrations that exceed this other site's permit and would require treatment prior to discharge. USEPA should use an existing permit for evaluation of the potential need for pretreatment. The FS and PRAP should be corrected to use existing permitted discharge limits, rather than "expected" limits.

Additionally, the CCMUA may require flow control on the amount of water acceptable for discharge. Flow control has a direct impact on the duration of any remedy.

EPA response: In developing Alternative G-5, EPA used standards and requirements obtained directly from the CCMUA. While EPA also has consulted the permit conditions from another Superfund described in the comment, EPA does not agree that it should have used an existing permit for an unrelated site in lieu of evaluating site-specific criteria based on requirements obtained directly from CCMUA. The CCMUA does not publish limits for specific VOCs, rather they evaluate against the Total Organic Toxic Concentration (TTO). As presented in Table 4-3 of the FS, the CCMUA has set the VOC limit at a TTO of 5,000 ppb. The TTO for the Martin Aaron Site, as presented in Table 4-3of the FS, is 147.64 ppb, which is well below the CCMUA POTW standards. The FS provides the required information in detail on how the expected groundwater concentrations and POTW discharge limits were developed. In addition, the proposed remedy for groundwater includes chemical precipitation to remove the arsenic to below CCMUA POTW limits prior to discharge.

Comment S-31: *Page 14, 6th Paragraph "If combined with an active soil remedy to address the Source Areas, it has been estimated that this system would be operated for 10 years to restore the aquifer." No calculations or assumptions that support this statement are provided in the RI, FS or PRAP for public review. We suggest the analysis be provided so that the public can complete a thorough evaluation of the PRAP.*

There are few (if any) Superfund sites in the country where groundwater extraction and treatment has restored the aquifer in

10 years, and many have operated well beyond the estimated duration.

EPA response: See EPA Response to Comment S-26.

Comment S-32: *Page 15, 1st Paragraph "Alternative S2 relies primarily on capping and institutional controls to meet the remedial action objectives and does little on its own to address the arsenic and VOC hot spots." On page 2-5 of the FS, one of USEPA's RAOs is to "remediate contaminated soils to control leaching." The RI and FS further explain that the mechanism to transport residual VOCs and arsenic to the groundwater is by infiltration of surface water. On page 4-2 of the FS, a multi-layer, low permeable asphalt capping systems is described with the objective of "minimizing infiltration in the areas where leaching is of greatest concern." This is not the capping system USEPA presented in Alternative S-2 of the PRAP, which is a single-layer asphalt capping system designed to eliminate direct contact. We request the agency explain why the multi-layer capping system described in the FS was not carried forward into the PRAP as an alternative that achieves the RAOs for soil.*

EPA response: The FS Report, developed by EPA's consultant CH2MHill, included a multilayer impermeable cap system in its version of Alternative S2. In EPA's assessment, the value of the cap was used as a method of preventing direct contact. If the site was to be redeveloped, over time a more complex impermeable system would be an unreliable method of preventing infiltration, the only "source control" technique attributable to this alternative. EPA retained the concept of an engineering control to prevent direct contact, but did not expect this alternative to provide a satisfactory source control remedy. As discussed in the Proposed Plan, EPA expected that Alternative S2 could be implemented together with Alternative G3 (hydraulic control) to act as a containment remedy for the site.

Comment S-33: *Page 15, 3rd Paragraph "...none of these alternatives are expected to remediate the groundwater without the aid of a complimentary soil remedy that addresses the soil Source Areas." As mentioned in prior comments, USEPA has not provided for review the results of any scientific testing or evaluation that demonstrates levels of VOCs and arsenic in soil which are contributing to groundwater conditions.*

EPA response: Please refer to EPA's response to Comment S-22.

Comment S-34: *Page 15, Paragraph 9 "Depending upon the selected soil remedy, the most highly contaminated arsenic in groundwater*

would not recover in a reasonable time frame." There appears to be an inconsistent presentation in the PRAP on what USEPA considers to be a "reasonable time frame" for remediation.

- *On Page 14, 3rd Paragraph, USEPA states "If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer."*
- *On Page 17 of the PRAP, USEPA states "Alternative G2 would reach the Cleanup Goals in 45 years, through natural attenuation, after the source is removed."*
- *On Page 19, US EPA states "With the removal of VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame."*

Since USEPA believes that VOC impacted groundwater can be cleaned up in a reasonable time period (i.e. 45 years) it should explain why a 40 year clean up time period for arsenic is not also considered reasonable.

EPA response: Portions of text from the Proposed Plan, quoted above, are taken out of context and not in their entirety. For example, the Proposed Plan states the following: "Depending upon the selected soil remedy, the most highly contaminated arsenic in groundwater would not recover in a reasonable time frame under Alternative G2." The quote presented in the first bullet refers to Groundwater Alternative G4. The quote presented in the 3rd bullet is also not presented in its entirety and should read "With the removal of VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame; however the same cannot be said for the arsenic contamination." When the text above are put into the context from which they were taken, the Proposed Plan clearly indicates that 45 years is not considered a reasonable time frame, and thus suggests that removal of soil and groundwater source areas would aid in reducing the cleanup time frame.

Comment S-35: *Page 16, 2nd Paragraph "In addition, the presence of clay and silt lenses within the shallow aquifer will make restoration difficult, especially for arsenic, since metals tend to sorb onto clay particles making them difficult to remediate." This statement appears to contradict USEPA's representation that groundwater extraction for arsenic remediation will achieve the RAOs in approximately 10 years. The absorptive nature of arsenic to clay particles renders the arsenic immobile, which explains why the arsenic plume is limited in aerial extent despite the fact that tannery operations ended at the site more than 75 years ago. The plume is static which contradicts the agency's representation in the PRAP that a "more aggressive" remedy for*

groundwater is necessary (i.e. groundwater extraction compared to natural attenuation).

EPA response: Please refer to EPA's response to Comments S-10, S-14 and S-16 regarding uncertainties in implementing groundwater remedies, and Comments S-23 and S-26 regarding timeframes and cost estimates taken from the FS. The comment's "explanation" of for the limited mobility of the arsenic plume is, of course, speculative, though sorption is a likely factor.

Comment S-36: *Page 16, 3rd Paragraph "Alternative G4 (Geochemical Fixation and MNA) ranks higher than Alternatives G3 (Hydraulic Containment) and G5 (Collection and Treatment) for the arsenic plume because the arsenic is quickly treated after injection, curtailing or eliminating mobility." In the PRAP, USEPA makes the case that arsenic contamination in groundwater may be difficult to remediate (see comment above). The concentration of VOCs and their propensity to remediate through natural attenuation strongly suggests that the groundwater remedy for the Site should focus on arsenic. We request the agency explain why Alternative G4 should not be the Preferred Alternative, or at a minimum, more fully evaluated before selecting a more costly and likely longer-term remedy such as pump and treat.*

EPA response: All of the alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria required by the NCP. The evaluation presented in the FS, Proposed Plan, and Decision Summary provide the details of why groundwater Alternative G5 was selected. The Selected Remedy allows for the performance of treatability studies to evaluate *in situ* technologies at the site as groundwater remedies during remedial design.

Comment S-37: *Page 17, 2nd Paragraph, "Alternative G4 employs a treatment technology, geochemical fixation, that reduces the toxicity and mobility of arsenic, though it does not address the VOC contamination." Also, "Alternatives G4 and G5 offer a comparable level of improvement in mobility and toxicity reduction…" With respect to arsenic remediation, USEPA ranks Alternative G4 equal to or higher than G5, yet chooses G5 as the Preferred Alternative. We request the agency explain why Alternative G4 should not be the Preferred Alternative, or at a minimum, more fully evaluated before selecting a more costly remedy such as pump and treat.*

As previously mentioned the areas of VOC contamination and elevated arsenic in groundwater generally do not overlap.

Therefore, different approaches can be applied to the VOC and arsenic plumes.

EPA response: All of the alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria required by the NCP. The evaluation presented in the FS and Proposed Plan provide the details of why groundwater Alternative G5 was selected. As discussed in greater detail in the Decision Summary, Alternative G4 may be very difficult to implement relative to other alternatives.

Please refer to EPA's response to Comment G-..., regarding the unfounded contention that the VOC and arsenic plumes are not overlapping.

Comment S-38: *Page 17, 9th Paragraph "Alternatives G3 and G5 have minimal impacts with respect to the protection of workers, the community, and the environment during remedial construction." The installation of wells, piping, and a treatment facility will significantly impact the local community during remedial construction. For example, Alternative G5 will require extensive excavation in the area and streets, the closing of streets, interruption of utilities and noise.*

EPA response: EPA has extensive experience in the installation of wells, piping, and treatment facilities, and while there will be a period of on-site and possibly off-site construction, EPA does not believe that there will be a large impact to the local community. Alternative G5 would be much less disruptive than Alternative G4, at least as it is depicted in the FS report. See also response to comment G4L.

Comment S-39: *Page 18, 3rd Paragraph "Alternative G4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G4, relative to all other groundwater alternatives." See General Comment G-4. USEPA has overstated the uncertainties associated with this technology without basis (e.g. treatability studies) and underestimated the uncertainties of its Preferred Alternative, G5.*

EPA response: All of the alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria as required by the NCP. The evaluation presented in the FS and Proposed Plan provide the details of why groundwater Alternative G5 was selected. Please refer to the Decision Summary for an analysis of the uncertainties of both Alternatives G4 and G5.

Comment S-40: *Page 18, 6th Paragraph. USEPA has recognized the community's interest in seeing the Martin Aaron property and adjacent areas redeveloped and placed back into productive use. However, the agency's selection of groundwater alternative G5 will restrict the potential for the Martin Aaron site to be redeveloped in at least the next 10 years because:*

- *The treatment building will require at least ½ acre of space;*
- *An additional ¼ to ¾ acre will be needed for parking, material storage, equipment storage and deliveries of consumable materials;*
- *The pipelines connecting the wells to the building will be placed in trenches. As shown in the FS, absent any development plans, these pipelines will go directly from the well(s) to the building. Construction of any buildings that require a foundation of utilities will be constrained by the presence of these pipelines.*
- *Wells and pipelines will need to remain accessible for maintenance and/or replacement.*
- *The wells and treatment building will need to be placed within a security fence not only for equipment protection, but to protect the community from the operating equipment, chemicals and sludge from the precipitation process.*
- *Delivery trucks and trucks to remove the sludge from the treatment plant will need to have access at all times to the building.*

For these reasons (and others), USEPA should thoroughly examine all of the potential impediments associated with Alternative G5 and the long-term impacts on the community and the community's ability to reuse this area.

EPA response: This comment is entirely speculative with regard to the space needs of Alternative G5. See also response to comment G4L. In any case, as part of comments received during the public meeting, the community did not object to a 10-year remediation time frame for groundwater at the site, and in fact commenters were quite adamant that EPA aggressively pursue groundwater restoration at the site.

Comment S-41: *Page 18, 11th Paragraph "The Preferred Soil Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal, and is expected to allow the site to be used for its reasonably anticipated future land use, which is commercial/industrial." USEPA has not demonstrated through pilot testing or treatability testing that in-situ soil stabilization for arsenic or in-situ chemical fixation for arsenic in*

groundwater will not achieve these same objectives quicker, safer and less-costly.

EPA response: The remedial alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria required by the NCP. The evaluation presented in the FS and Proposed Plan provide the details of why soil Alternative S4 was selected.

Comment S-42: *Page 18, 11th Paragraph "Although S3 and S5 were similar in some respects, Alternative S4 was chosen because it has fewer uncertainties in addressing the Source Areas at a comparable cost." USEPA has concluded that in-situ technologies such as soil stabilization for arsenic or chemical fixation of groundwater for arsenic have an unacceptable degree of uncertainty. Traditionally, that uncertainty is addressed by the implementation of bench scale and/or pilot studies, none of which USEPA has conducted for this Site. All remedial technologies, by their very nature have some degree of uncertainty, including USEPA's selected soil excavation alternative.*

With regard to cost, Alternative S-4 is estimated to cost $6,580,000 and Alternative S-3 is estimated to cost $3,630,000. At a difference of nearly $3,000,000, it is not clear how these alternatives can be implemented at a "comparable cost". Therefore, USEPA should provide additional details as to why it has selected an alternative that apparently was rated equal to other alternatives in most respects.

EPA response: The comment gives the impression that treatability studies are routinely performed at NPL sites to test out all potential treatment technologies before remedy selection. EPA typically employs treatability studies and more comprehensive pilot studies when an innovative technology shows promise in addressing site problems but when the new technology has not been tested under similar site conditions. The technologies under discussion, solidification and geochemical fixation, have been implemented at other sites, and EPA felt that the site, which is relatively small in size and not overly complex, did not pose the types of technical challenges that might warrant treatability studies. All of the alternatives presented in the FS and Proposed Plan were evaluated against the nine criteria required by the NCP. The evaluation presented in the FS and Proposed Plan provide the details of why Alternatives S3 and G5 were selected.

Comment S-43: *Page 19, 2nd Paragraph "While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations in a relatively short time frame*

(estimated at 10 years). USEPA has not explained why the remediation of groundwater for VOCs requires "speed", especially since the groundwater is not currently being used for drinking water, is unlikely to be used for drinking water in the foreseeable future, and may likely be restricted by existing local code from use as a drinking water source. Moreover, the RI clearly concludes that natural attenuation of the VOCs in groundwater is occurring and "the progression of this degradation sequence appears relatively advanced."(RI Page 6-6).

The agency has made the assumption that extraction and treatment of groundwater for arsenic will take a relatively shorter time frame than in-situ chemical fixation. The agency has not conducted any bench scale or treatability tests to determine the effectiveness of in-situ chemical fixation at this Site. In-situ chemical fixation of arsenic in groundwater has been shown to be a relatively quick and cost-effective alternative at other sites. Furthermore, the agency cautions in the PRAP in this same paragraph that "…certain site factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination, may limit the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame."

This type of uncertainty with groundwater extraction underscores the need to fully evaluate in-situ chemical fixation, which would not require groundwater pumping and not face the risk of dewatering the aquifer. It also illustrates how the selected alternative may render the aquifer unusable (due to dewatering) in a short-time frame.

Given these apparent contradictions, USEPA must explain why more work was not performed to answer the very serious questions regarding the effectiveness of the pump and treat option.

EPA response: Please refer to EPA's Response to Comment S-10. Regardless of whether or not the groundwater is currently used as a drinking water source, EPA's expectations for groundwater contaminated by NPL sites is to return groundwater to use when practicable, consistent with 40 CFR 300.430(a)(111)(f). The FS, Proposed Plan and Decision Summary thoroughly explain EPA's goals for remediating the groundwater, and the potential difficulties that the implementation of groundwater remedies - nearly all groundwater remedies - face. Pump-and-treat remediation is the most fully developed remedial approach for addressing groundwater contamination, and it has been used successfully at hundreds of NPL and non-NPL sites. It is precisely this large reservoir of experience that allows EPA to so clearly articulate the potential

uncertainties related to this groundwater approach, and consider those uncertainties in relation to the uncertainties raised by other technologies such as geochemical fixation.

Attachment A

Superfund Program
Proposed Plan

U.S. Environmental Protection
Agency, Region II

Martin Aaron Superfund Site

July 2005

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternatives for addressing contaminated soils and groundwater at the Martin Aaron Superfund site, and provides the rationale for those preferences.

The U.S. Environmental Protection Agency's (EPA's) Preferred Alternative for soils is Alternative S4, excavation, transportation and disposal of contaminated soils containing volatile organic compounds (VOCs) and that act as a continuing source of groundwater contamination, and arsenic-contaminated soils associated with site releases. The excavated soil would be treated, if necessary, prior to land disposal. Residual soil contamination that remains on the site would be capped on site utilizing asphalt or similar material. Institutional controls such as a deed notice would be employed to ensure that future site use would not disturb the capped soils.

The Preferred Alternative for groundwater is Alternative G5, groundwater collection, on-site pretreatment, with discharge of the treated water to the publicly owned treatment works (POTW).

The Martin Aaron site was the location of a number of drum reconditioning facilities that operated out of 1542 South Broadway in Camden, New Jersey, and covers approximately 2.4 acres. The scope of EPA's investigation included that property and a number of neighboring properties, including 1535 South Broadway, which is owned by the South Jersey Port Corporation (SJPC). The SJPC property is approximately 3.6 acres in size and was included in EPA's Remedial Investigation since it was at one time leased by Martin Aaron, Inc. EPA and New Jersey Department of Environmental Protection (NJDEP) have reviewed the conditions at the SJPC property and mutually agreed to address this property separately from the Martin Aaron Superfund site. As discussed in more detail later in this Proposed Plan, NJDEP assumed the responsibility for addressing the conditions found at the SJPC property.

This Proposed Plan includes summaries of all cleanup alternatives evaluated for use at this site. This document is issued by EPA, the lead agency for site activities, and NJDEP, the support agency. EPA, in consultation with NJDEP, will select a final remedy for contaminated soils and groundwater at the site after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with NJDEP, may modify the Preferred Alternatives or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community

Dates to remember:
MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 15 - August 15, 2005
U.S. EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING:
July 26, 2005
U.S. EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at Camden County Municipal Utilities Authority Auditorium, 1645 Ferry Avenue, Camden, New Jersey at 7:00 p.m.

For more information, see the Administrative Record at the following locations:

U.S. EPA Records Center, Region II
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212) 637-3261
Hours:
Monday thru Friday - 9 am to 5 pm

Camden Free Public Library
418 Federal Street
Camden, New Jersey 08103
(856) 757-7640
Hours:
Monday thru Friday - 9 am to 5 pm

relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation and Feasibility Study (RI/FS) reports and other documents contained in the Administrative Record file for this site. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted at the site.

SITE HISTORY

Records indicate that the Martin Aaron parcel has been used for light industrial activities since at least 1886. Until at least 1940, various hide tanning, glazing, and related operations were performed on this and neighboring lots. In 1968, Martin Aaron, Inc., purchased the property, and is currently the owner of record. From 1968 to 1987, Martin Aaron operated a drum recycling business. In 1985, Westfall Ace Drum Company (WADCO), also known as Drum Services of Camden, began operating at the site. Rhodes Drums, Inc., also operated at the site from around 1985 until it ceased business in 1998. WADCO occupied the main on-site building (the Martin Aaron building), while Rhodes Drums operated from a smaller building in the southeastern corner of the property (Rhodes Drums building). WADCO was liquidated in bankruptcy proceedings in 1994.

Martin Aaron, WADCO and Rhodes Drums would arrange for removal of used drums from businesses for a fee and transport the drums to the site for reconditioning. EPA has learned that the drums contained residues of material, including hazardous substances. The drums were drained of residue, pressure-washed with a caustic solution, water-washed, rinsed, steam-dried and repainted.

In 1987, NJDEP, under a search warrant issued by the Department of Law and Public Safety, collected samples from buried drums exposed in test pits, sludge from sewer basins, soils, and effluent samples. The results confirmed the presence of hazardous waste in drums and elevated levels of metals in soil above appropriate NJDEP criteria. Sludge and effluent samples from sewer basins contained elevated VOCs and metals. Interviews with employees indicated that drum residues were allowed to drain into the ground and that drums containing wastes from the cleaning process were also buried on site. Also, NJDEP determined that a portion of the residual material generated from the drum cleaning operations drained into basins that emptied directly into the ground. Execution of the search warrant led to the indictment and conviction of one of the operators of the site, Martin Aaron, Inc. and its president, Martin Aaron, on charges of improper disposal of hazardous waste.

In 1997, NJDEP initiated an RI, using state funds, for both soil and groundwater to determine the nature and extent of contamination at the Martin Aaron site. NJDEP's investigation activities included site mapping, a geophysical investigation to identify buried drums, a stability investigation of the buildings, and extensive soil and groundwater sampling. Investigations were conducted primarily at the Martin Aaron property and at the SJPC property. Over 160 soil borings were installed to identify the areal extent of soil contamination. Sampling was conducted in and around potential contaminant source and disposal areas, and in sewer basins and other areas of potential contaminant migration. Surface and subsurface soil samples were collected inside and outside of buildings on the property, in underground storage tank (UST) areas, test pits and trench excavations. Groundwater samples were collected from monitoring wells and the nearest municipal supply well.

The NJDEP RI soil results showed that both surface and subsurface soil contamination was widespread throughout the Martin Aaron property and extend beyond property lines. Contaminants included chlorinated and aromatic VOCs, semi-volatile organic compounds (SVOCs) consisting mostly of poly-aromatic hydrocarbons (PAHs), metals, pesticides and polycyclic-chlorinated byphenyls (PCBs). The RI also found groundwater contamination in both shallow and some of the deeper monitoring wells installed on the property.

After the operators failed to respond to numerous directives issued by NJDEP to clean up the site, NJDEP conducted several interim remedial measures from 1995 to 1999. NJDEP removed soil, 700 drums of chemical wastes, 10,000 empty drums, dumpsters filled with mixed wastes, and underground storage tanks. Additionally, in 1998, the City of Camden demolished the Martin Aaron building, the main building used for drum reconditioning operations, because it was in danger of collapsing.

The site was placed on the National Priorities List in 1999, and EPA became the lead agency for the Martin Aaron site. EPA took additional removal actions, ending in 2001, to remove empty and full drums of waste that were abandoned outside the Rhodes Drums building. EPA also removed 68 drums of hazardous waste, hundreds of empty

drums, several buried drums, storage tanks, and a limited amount of contaminated soil and debris from the vicinity of the Rhodes Drums building. The property was also fenced to prevent trespassing.

ENFORCEMENT

From 1981 to 1995, NJDEP and EPA issued numerous Notices of Violations, Administrative Orders and other enforcement actions against the operators of the site. Violations included unpermitted discharges of hazardous waste, non-notification of spills or releases, improper storage of waste drums, improper waste handling and disposal, improper labeling of hazardous waste containers, hazardous waste storage violations, and others.

EPA issued letters to Martin Aaron, Inc., and Rhodes Drums in 1999 and 2000, respectively, notifying them that they were potentially responsible parties (PRPs) liable for payment of response costs for cleanup of the site. After evaluating these entities, EPA concluded that they lacked the financial resources to fund or perform the RI/FS.

In 2003 and 2004, EPA identified a number of additional companies as PRPs for the site. These companies, known as generators, were customers of the operators of the drum reconditioning facilities. Site operators would purchase empty drums from the generators, clean and recondition the drums at the site, and sell the reconditioned drums to generators and others. The drums contained residues of chemicals, including hazardous substances, which were improperly disposed of at the site. EPA has notified the generators that they are considered PRPs for the site.

SITE CHARACTERISTICS

The area surrounding the site is an urban mixture of industrial and residential uses, with some vacant lots. The Martin Aaron property is currently zoned for commercial use. The property consists of a fenced 2.4-acre parcel with one remaining building formerly occupied by Rhodes Drums. The property is covered with vegetation and the remains of the former building foundations.

There are no known drinking water or industrial production wells near the Martin Aaron site or the surrounding properties. Camden County Municipal Utilities Authority (CCMUA) provides drinking water to the City of Camden using water supply wells. CCMUA provides drinking water to approximately 105,000 people. The nearest CCMUA well is located approximately 1.75 miles east-northeast of the site. This well (City Well #7) is used as an emergency water supply well only.

Given the extensive NJDEP investigation, the scope of EPA's field investigations were meant to supplement the already available data and fill data gaps. Response actions during 1999 to 2001 were performed partly in response to NJDEP's RI results, and resulted in considerable changes in conditions at the site, with the removal of known soil hot spots, along with USTs, above-ground tanks, piping and process equipment. In addition to documenting the conditions after the removal action, EPA's study evaluated data gaps on neighboring properties, collected data that could be used for a human health risk assessment, and completed the groundwater investigation initiated by NJDEP.

EPA's RI included areas identified as the Martin Aaron property, the SJPC property, the scrap-yard (north of the Martin Aaron property), Comarco Products (a food processing facility to the south), the Ponte Equities property (unoccupied warehouse buildings, also to the south), and various properties and right-of-ways on Everett, Sixth, and Jackson Streets. (Refer to Figure 1.)

A review of property records for this section of Camden identified large tracts that required landfilling prior to development. The entire Martin Aaron study area was the subject of this type of landfilling, beginning in the 19th century. Subsequently, NJDEP and EPA site investigations identified approximately 6 to 10 feet of fill throughout the site. Studies by NJDEP have attributed elevated levels of certain groups of contaminants to this sort of "historic fill" and NJDEP has established remedial practices for addressing areas where "historic fill" is encountered. The RI sought to identify contaminants that might be attributable to "historic fill" as distinguished from contamination problems attributable to the site.

Surface Soil

Surface soil samples were collected from 60 locations including locations on the Martin Aaron and SJPC properties, the scrap-yard, Comarco Products, the Ponte Equities property, and on the Everett and Sixth Street rights-of-way. Laboratory results were compared to site-specific screening levels for a wide range of contaminants.

VOC contamination above screening levels was detected in the surface soil within the limits of the Martin Aaron property, but on no other properties investigated (refer to

Figure 2). The most frequently detected VOCs were tetrachloroethylene (PCE), trichloroethylene (TCE), and cis-1,2-dichloroethylene (cis-1,2-DCE), though a variety of different solvents were detected. This pattern is consistent with a drum reconditioning facility that would have handled liquids from a variety of unrelated operations.

SVOCs were detected at 58 of 60 surface soil sampling locations, across the entire study area. With few exceptions, the SVOCs identified in surface soils were poly-aromatic hydrocarbons (PAHs), which are frequently detected in urban soils. PAHs were generally higher on the Martin Aaron property than on other properties, with the highest concentrations in the former process and drum storage areas of the Martin Aaron operation. The earlier tannery operations would have used coal for heating and drying hides, and these same areas of the Martin Aaron property also coincide with former coal storage areas from this earlier operation. The presence of PAHs in surface soil outside of operational areas at the site appears to be associated with "historic fill" at these properties.

Metals above screening levels were detected in virtually all of the surface soil samples collected. Arsenic, barium, and lead were detected most frequently. It is likely that metals exist at elevated levels due to the presence of "historic fill" material at the site and surrounding properties. Industrial operations on neighboring properties probably also played a factor: a glass-making company, a possible source of barium, operated on the scrap-yard property; and a lead smelter operated across Sixth Street from the site. Higher concentrations of metals, particularly arsenic, were found in suspected source areas at the Martin Aaron property, which suggests that there may also be a site-related contribution of metals. Arsenic may be attributable to the drum reconditioning operations, but is also typically a remnant of tannery operations.

Pesticides were infrequently detected in the study area. PCBs were detected above screening levels in only four surface soil samples ranging from 2 to 19 parts per million (ppm).

Subsurface Soils

Subsurface soil samples were collected at 72 sampling intervals at depths ranging from greater than two feet below ground surface (bgs) to approximately 21 feet bgs.

For subsurface soil, VOCs were detected almost exclusively on the Martin Aaron property (refer to Figure 2). Similar to the surface soil, 14 different VOCs were detected in subsurface soil, though few with any frequency (PCE was the most frequently detected). For example, PCE (with a screening level of 0.06 ppm) was detected with a hot spot level of 110 ppm near a location where the former Martin Aaron building existed. At a different location near the middle of the Martin Aaron property, TCE (with a screening level of 0.06 ppm) was found at 630 ppm, and PCE was not detected. These hot spots were found at between four and seven feet bgs. The results suggest that drum reconditioning operations contributed to VOC contamination in subsurface soil at different locations on the property.

SVOCs were identified above screening levels at the Martin Aaron property, in the rights-of-way on Everett Street and Sixth Street, and on the SJPC property. As with the surface soils, the SVOCs detected most frequently in subsurface soil were PAHs that have also been associated with "historic fill." There is some correlation between SVOC concentrations and, for instance, the Martin Aaron building hot spot VOC area on the Martin Aaron property. Elevated SVOCs were identified in the northeastern corner of the SJPC property. It is suspected that a former service station north of the SJPC property may have contributed to the SVOC contamination at this location. The results suggest that SVOCs migrated to subsurface soils as a result of operations at the Martin Aaron site and, possibly, from other sources, as well as contributions from the presence of fill material at these properties.

Metals were found on all properties sampled and at most sampling locations. Metals above screening levels include: antimony, arsenic, barium, cadmium, chromium, lead, mercury, selenium and thallium. The metals appear to be attributable to "historic fill" material or from other sources at these sampling locations, with the exception of arsenic, which appears at concentrations as high as 23,300 ppm at the Martin Aaron building hot spot. By contrast, several of the highest concentrations of lead, the most frequently detected metal, were found across Sixth Street in the right-of-way, in front of the former smelting facility.

Pesticides were infrequently detected in subsurface soil and pesticide concentrations were relatively low (i.e dieldrin was detected in the range of 0.006 to 0.69 ppm). PCBs were also infrequently detected above screening levels. PCBs had been detected with more frequency in NJDEP's RI, but it appears that the 1999-2000 removal actions substantially addressed site PCBs.

The Rhodes Drum Building

The one building still standing on the Martin Aaron property, referred to as the Rhodes Drums building, is actually part of a larger one-storey structure that is primarily situated on the neighboring Ponte Equities property. This one-storey building, along with another much taller building on the Ponte Equities property, are currently unoccupied. Rhodes Drums apparently used only the smaller section situated on the Martin Aaron property for its drum recycling operations. The original one-storey building (on both lots) was probably built by the Castle Kid Company as part of is tanning operations in the early 1900s. Since that time, the buildings on the Ponte Equities property are known to have been used as a book bindery and as a warehouse.

A safety inspection determined that it would be unsafe to perform sampling activities inside the Rhodes Drums building. Soil sampling adjacent to the Rhodes Drums building suggest that there is contamination underneath the building, and NJDEP's earlier investigation of the Rhodes Drums building confirms soil contamination in excess of NJDEP soil cleanup criteria. The soil contamination found included VOCs, PAHs, metals, and pesticides/PCBs.

No sampling was performed in the two structures on the Ponte Equities property as part of the RI. Additional investigations will be necessary to determine if tanning operations resulted in contamination of the one-storey Ponte Equities building.

Groundwater

In order to evaluate hydrogeologic conditions and groundwater quality beneath the site, a total of 24 monitoring wells were installed as part of EPA's RI. An additional 10 wells from the NJDEP RI were also sampled. Two rounds of groundwater sampling were conducted in June and September of 2002. In addition, a CCMUA emergency water supply well (City Well #7) was also sampled.

The groundwater table is generally found about four to seven feet bgs. Below the fill at the site, the hydrogeology is made up of several layers of the Potomac-Magothy-Raritan (PRM) aquifer, which is composed of layers of gravel, sand, silt and clay. The Upper and Middle PRM aquifers were investigated as part of this study. A number of the monitoring wells were placed at or near the water table, within the first 20 feet bgs, and are considered "shallow" wells. Site monitoring wells were also placed within the first 100 feet bgs, or within the Upper PRM Aquifer. The Upper PRM Aquifer is a sand and gravel layer that is separated from deeper units by less conductive clay/silt lenses. A few monitoring wells were also installed to approximately 180 feet bgs, in the Middle PRM Aquifer. Groundwater at the site generally moves to the southeast, influenced by municipal pumping wells.

Groundwater samples were analyzed for VOCs, SVOCs, metals, and PCBs (refer to Figure 3). VOC contamination in the "shallow" wells is primarily limited to within the Martin Aaron property boundary. As with VOC-contaminated soils, 12 different VOCs were detected, led by cis-1,2-DCE, benzene, TCE and PCE. Of the highest concentrations detected, cis-1,2-DCE was found as high as 330 parts per billion (330 ppb) and benzene as high as 31 ppb. While many metals were detected above screening levels in the "shallow" wells, only arsenic, detected as high as 3,700 ppb, appears to be site-related.

In the Upper PRM Aquifer wells, which were screened between 30 and 60 feet bgs, VOCs detected above screening levels include cis-1,2-DCE, TCE, vinyl chloride, dichloropropane, and benzene. VOCs were primarily identified in groundwater samples collected from the Martin Aaron property, with a trend of groundwater contamination moving to the southeast, consistent with the direction of groundwater flow. Groundwater in the area of the Martin Aaron building hot spot were elevated but substantially lower (cis-1,2-DCE at 37 ppb) at this depth. Arsenic was also found at this depth, though at substantially lower concentrations than in the shallow wells.

In wells from deeper units (deeper than 100 feet bgs), the VOCs, TCE and vinyl chloride, were detected at 1.1 ppb and 6.1 ppb, respectively, which are considered relatively low concentrations. City Well #7, which is screened at 123 feet bgs, is not affected by site contamination.

Based on groundwater data collected from the RI, a VOC plume, comprised of cis-1,2-DCE, TCE, PCE and several other constituents, has been determined to be over 1,000 feet long and approximately 600 feet wide in the shallow wells (within the first 20 feet bgs). The plume narrows with depth to approximately 400 feet wide in Upper PRM Aquifer wells at depths of 30 to 60 feet bgs. Vertically, the deepest contamination was found within a confining unit at the base of the Upper PRM Aquifer (approx. 110 feet bgs). The confining unit consists of thin sand and clay layers, and wells installed in these sand layers exhibited the deepest, albeit relatively low VOC

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element. In addition, NJDEP has recommended that soils contaminated with VOCs in excess of 1 ppm may also be a source of groundwater contamination, and soils in excess of that criterion are also considered principal threat waste.

concentrations.

A smaller arsenic groundwater plume exists in the shallow aquifer, with arsenic concentrations decreasing with depth.

SCOPE AND ROLE OF THE ACTION

This action, referred to as Operable Unit 1 (OU1), will be the only action for the site, addressing both contaminated soil and groundwater. EPA's findings indicate the presence of "principal threat" wastes at the site, primarily on the Martin Aaron property.

Concurrent with EPA's RI/FS, NJDEP and the SJPC property owner evaluated potential remedies for the SJPC property. After evaluating previous site uses and the EPA/NJDEP sampling results, NJDEP concluded that the contamination at the SJPC property could be attributed to "historic fill" in the area, and not to the Martin Aaron site. For example, Martin Aaron, Inc. only leased part of the SJPC property for drum storage, and sample results in areas used by the Martin Aaron operation had similar results when compared to areas not used by Martin Aaron. NJDEP also concluded that the contamination on the SJPC property, primarily metals and PAHs, did not appear to be a source to the groundwater contamination in the area.

Given these conditions, NJDEP, with EPA's concurrence, plans to proceed with a remedy for the SJPC property, independent of the Martin Aaron site. NJDEP's Technical Regulations require that if "historic fill" material is not treated or removed from a site, engineering and institutional controls shall be implemented. An engineering control (capping) would be required at the SJPC property prior to reuse, along with a deed notice to assure the long-term maintenance of the cap.

This Proposed Plan addresses the contaminated soils and groundwater for the Martin Aaron site and adjacent properties, not including the SJPC property.

EPA's findings indicate the presence of "principal threat" wastes at Martin Aaron, which are also addressed by this Proposed Plan, in the form of VOC and arsenic hot spots at several areas that lie primarily on the Martin Aaron property.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants in soils and groundwater on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance release from a site in the absence of any actions or controls to mitigate these under current and future land uses. The Martin Aaron site is bounded by residential and commercial properties. Martin Aaron is currently zoned for commercial/industrial use. According to the City of Camden, it is anticipated that the future land use for the Martin Aaron site will be commercial/industrial.

Human Health Risks

The human health risk assessment evaluated exposure to surface and subsurface soils at the Martin Aaron property, the scrap-yard, and the properties adjacent to the facility under several exposure scenarios, including current trespasser exposure to surface soils, future exposure to surface and subsurface soils by commercial/industrial workers and construction workers, as well as future use of groundwater as a potable water supply. It should also be noted that the human health risk assessment evaluated potential risks under a future residential scenario through exposure to contamination in the soils and groundwater; however, it is currently anticipated that future land use for the site will not include residential development.

At the Martin Aaron property, direct contact exposure to soils is associated with excess lifetime cancer risks levels

of 2.3 x 10^{-4}, 1.6 x 10^{-3}, and 1.9 x 10^{-4} for the trespasser, the commercial/industrial worker, and the construction worker, respectively, with benzo[a]pyrene and arsenic as the primary contributors to the risk. The non-cancer hazard indices exceed EPA's benchmark of 1 for the trespasser (3.9), commercial/industrial worker (11.9), and the construction worker (8.6) with arsenic, mercury and PCBs contributing most significantly.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of concern at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects

In the scrap-yard area, an excess lifetime cancer risk of 8.2 x 10^{-4} and a hazard index of 6.3 are estimated for the commercial/industrial worker in direct contact with soils. For both estimates, arsenic is the largest contributor to the risk and hazard. Risks and hazards to other populations evaluated are within acceptable limits.

Exposure to the commercial/industrial worker to the contaminants in soils at the properties adjacent to the site is associated with an excess lifetime cancer risk of 6.8 x 10^{-4} and a non-cancer hazard index of 5.6, with arsenic as the most significant contributor to the risk. Risks and hazards to other populations evaluated are within acceptable limits.

Exposure to groundwater as a drinking water supply in both the Upper PRM and the Middle PRM aquifers was also evaluated in the human health risk assessment. The evaluation of the Upper PRM indicates excess lifetime cancer risks of 1.9 x 10^{-2} for the commercial/industrial worker and a non-cancer hazard index of 130; the most significant contributors to these risks are arsenic and vinyl chloride. The Middle PRM was also evaluated and the non-cancer hazard index was found to be 7, with arsenic as the largest contributor; the excess lifetime cancer risk was within acceptable limits.

These risks and hazard levels indicate that there is significant potential risk to workers and trespassers from direct exposure to contaminated soil and groundwater. The risk estimates are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the soil and groundwater, as well as the toxicity of the chemicals of concern, including arsenic, benzo[a]pyrene, and vinyl chloride.

Ecological Risks

The screening-level ecological risk assessment (SLERA) results indicate potential risks to terrestrial plants, terrestrial wildlife, and soil invertebrates from direct exposure to PAHs, inorganic chemicals, several pesticides, PCBs, SVOCs and VOCs in the site soils. A groundwater evaluation indicated very little potential to adversely affect aquatic life due to the limited possibilities of groundwater reaching the surface. No further consideration of groundwater was warranted in the Ecological Risk Assessment.

Further consideration of the potential ecological risks may be warranted; however, the habitats at the site have been highly disturbed and the area provides only very limited viable habitat for ecological receptors.

It is EPA's current judgment that the Preferred Alternatives identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, are necessary to protect human health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives for contaminated soil and groundwater address the human health risks and environmental concerns at the Martin Aaron site.

Remedial Action Objectives for Soil

The remedial action objectives for soil are to:

- Reduce or eliminate the direct contact threat associated with contaminated soil to levels protective of a commercial or industrial use, and protective of the environment;
- Prevent erosion and off-site transport of contaminated soils; and
- Reduce or eliminate the migration of site contaminants from soil to groundwater.

This proposed action would reduce the direct contact excess cancer risk associated with exposure to contaminated soils to one in one million for commercial/industrial use of the site. This will be achieved by reducing exposure to the concentrations of the soil contaminants to the target levels indicated in Table 1 in surface soil (soil within the first two feet of ground surface). Because there are no promulgated Federal or State cleanup standards for soil contamination, EPA established these targets, or Cleanup Goals, based upon the baseline risk assessment. Targets were selected that would both reduce risk associated with exposure to soil contaminants to an acceptable level and ensure minimal migration of contaminants off the site.

With regard to arsenic, EPA evaluated the level of arsenic contamination that is more likely to be attributable to "historic fill," which was found at a range of less than 20 ppm to 339 ppm on and off the site, and concluded that soils contaminated with arsenic at concentrations greater than 300 ppm are probably associated with both the tannery and the drum reconditioning operations at the Martin Aaron property, and concentrations less than 300 ppm are more typical of "historic fill". An arsenic groundwater plume is also centered on the Martin Aaron property, and the high arsenic contamination levels in soils are probably exacerbating these conditions. Table 1 identifies 20 ppm as a direct-contact Cleanup Goal for arsenic, but this action identifies arsenic hot spots on Martin Aaron at concentrations greater than 300 ppm, and requires more rigorous remedies for arsenic associated with site releases.

Because some deeper soils, down to an estimated 10 feet below ground surface, are contaminated with VOCs at levels that act as continuing sources of groundwater contamination, this proposed action would reduce this threat by remediating contaminated soils in excess of 1 ppm total VOCs. In addition, the presence of VOCs in soil is closely linked to Martin Aaron site activities.

Based upon communications with the City and other interested parties, including supporters of the Waterfront South redevelopment project, reuse expectations for the Martin Aaron property and neighboring properties are for commercial redevelopment. Of the adjacent properties, only Comarco Products is currently in active use.

As with NJDEP's evaluation of the SJPC property, EPA's investigation identified contamination in a number of areas nearby the Martin Aaron property that is consistent with "historic fill" and does not appear to be the result of contaminant releases from the Superfund site. These areas include the rights-of-way on Everett and Sixth Streets, and most of Comarco Products and the Ponte property. Soil contamination on the Martin Aaron property, the scrap-yard, and on portions of Comarco Products and the Ponte property appear to be attributable to the Martin Aaron Superfund site.

EPA has developed direct-contact Cleanup Goals that are appropriate for the Martin Aaron site that would be protective under a future-use commercial redevelopment scenario. The direct-contact Cleanup Goals, identified in Table 1, are similar to with New Jersey Soil Cleanup Criteria for Non-Residential Direct Contact. These direct-contact Cleanup Goals would also be protective for commercial redevelopment of other neighboring properties; however, they would not be appropriate for an unrestricted future residential use of remediated properties.

Remedial Action Objectives for Groundwater

The remedial action objectives for groundwater are to:

- Prevent public exposure to contaminated groundwater that presents a significant risk to public health and the environment;
- Remediate groundwater to the extent practicable and minimize further migration of contaminants in groundwater; and
- Restore the groundwater to drinking water standards within a reasonable time frame.

There are currently no complete exposure pathways to contaminated groundwater beneath the Martin Aaron site because there are no known contaminated wells in use. All residents in the area of the Martin Aaron site are currently on city-supplied water. If contaminated groundwater is used as drinking water in the future, significant health risks would exist. In addition, if the contaminated groundwater were used in industrial processes within the area, significant human health risks may exist. Finally, vapor intrusion into new or existing structures is a potential exposure pathway from VOCs in groundwater. Thus, remedial actions must minimize the potential for human exposure to contaminated groundwater.

Groundwater within the source area must be remediated to the extent practicable. The presence of clay and silt stringers within the uppermost water bearing zone and high contaminant concentrations in groundwater (specifically of arsenic), make it difficult to restore groundwater to the MCLs or the New Jersey groundwater quality concentrations (GWQCs) in the foreseeable future, even with active remediation of groundwater. Further migration of contaminants to groundwater outside the source areas should be minimized to allow remediation of groundwater in a reasonable time frame.

Table 2 lists the contaminants of concern found in groundwater at the site, and their respective Cleanup Goals, in this case the drinking water standards (MCLs) or GWQCs. Cleanup Goals were selected that would both reduce the risk associated with exposure to contaminants to an acceptable level and ensure minimal migration of contaminants off the site.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial Alternatives for both soils and groundwater are presented below. CERCLA requires that if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, EPA must review the action no less often than every five years after initiation of the action. In addition, institutional controls in the form of a deed notice to limit the use of portions of the property may be required. The type of restriction and enforceability may need to be determined after completion of the remedial alternative selected in the ROD. Consistent with expectations set out in the Superfund regulations, none of the remedies rely exclusively on institutional controls to achieve protectiveness. The time frames below for construction do not include the time for remedial design or the time to procure contracts.

Common Elements: Soil Alternatives

Several of the soil alternatives include common components. Alternatives S2 through S6 include the demolition of at least the Rhodes Drums building (the section on the Martin Aaron property). Demolition of this building is assumed because it is likely that site contamination is under the building, and because its poor structural condition could limit the ability to safely remediate other areas of the site. Less is known about the adjoining one-storey Ponte Equities building, which may also reside on top of site contamination from its years as part of tannery operations.

The active remedies address surface soil contamination through capping (Alternatives S2 through S5) or excavation and off-site disposal (Alternative S6). Alternatives S3 through S6 address principal threat waste, VOC- and arsenic-contaminated soil that are a source of groundwater contamination, through a combination of different treatment technologies or excavation and off-site disposal. Alternative S2 only passively addresses principal threats through capping, and would need to be coupled with an active groundwater remedy to satisfy the remedial action objectives.

Since each alternative would result in soil contamination remaining on-site at levels that would not allow for unrestricted use, institutional controls would be employed to ensure that future site activities be performed with knowledge of the site conditions, that appropriate health and safety controls would be in place, and, that unrestricted use of the property would not be allowed.

SOIL ALTERNATIVES

Alternative S1: No Action

Estimated Capital Cost: *$0*
Estimated Annual O&M Cost: *$0*
Estimated Present Worth Cost: *$0*
Estimated Construction Time frame: None

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action at Martin Aaron or the surrounding properties to prevent exposure to the soil contamination and the contaminated soil would be left in place. Existing temporary measures (i.e., limited access through fencing) would provide limited protectiveness, but they would not be monitored or maintained.

Redevelopment of Martin Aaron would pose a high risk of direct contact exposure to construction workers and future users, and may exacerbate off-site contaminant migration.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative S2: Capping and Institutional Controls

Estimated Capital Cost: *$2,970,000*
Estimated Annual O&M Cost: *$18,500*
Estimated Present Worth Cost: *$3,310,000*
Estimated Construction Time frame: 2 months

Under this alternative, the areas of contaminated soil exceeding the direct-contact Cleanup Goals would be capped to prevent direct contact with the soil contamination. Capping would limit groundwater infiltration through the source areas, reducing the rate of contaminant migration out of the VOC and arsenic hot spots. Asphalt capping has been specified, for cost-estimation purposes, though a redevelopment plan including a combination of building foundations and other ground covers could be designed that would be protective.

Demolition of the existing Rhodes Drums building at the site would be conducted since soil contamination extends up to the building walls and may extend beneath the building.

Institutional controls would consist of land use restrictions that would prevent disturbance of and assure the maintenance of the cap. A deed notice prepared in accordance with the NJDEP Technical Requirements for Site Remediation would need to be placed on the affected properties identifying the areas of soil with contamination, and the areas with site-specific engineering controls. As part of redevelopment plans, properties would also have a requirement for VOC vapor controls for newly constructed buildings.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative S3: Solidification of Arsenic Source Areas, Soil Vapor Extraction of VOC Source Areas, and Capping

Estimated Capital Cost: *$3,240,000*
Estimated Annual O & M Cost (0-2 yrs): $125,900
Estimated Annual O & M Cost (3-50 yrs): $8,800
Estimated Present Worth Cost: *$3,630,000*
Estimated Construction Time frame: *2.5 years*
Estimated O & M Time frame for SVE: *2 years*

This alternative consists of a combination of treatment technologies to address the Source Areas, coupled with capping. To address the VOC-contaminated soil, this alternative includes installation of a soil vapor extraction (SVE) system. In addition, this alternative calls for the stabilization of soil with concentrations of arsenic over 300 ppm, through the addition of a concrete mixture into the soil.

The volume of soil containing VOCs to be treated with SVE is estimated at 12,150 cubic yards and the volume of soil containing arsenic to be stabilized is approximately 16,000 cubic yards; however, in some cases, the VOC Source Areas and the Arsenic Source Areas overlap on the site. While stabilization has been marginally successful in treating VOC-contaminated soil at some sites, SVE cannot be used to treat arsenic contamination. In addition, stabilization can be performed in one construction step, whereas SVE involves the installation and operation of an in-ground system over a number of months or years. Under this alternative, stabilization would be performed first, including in areas where arsenic and VOCs are co-located, followed by SVE in remaining areas with only VOC contamination. The O&M time frame estimated (above) is for the expected operation period of the SVE system.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils, including the treated soils, similar to Alternative S2. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap and to prevent disturbance of the stabilized soil.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative S4: Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils

Estimated Capital Cost: *$6,400,000*
Estimated Annual O & M Cost (30 years): *$8,800*
Estimated Present Worth Cost: *$6,580,000*
Estimated Construction Time frame: *5 months*

This alternative includes excavation of approximately 28,000 cubic yards of both the VOC and arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary to allow for land disposal. The unexcavated portions of the Martin Aaron site, an area of approximately 2.0 acres where soils exceed the direct-contact Cleanup Goals, would be capped as presented in Alternatives S2 and S3. This alternative meets the remedial objectives by removing highly contaminated soils that are continuing to leach VOCs and arsenic to groundwater and eliminates contact with the remaining soil contamination by capping. Off-site treatment of the excavated soil may be needed prior to disposal if the soil exhibits hazardous characteristics as defined by the Resource, Conservation and Recovery Act (RCRA) and, therefore, treatment would be required to meet the RCRA Land Disposal Requirements (LDRs). For cost estimating purposes, the FS assumed 30 percent of the excavated soil would undergo treatment prior to disposal.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils, including the treated soils, similar to Alternative S2. Excavated areas would be backfilled with clean fill. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative S5: Excavation and Off-site Transportation of Arsenic Source Areas with Treatment as necessary prior to Land Disposal, Treatment of VOC Source Areas via Soil Vapor Extraction, Capping Residual Soils

Estimated Capital Cost: *$5,800,000*
Estimated Annual O & M Cost (0-2 yrs): $125,900
Estimated Annual O & M Cost (3-50 yrs): $8,800
Estimated Present Worth Cost: *$6,190,000*
Estimated Construction Time frame: 2.5 years
Estimated O & M Time frame for SVE: 2 years

This alternative includes excavation of the arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary to allow for land disposal. Treatment of the soil prior to disposal may be needed if required by the RCRA LDRs. In addition, the VOC Source Areas would be addressed through the installation of an SVE system, as described in Alternative S3. The O&M time frame estimated (above) is for the expected operation period of the SVE system.

This alternative also includes the demolition of the Rhodes Drums building and capping of residual soils that exceed the direct-contact Cleanup Goals, similar to Alternative S2. Excavated areas would be backfilled with clean fill. Institutional controls, similar to those described in Alternative S2, would be required to assure the protectiveness of the cap.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative S6: Excavation and Off-site Transportation of Residual Soils and Source Areas with Treatment as necessary prior to Land Disposal, Engineering Controls

Estimated Capital Cost: *$ 8,300,000*
Estimated Annual O & M Cost: *$0*
Estimated Present Worth Cost: *$8,300,000*
Estimated Construction Time frame: 4 years

Alternative S6 would result in the excavation of all soils within the Source Areas and all soils exceeding the direct-contact Cleanup Goals. The depth of excavation varies from two feet to a maximum depth of about 10 feet. The

SUMMARY OF REMEDIAL ALTERNATIVES MARTIN AARON SITE		
Medium	FS Designation	Description
SOIL	Alternative 1 (S1)	No action
	Alternative 2 (S2)	Capping and Institutional Controls
	Alternative 3 (S3)	Solidification of Arsenic Source Areas, Soil Vapor Extraction (SVE) of VOC Source Areas, and Capping
	Alternative 4 (S4)	Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils
	Alternative 5 (S5)	Excavation and Off-site Transportation of Arsenic Source Areas with Treatment as necessary prior to Land Disposal, Treatment of VOC Source Areas via Soil Vapor Extraction, Capping Residual Soils
	Alternative 6 (S6)	Excavation and Off-site Transportation of Residual Soils and Source Areas with Treatment as necessary prior to Land Disposal, Engineering Controls
GROUNDWATER	Alternative 1 (G1)	No action
	Alternative 2 (G2)	Monitored Natural Attenuation (MNA) and Institutional Controls
	Alternative 3 (G3)	Containment with Hydraulic Controls
	Alternative 4 (G4)	Geochemical Fixation and MNA
	Alternative 5 (G5)	Groundwater Collection and Treatment

area of excavation would encompass a majority of the Martin Aaron property and on surrounding properties, resulting in excavation of approximately 64,500 cubic yards. Similar to Alternative S4, Source Area soils would be treated, as necessary, prior to land disposal to satisfy the RCRA LDRs.

This alternative also includes the demolition of the Rhodes Drums building. Because the site Cleanup Goals are protective for a commercial end-use, but not for unrestricted use, this alternative would not allow for unrestricted future use in some portions of the site. In that case, institutional controls similar to those described in Alternative S2 would be needed to assure the protectiveness of the remedy.

Similar to Alternatives S2 and S3, this alternative may result in soil contamination remaining on site at levels that would not allow for unrestricted use. Therefore, a review of the site at least every 5 years would be required, unless determined otherwise.

Common Elements: Groundwater Alternatives

Performance of the four active groundwater remedial alternatives would be greatly enhanced by an active soil remedy to address the soil Source Areas, which would substantially reduce both the volume of principal threat wastes at the site and groundwater contaminant contribution. None of the groundwater alternatives would fully remediate the groundwater without an active soil remedy.

All active groundwater alternatives require a long-term monitoring program to assess effectiveness and to monitor the migration of contamination over time. While the zone of contaminated groundwater is not currently in use, and no water supplies are threatened, the active remedies (Alternatives GW2 through GW5) would require institutional controls such as a Classification Exception Area (CEA) to restrict use of the groundwater until remediation goals are achieved.

GROUNDWATER ALTERNATIVES

Alternative G1: No Action

Estimated Capital Cost: *$0*
Estimated Annual O&M Cost: *$0*
Estimated Present Worth Cost: *$0*
Estimated Construction Time frame: None

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to prevent exposure to the groundwater contamination. Institutional controls would not be implemented to restrict future groundwater use.

If no soil or groundwater action is taken, groundwater contamination will persist above the remediation goals, and the plume may expand over time. If an active soil remedy addresses the source areas, but no groundwater action is taken, VOC and arsenic plumes would still persist for a number of years (roughly estimated over 50 years).

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative G2: Monitored Natural Attenuation (MNA) and Institutional Controls

Estimated Capital Cost: *$23,925*
Estimated Annual O & M Cost (0-2 yrs): $207,418
Estimated Annual O & M Cost (3-50 yrs): $25,927
Estimated Present Worth Cost: *$550,000*
Estimated Construction Time frame: *0 years*

Alternative G2 relies on natural attenuation to address the groundwater plume while placing use restrictions on the area of groundwater exceeding the Cleanup Goals until groundwater returns naturally to acceptable levels. Alternative G2 relies on remediation of the soil Source Areas (through the selection of an active soil remedy) and cannot satisfy the remedial action objectives alone.

Studies performed during the RI indicate that natural attenuation of VOCs is probably underway. Natural attenuation is the process by which contaminant concentrations are reduced by conditions already present in the groundwater, such as volatilization, dispersion, adsorption, and biodegradation. VOC contamination is amenable to natural attenuation under certain conditions, some of which appear to exist at the site. These natural degradation processes may decrease VOC contaminant concentrations over time, especially if an active soil remedy is undertaken to address VOC source areas. The prospects for natural mechanisms to decrease the concentration or mobility of arsenic in groundwater are very limited, though a soil remedy addressing arsenic source areas would improve groundwater conditions.

Under this alternative, a soil remedial alternative that either treats or removes the soil Source Areas would minimize further contaminant contribution to the plume, thus substantially decreasing the time until natural attenuation achieves the remedial goals. The main remedial components of this alternative include groundwater use restrictions and monitoring.

Institutional controls, such as a CEA, would be implemented. The components of the CEA include the location of the restriction (including areas of potential migration before degradation reduces contaminant concentrations to below applicable cleanup criteria), the compounds detected over the applicable cleanup criteria, and the proposed duration of the restriction. This control would restrict future use of the groundwater within the area over the duration of the CEA.

Alternative G2 would require a monitoring program, which would establish a set of groundwater conditions that would be expected to be met over time, if natural attenuation is succeeding. If monitoring of the groundwater contamination indicates that natural attenuation would not achieve the remediation goals, active restoration with one of the other alternatives G3, G4, or G5 presented later, would be implemented.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative G3: Containment with Hydraulic Controls

Estimated Capital Cost: *$1,600,000*
Estimated Annual O&M Cost: *$580,000*
Estimated Present Worth Cost: *$7,800,000*
Estimated Construction Time frame: 3 months

The objective of Alternative G3 is to intercept the contaminated groundwater using a series of extraction wells along the downgrading edge of the contamination to control the off-site migration of the plumes. This alternative would meet the remedial objectives by preventing downgradient migration of the plume and protection of any receptors, and eventual capture of the plume.

The alternative would consist of extraction wells, pretreatment of arsenic and VOC contamination, and discharge to the POTW (i.e., the Camden County Municipal Utilities Authority (CCMUA)). The groundwater use restrictions are the same as described for Alternative G2, and a monitoring program would also be required.

While the lateral extent of the contamination extends to approximately 125 feet bgs, the bulk of the contamination is within 50 feet of the ground surface. Active pumping to a depth of approximately 50 feet is expected to contain the portion of the plume that has the highest potential to migrate. For cost estimation purposes, the FS assumed

that three extraction wells along the downgrading edge of the plume, pumping at a combined 20 gallons per minute (20 gpm), would contain the plume. Because the arsenic and VOC plumes migrate at different rates, additional extraction wells could be installed within the arsenic plume to also control the migration of the arsenic plume.

If coupled with an active source control remedy for the soils, preliminary calculations estimate a time frame of 20 years to completely remediate the aquifer.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative G4: Geochemical Fixation and MNA

Estimated Capital Cost:	*$1,200,000*
Estimated Annual O&M Cost:	*$26,000*
Estimated Present Worth Cost:	*$1,700,000*
Estimated Construction Time frame:	*6 months*

Alternative G4 includes geochemical fixation to address the arsenic-contaminated groundwater, along with MNA (similar to Alternative G2) to address the VOCs. Geochemical fixation involves introducing a polymer into an area with high arsenic concentrations. This particular process entails the mechanical mixing of an estimated 64,000 cubic yards of soil over the course of a number of months. The chemical process transforms metal contaminants to low-solubility precipitates. The conversion of contaminants to low-solubility precipitates eliminates their mobility and prevents them from being drawn into water wells if any wells were installed at the site in the future. At Martin Aaron, polymers would be introduced to a depth of approximately 15 to 20 feet. This depth includes the shallow aquifer and an underlying clay layer where the arsenic concentrations appear to be highest. A pilot study to evaluate methods of distributing chemicals and the resulting effectiveness would be required prior to full scale injection.

The groundwater use restrictions and MNA are as described for Alternatives G2 and G3. This alternative would also include long-term monitoring to assess the effectiveness of the remedy. If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative G5: Groundwater Collection and Treatment

Estimated Capital Cost:	*$1,700,000*
Estimated Annual O&M Cost:	*$700,000*
Estimated Present Worth Cost:	*$6,600,000*
Estimated Construction Time frame:	*3 months*

The objective of Alternative G5 is to aggressively remediate the contaminated groundwater plume by extraction and treatment of all of the contaminated groundwater, with discharge of the treated water to the CCMUA. The groundwater extraction and treatment system would consist of extraction wells, on-site pretreatment (assumed, for cost-estimating purposes, to be a combination of air-stripping and vapor-phase carbon to address the VOCs and chemical precipitation to address metals), and discharge to the POTW. The extraction wells would be placed in the contaminated portions of the plume to depths of approximately 50 feet, pumping at a rate of 85 gpm. In order to determine if chemical precipitation would be necessary, contaminant concentrations were estimated for the collection system discharge and compared against the CCMUA pretreatment limits. Arsenic was the only groundwater contaminant that may exceed the limits. Based on this evaluation, arsenic removal with chemical pretreatment would be needed prior to discharge to CCMUA. The groundwater use restrictions and monitoring of groundwater are as previously described in Alternative G2.

If combined with an active soil remedy to address the Source Areas, it has been estimated that this system would be operated for 10 years to restore the aquifer.

Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select an alternative. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS.

1. **Overall Protection of Human Health and the Environment**

Soils

The no further action alternative is not protective because it does not prevent direct contact with site soils and allows continued leaching of VOCs and metals to groundwater.

Alternatives S2 through S6 are all considered protective of human health because they all prevent direct contact with contaminated soils in excess of the direct contact Cleanup Goals. Because the direct-contact Cleanup Goals are appropriate for commercial or industrial uses, but not for unrestricted use, the implementation of institutional controls such as a deed notice would be required for any of the active remedies to assure protectiveness over the long term. Alternative S2 relies primarily on capping and institutional controls to meet the remedial action objectives, and does little on its own to address the arsenic and VOC hot spots.

Groundwater

The no further action alternative is not considered protective because it does nothing to prevent exposure to contaminated groundwater in the future, which would result in unacceptable future risks.

The remaining alternatives are considered protective. Alternative G2 (MNA and Institutional Controls) is considered protective because it includes restrictions on the use of groundwater and includes groundwater monitoring to evaluate natural attenuation and ensure that the plume does not migrate to areas that would result in human exposure. Alternative G2 eliminates human contact. Alternatives G3 through G5 also meet the threshold of preventing human exposure. Alternatives G3, G4, and G5 take differing approaches to controlling or remediating the groundwater contamination; however, none of these alternatives are expected to remediate the groundwater without the aid of a complimentary soil remedy that addresses the soil Source Areas.

2. **Compliance with ARARs**

Soils

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements (ARARs) of federal and state law or provide grounds for invoking a waiver of those requirements. There are no chemical-specific ARARs for the contaminated soil. The Cleanup Goals are risk-based for the surface soils, and are similar to NJDEP's non-residential direct contact soil criteria. In addition, NJDEP has developed Impact to Groundwater Soil Cleanup Criteria to address sources of groundwater contamination in deeper soils, and EPA considered these criteria in developing the Source Area Cleanup Goals for this site. Alternative S2 relies on capping to address the direct contact Cleanup Goals, and Alternative S6 relies on excavation. Alternatives S3, S4, and S5 rely primarily on capping to achieve the direct contact Cleanup Goals.

Alternative S2 does little to meet the source control Cleanup Goals, besides some reduction in surface water infiltration that would reduce contaminant mobilization. Alternative S2 paired with groundwater Alternative G3 (Containment and Hydraulic Controls) could achieve the source control Cleanup Goals in soils through a containment strategy. Alternatives S3 through S4 would satisfy the source control Cleanup Goals through various combinations of excavation and treatment.

Based upon the available documentation regarding the site, EPA has concluded that the soil contaminants are not listed hazardous waste. Some soil testing has identified soils that exhibit hazardous characteristics, and if excavated, these soils would need to be treated to meet RCRA Land Disposal Restrictions prior to disposal in a RCRA compliant unit.

Location- and Action-specific ARARs would be met under all the active alternatives.

The site does not contain any wetlands nor is it considered located in a flood plain or coastal zone.

Groundwater

The groundwater Cleanup Goals (see Table 2) are MCLs or groundwater quality standards and, therefore, ARARs. Alternative G1 (No Action) would not meet ARARs. Alternative G2 (MNA and Institutional Controls) relies on the effectiveness of a complimentary soil remedy to remediate source areas, after which natural attenuation would eventually allow the aquifer to recover. Depending upon the selected soil remedy, the most highly contaminated arsenic in groundwater would not recover in a reasonable time frame under Alternative G2. None of the active groundwater treatment Alternatives (G3, G4 and G5) are expected to restore the aquifer without implementation of a soil source control remedy.

Alternatives G2 through G5 would require institutional controls, such as a CEA, to control use of the groundwater until groundwater Cleanup Goals can be met.

Because the No Action alternatives (S1 and G1) do not meet the threshold criteria (Protection of Human Health and the Environment and Compliance with ARARs), they were eliminated from consideration under the remaining seven criteria.

3. **Long-term Effectiveness and Permanence**

Soils

Alternative S6 offers the highest degree of permanence because it is expected to achieve the greatest removal of arsenic and VOCs from the soils through excavation and off-site treatment and disposal. Alternative S4 is the next best alternative relative to long-term effectiveness since the largest mass is removed from the site. Alternatives S3 and S5 are ranked lower than S4 and S6, since they involve in-situ treatment of the soil sources areas, but are still effective and permanent in the long-term. Alternative S2 is considered the least effective alternative in the long-term because it does not remove VOCs or arsenic or limit leaching to groundwater.

Groundwater

While several of the groundwater alternatives can adequately control the groundwater contamination and even reduce contaminant mass, none of the groundwater alternatives are effective in the long term without the implementation of a source control remedy for soils. In addition, the presence of clay and silt lenses within the shallow aquifer will make groundwater restoration difficult, especially for arsenic, since metals tend to sorb onto clay particles making them difficult to remediate.

Alternative G5 ranks higher than Alternative G3 (the two pumping alternatives) in long-term effectiveness and permanence since its goal is to restore aquifer conditions in a reasonable period of time, whereas Alternative G3 is only meant to control migration. Alternative G4 ranks higher than Alternatives G3 and G5 for the arsenic plume because the arsenic is quickly treated after injection, curtailing or eliminating mobility. Alternative G4 ranks lower than the pumping alternatives (G3 and G5) for the VOC portion of the plume.

Alternative G2, Natural Attenuation and Institutional Controls, may not attain the goal of aquifer restoration in a reasonable time frame, because the highest concentrations of arsenic in the groundwater may take 50 or more years to reach acceptable levels.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that are legally applicable, or relevant and appropriate to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

4. **Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment**

Soils

Alternative S2 does not reduce the mobility, toxicity or volume of contaminants through treatment.

SVE is the only technology considered that would destroy contamination from the Source Areas, reducing the toxicity, mobility and volume of the VOC contamination. Solidification also would reduce the toxicity and mobility, but not the volume, of the arsenic Source Areas because the metal contamination would remain on site. Solidification can result in an increase in contaminant volume, through the addition of concrete mixtures to the soil.

Regarding off-site disposal remedies, only Source Area soils that would be considered RCRA characteristic waste would be treated prior to disposal. Therefore, Alternatives S6, S5 and S4, which address the Source Areas through removal, are comparable.

Alternatives S3 and S5 would be rated highest in this criterion by addressing the VOC Source Area soils through treatment. Alternatives S3 through S6 are comparable with regard to addressing the arsenic Source Area soils.

Groundwater

Alternative G4 employs a treatment technology, geochemical fixation, that reduces the toxicity and mobility of arsenic, though it does not address the VOC contamination. Pumping and treatment alternatives (G3 and G5) physically remove the arsenic (and VOCs) from the aquifer. Alternatives G4 and G5 offer a comparable level of improvement in mobility and toxicity reduction, and would be rated higher than the hydraulic containment Alternative G3.

5. **Short-term Effectiveness**

Soils

Alternative S2 has the least potential for construction-related impacts on workers, the community or the environment because it involves minimal construction.

Air monitoring would be an important component for all of the excavation alternatives (S4, S5, and S6) and for any on-site treatment technologies (S3 and S5) so that workers would wear the appropriate health and safety protection equipment during intrusive construction activities. Perimeter air monitoring would be required to assure that no vapor or dust releases occur during construction or O&M phases. Emission control techniques, such as the use of dust suppressants and minimizing the open working area of the excavation, would be employed as needed to minimize adverse affects on workers and the community from the site. Trucking routes with the least disruption to the surrounding community would be utilized.

Appropriate transportation safety measures would be required during the shipping of the contaminated soil for off-site disposal.

Alternative S6 is the most disruptive alternative to local properties because it would involve the largest soil excavation and could temporarily disrupt activities at, for example, Comarco Products.

Alternatives S4, S5, and S6 achieve remedial action objectives more quickly than Alternatives S2 and S3 since they each involve some type of excavation, which takes less time to implement. Of S4, S5 and S6, Alternatives S4 and S6 achieve remedial action objectives most quickly.

The time required for implementation of Alternative S2 is estimated at 2 months. Alternative S3 is estimated to take 2.5 years. SVE is expected to take as long as 2 years to remediate the VOC Source Areas. Alternative S4 is estimated to take 5 months, and Alternative S5 is estimated to take about 2.5 years to implement. The time frame for Alternative S3 assumes concurrent implementation of the SVE and solidification treatment technologies; however, the SVE treatment may need to be completed before solidification can be undertaken on portions of the site, extending the time frame for this alternative to as much as 4 or more years.

Groundwater

Alternative G2 has no community impacts because it involves no construction. Alternatives G3 and G5 have minimal impacts with respect to the protection of workers, the community, and the environment during remedial construction. Alternative G4 has potential worker, community and environmental impacts due to the injection of a high pH material into the aquifer and the substantial soil mixing. Some emissions of VOCs and dust would be unavoidable, though risks to public health would be minimized through air monitoring and emission control measures.

The short-term effectiveness with respect to the time until the remedial action objectives are achieved is quickest for the groundwater collection and treatment Alternatives (G3 and G5). The time frames discussed below assume a source control remedy in soils is implemented. For Alternative G5, it is expected that MCLs in groundwater (with the possible exception of the shallow groundwater closest to the arsenic Source Areas) will be achieved in as little as 10 years. Alternative G3, which is a containment remedy, has a remediation time frame for the VOCs (20 years) but does less to actively address the highest arsenic contamination. Alternative G4 will achieve the remedial action objectives faster than Alternative G3 for arsenic, but will rely on natural attenuation of the VOC plume, which will take longer. Alternative G2 would reach the Cleanup Goals in 45 years, through natural attenuation, after the source is removed.

6. **Implementability**

Soils

No technical implementability concerns exist for Alternatives S2, S4 and S6. All technical components of these Alternatives would be easily implemented using conventional construction equipment and materials. Alternatives S3 and S5 would require treatability studies during remedial design, evaluating how best to implement the SVE system to remove the VOCs, and the solidification of the arsenic. Even after treatability studies to determine the appropriate injection points, solidification agents, dosage rates, and other performance parameters, the uncertainties regarding the implementability would still be high, especially given the heterogeneous nature of the fill material at the site.

Groundwater

Alternatives G2, G3 and G5 can be constructed at the site, and no technical or administrative implementability problems are expected for these alternatives. There is some uncertainty as to the effectiveness of the two pumping remedies, Alternatives G3 and G5, in removing arsenic in the shallowest zones where arsenic concentrations are highest. Neither Alternative G3 or G5 may be able to meet the arsenic MCL in the shallow groundwater because of the relatively thin saturated thickness and low permeability of the soil. These conditions could lead to dewatering of the shallow groundwater above the clay and limit the ability to flush dissolved arsenic to the collection wells.

Alternative G4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G4, relative to all other groundwater alternatives.

7. **Cost**

Soils

Alternative	Cost
S1	$0
S2	$3,310,000
S3	$3,630,000
S4	$6,580,000
S5	$6,190,000
S6	$8,300,000

Groundwater

Alternative	Cost
G1	$0
G2	$550,000
G3	$7,800,000
G4	$1,700,000
G5	$6,600,000

8. **State/Support Agency Acceptance**

The State of New Jersey is still evaluating EPA's preferred alternatives in this Proposed Plan.

9. **Community Acceptance**

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be described in the Record of Decision, the document that formalizes the selection of the remedy for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

The preferred alternatives for cleanup of the Martin Aaron site are Alternative S4, excavation and off-site transportation of source areas, and Alternative G5, groundwater collection and treatment, hereafter referred to as the Preferred Alternatives.

Alternative S4 includes excavation, transportation and disposal of approximately 28,000 cubic yards of contaminated soil from the Arsenic and VOC Source Areas, coupled with capping of the residual soil contamination that still poses a direct contact threat, and institutional controls on future land use.

All RCRA characteristic hazardous wastes would be sent for off-site treatment prior to land disposal. The excavations would be backfilled with clean fill. The Preferred Soil Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal, and is expected to allow the site to be used for its reasonably anticipated future land use, which is commercial/industrial. The Preferred Soil Alternative reduces the risk within a reasonable time frame, and at a cost comparable to other alternatives that use on-site treatment, and provides for long-term reliability of the remedy. Although S3 and S5 were similar in some respects, Alternative S4 was chosen because it has fewer uncertainties in addressing the Source Areas, at a cost comparable to S3 and S5. Since the preferred alternative would achieve the direct contact Cleanup Goals that are protective for commercial/industrial land use, but would not achieve levels that would allow for unrestricted use, institutional controls, such as a deed notice, would be needed.

Alternative G5 includes the installation of groundwater extraction wells to extract and treat the contaminated groundwater, with the goal of restoring the aquifer to the groundwater Cleanup Goals. The extracted groundwater would be pretreated on site using a combination of technologies, such as air-stripping and vapor-phase carbon to address the VOCs and chemical precipitation to address metals, prior to discharge to CCMUA. The actual pretreatment requirements would be determined during remedial design in consultation with CCMUA. Institutional controls such as a CEA would be put in place until the Cleanup Goals are achieved.

The preference for Alternative G5 over other groundwater alternatives is based on a number of factors. With the removal of the VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame; however, the same cannot be said for the arsenic contamination. The removal of the arsenic soil Source Area, as recommended by EPA in this Proposed Plan, is expected to result in some reductions in groundwater arsenic levels, but residual arsenic contamination levels are expected to persist in groundwater. While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations in a relatively short time frame (estimated at 10 years).

The goal of Alternative G5 would be to restore the groundwater to the Cleanup Goals, which are MCLs and groundwater quality standards. With the removal of the soil Source Areas, this goal appears achievable; however, certain site factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination, may limit the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame. Alternative G5 would include a groundwater monitoring program that would evaluate the performance of the remedy over time. Groundwater monitoring would be used to optimize pumping operations and evaluate the likelihood that remedial goals can be achieved through continued or modified pumping.

Institutional controls, such as a Classification Exception Area, would be used to protect public health until the groundwater cleanup goals can be achieved.

The Preferred Alternatives are believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes the Preferred Alternatives would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Because the Preferred Soil Alternative would treat the RCRA hazardous materials constituting principal threats, the remedy also would meet the statutory preference for the selection of a remedy that involves treatment as a principal element. The selected alternative can change in response to public comment or new information.

Since the Preferred Alternatives would result in contaminated soil remaining on site, institutional controls would be employed to ensure that any future site activities are performed with knowledge of the site conditions including the implementation of appropriate health and safety controls, and to prohibit future unrestricted use of the property.

COMMUNITY PARTICIPATION

EPA and the State of New Jersey provide information regarding the cleanup of the Martin Aaron site to the public through public meetings, the Administrative Record file for the site, and announcements published in the newspaper. EPA and the State encourage the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted there. The dates for the public comment period, the date, location and time of the public meeting, and the locations

of the Administrative Record files, are provided on the front page of this Proposed Plan. EPA Region 2 has designated a point-of-contact for community concerns and questions about the Superfund program. To support this effort, the Agency has established a 24-hour, toll-free number the public can call to request information, express concerns or register complaints about Superfund. The Public Liaison Manager for EPA's Region 2 office is:

George H. Zachos
Toll-free (888) 283-7626
(732) 321-6621
U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837

For further information on the Martin Aaron site, please contact:

Mark Austin
Remedial Project Manager
(212) 637-3954

Natalie Loney
Community Relations
Coordinator (212) 637-3639

U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

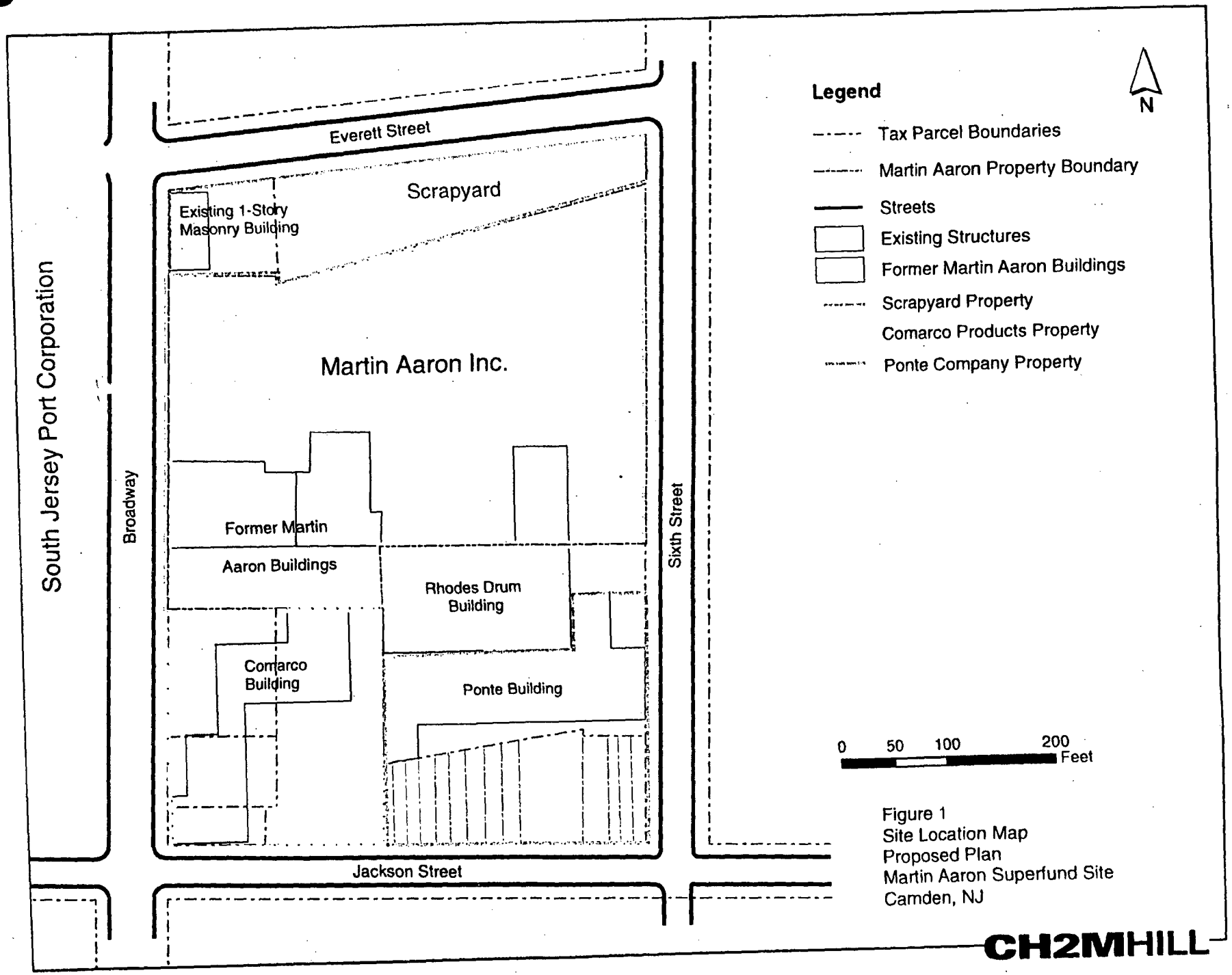

Figure 1
Site Location Map
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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500206

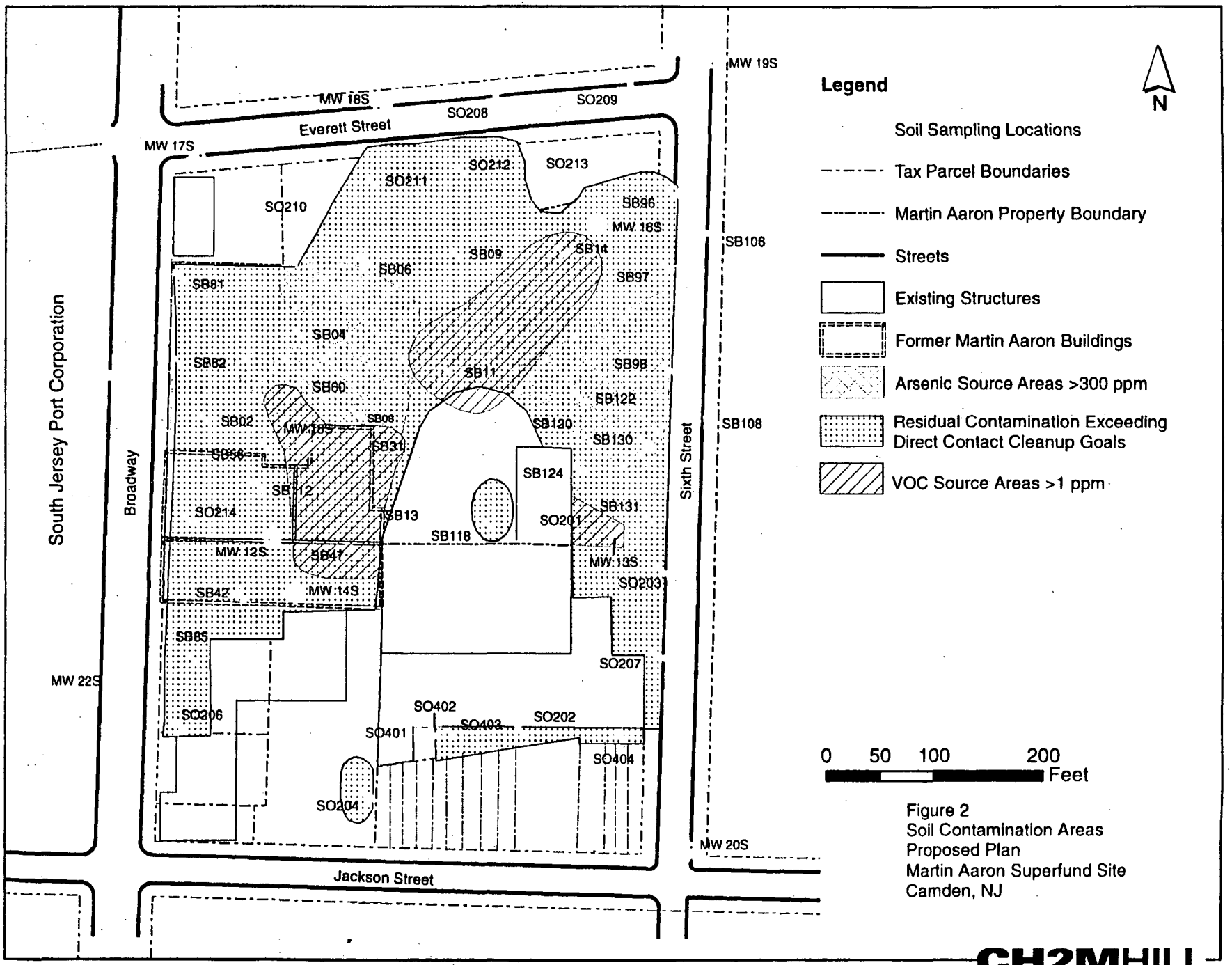

Figure 2
Soil Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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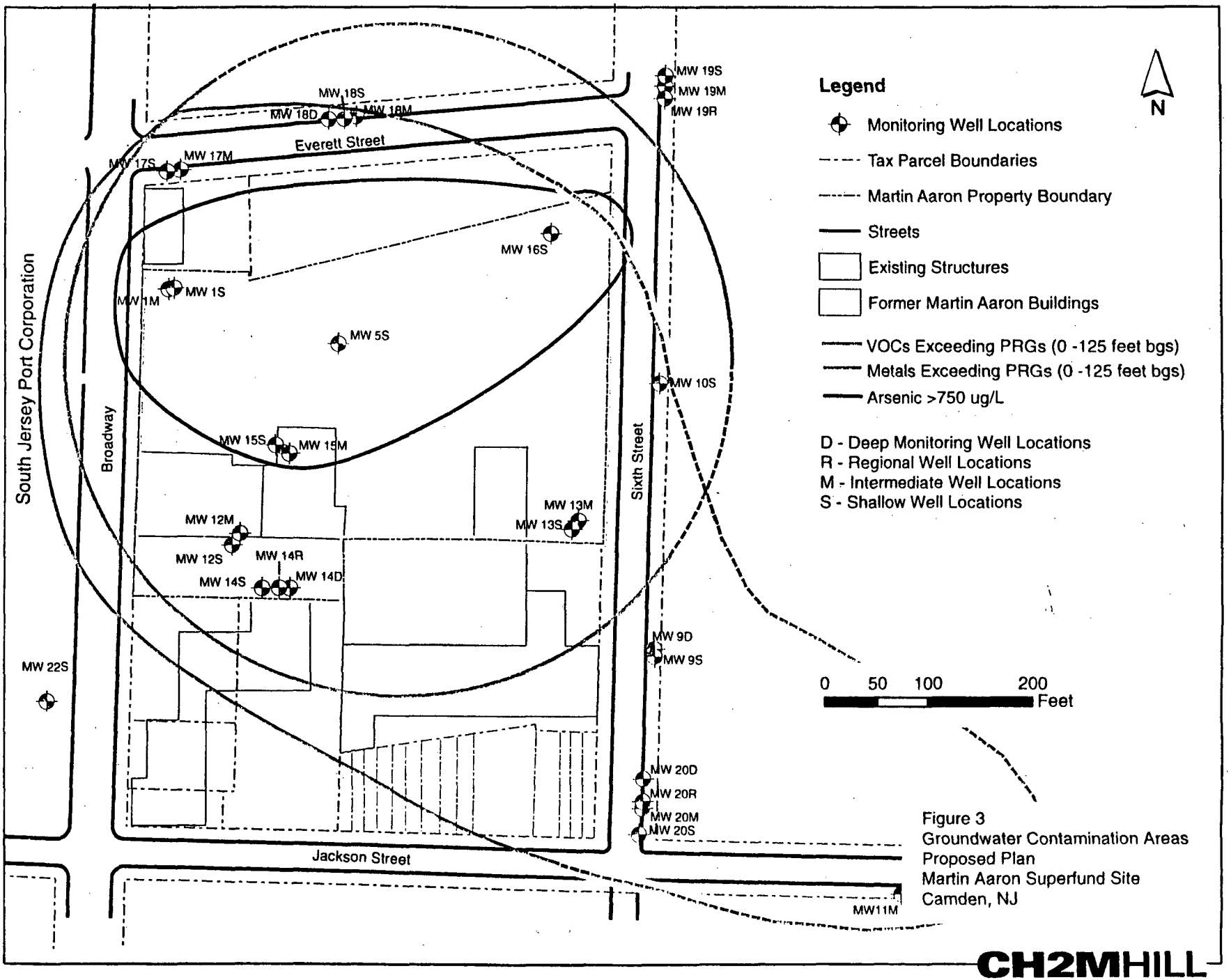

Figure 3
Groundwater Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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Table 1
Cleanup Goals for Soil
Martin Aaron Site

Chemical	EPA Direct-Contact Cleanup Goals (Commercial/Industrial)	New Jersey Non-Residential Soil Cleanup Criteria	Source Area Cleanup goals
Metals			
Arsenic	1.6[2]	20	300
VOCs			
Benzene	1.4	13	1
Bis(2-chloroethyl)ether	0.58		
Chloroform	0.47	28	1
Tetrachloroethylene	1.3	6	1
Trichloroethylene	0.11	54	1
Vinyl Chloride	0.75	7	10
SVOCs			
Benzo[a]anthracene	2.1	4	
Benzo[a]pyrene	0.21	0.66	
Benzo[b]fluoranthene	2.1	4	
Benzo[k]fluoranthene	21	4	
Dibenzo[ah]anthracene	0.21	0.66	
Indeno[123-cd]pyrene	2.1	4	
Pesticides			
Aldrin	0.10	0.17	
Dieldrin	0.11	0.18	
PCB - Aroclor 1254	10	2	
PCB - Aroclor 1260	10	2	

Notes:
1. All criteria expressed as parts per million (ppm).
2. NJDEP's arsenic citerion of 20 ppm is derived from background arsenic concentrations found throughout the State of New Jersey. EPA used 20 ppm as its direct contact Cleanup Goal for arsenic in developing this Proposed Plan.
3. Other contaminants found at the site, primarily metals, may not be attributable to site releases. NJDEP would require engineering controls (capping) to prevent direct contact, along with land use restrictions, for soils in excess of New Jersey non-residential cleanup criteria.

Table 2
Cleanup Goals for Groundwater
Martin Aaron Site

Chemical	EPA MCL	NJ MCL	NJ GWQS
Metals			
Arsenic	10	50	8
VOCs			
Benzene	5	1	1
Bis(2-chloroethyl)ether	NA	NA	10
Tetrachloroethylene	5	1	1
Trichloroethylene	5	1	1
Vinyl Chloride	2	2	5
Pesticides			
Dieldrin	NA	NA	0.03

All criteria expressed as parts per billion (ppb).

Attachment B

EPA is hosting a Public Meeting for the Martin Aaron Superfund Site

The U.S. Environmental Protection Agency invites you to attend a public meeting to discuss the Proposed Plan to address contaminated soils and groundwater at the Martin Aaron Superfund site in Camden, New Jersey.

The meeting will be held at the Camden County Municipal Utilities Auditorium (CCMUA) at:

1645 Ferry Avenue
Camden, New Jersey
on Tuesday July 26, 2005
at 7:00 PM

To request a copy of the Proposed Plan you can,

e-mail Natalie Loney, Community Involvement Coordinator:
loney.natalie@epa.gov

or call Natalie: (212) 637-3639 or toll-free at 1-800-346-5009

or visit EPA's website:

http://www.epa.gov/Region2/superfund/npl/martin_aaron_proposal2005.htm

The public comment period for this Proposed Plan runs from **Friday, July 15, 2005 to Monday, August 15, 2005.** All written comments should be mailed to:

Mark Austin, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY
10007-1866

Or you can e-mail your comments to:
austin.mark@epa.gov

500212

EPA is extending the comment period for the Martin Aaron Superfund Site

The U.S. Environmental Protection Agency is extending the deadline of the public comment period for the Proposed Plan for the Martin Aaron Superfund site from **Monday, August 15, 2005** to **Wednesday, September 14, 2005**.

The proposed plan contains EPA's options as well as the preferred alternative to address contaminated soils and groundwater at the Martin Aaron Superfund site in Camden, New Jersey.

To request a copy of the Proposed Plan you can,

e-mail Natalie Loney, Community Involvement Coordinator:
loney.natalie@epa.gov

or call Natalie: (212) 637-3639 or toll-free at 1-800-346-5009

or visit EPA's website:
http://www.epa.gov/Region2/superfund/npl/martin_aaron_proposal2005.htm

All written comments on the Proposed Plan should be mailed to:

Mark Austin, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY
10007-1866

Or you can e-mail your comments to:
austin.mark@epa.gov

500213

Attachment C

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 11

IN REGARD TO THE MATTER OF:

WELSBACH/GENERAL GAS MANTLE
CONTAMINATION SITE
-AND-

MARTIN AARON SUPERFUND SITE

TRANSCRIPT OF
PROCEEDINGS
OF PUBLIC MEETING

ORIGINAL

* * * * *

TUESDAY, JULY 26, 2005

* * * * *

Transcript in the above matter taken at CAMDEN COUNTY MUNICIPAL UTILITIES AUTHORITY AUDITORIUM, 1645 Ferry Avenue, Camden, New Jersey, commencing at 7:00 p.m.

Certified Shorthand Reporting Services
Arranged Through
MASTROIANNI & FORMAROLI, INC.
709 White Horse Pike
Audubon, New Jersey 08106
(609) 546-1100

1 A P P E A R A N C E S:

2 ENVIRONMENTAL PROTECTION AGENCY

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COORDINATOR - PUBLIC OUTREACH BRANCH

4 290 BROADWAY
26TH FLOOR

5 NEW YORK, NEW YORK 10007
(212) 637-3639

6

RICHARD J. ROBINSON - PROJECT MANAGER

7 WELSBACH/GENERAL GAS MANTLE
290 BROADWAY

8 19TH FLOOR
NEW YORK, NEW YORK 10007

9 (212) 637-4371

10 JOHN PRINCE - EMERGENCY & REMEDIAL RESPONSE
DIVISION

11 MARTIN AARON
290 BROADWAY

12 NEW YORK, NEW YORK 10007
(212) 637-4380

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1 P R E S E N T A T O N I N D E X

2 WELSBACH/GENERAL GAS MANTLE

PRESENTATION BY RICHARD ROBINSON

3 PAGE 9

4 MARTIN AARON SUPERFUND SITE

PRESENTATION BY JOHN PRINCE

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1 P U B L I C P O R T I O N I N D E X

2

RICHARD CHAPIN: PAGE 40

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OLGA POMAR, ESQUIRE: PAGE 61

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ROGER NOGAKI: PAGE 72

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JANE NOGAKI: PAGE 80

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BARBARA PFEIFFER: PAGE 93

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BOB SPIEGEL: PAGE 103

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KELLY FRANCIS: PAGE 120

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PETER MONTAGUE: PAGE 125

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HELENE PIERSON: PAGE 135

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THEODORE CARRINGTON: PAGE 136

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1 MS. LONEY: My name is Natalie Loney,
2 I'm the community involvement coordinator for the
3 Martin Aaron Site, I'm also the community involvement
4 coordinator for the Welsbach/General Gas Mantle
5 Superfund Site. Most of you are -- maybe -- many of
6 you may be aware of the fact that there is another
7 superfund site in Camden -- the City of Camden,
8 particularly in this portion of the -- in this
9 portion of Camden, Waterfront South, there is the
10 general Gas Mantle Facility and since we were coming
11 here to talk about Martin Aaron and the proposed plan
12 to address contamination at the Martin Aaron Site, we
13 thought it fitting that we also discuss the work that
14 is -- the proposed plan rather for contamination at
15 the Welsbach Site, so this meeting actually will be
16 covering both the Martin Aaron Superfund Site and the
17 Welsbach -- a portion of the Welsbach Site.
18 We're going to start with the Welsbach
19 portion and then we'll move on to the -- to the
20 Martin Aaron portion of the evening.
21 We have a -- since this is a public
22 meeting and we are going to be discussing a proposed
23 plan, all of this information is being recorded by
24 our court reporter, so I would ask that at the end of
25 the presentation when we do the Q and As that you

1 state your name for the record and speak clearly.
2 I've already covered the introduction
3 portion. This is the agenda for the evening. For
4 the Welsbach portion of the presentation, Rick
5 Robinson, who is the remedial project manager for the
6 Welsbach Site, will be coming to talk about -- talk
7 about -- give you the information about the proposed
8 plan for Welsbach.
9 I wanted to go over with you all
10 briefly, it looks a little bit confusing but it
11 really isn't, this is the milestones in the superfund
12 process and I just wanted to talk briefly about where
13 we came from and where we are with regard to the --
14 to the continuum of the life cycle of a superfund
15 site.
16 Initially, there's a -- whenever a
17 superfund site comes into existence, it usually
18 starts off with discovery. Many times a site might
19 be identified by a state entity, the New Jersey
20 Department of Environmental Protection, sometimes it
21 may even be a concerned citizen that notifies EPA and
22 we begin an investigation and we may -- it may
23 actually turn out to be something more and may become
24 a superfund site.
25 Once a site discovery takes place, we go

1 through something called a preliminary assessment and
2 a site inspection. What happens in the preliminary
3 assessment is that we begin to collect any available
4 data and information about any known or suspected
5 releases at that facility. The technical phase
6 follows the site inspection where we actually go out
7 and do preliminary inspection of the site.
8 That information is put together in
9 something -- and we go through something called a
10 hazardous ranking -- hazard ranking system. That --
11 that information, gleaned from the information search
12 in the site inspection, each site is scored and once
13 it gets a particular number, it then qualifies for
14 and is then listed on the NPL, the National
15 Priorities List, which is a list of all of the
16 superfund sites in the country.
17 Martin Aaron has gone through this
18 process and -- both Martin Aaron and Welsbach have
19 gone through this process and they were both listed
20 on the NPL making them federal superfund sites, they
21 then become eligible for superfund dollars.
22 Once we go through the site assessment
23 phase and the site is listed as a superfund site, we
24 then move into the remedial phase or the cleanup.
25 We -- once the site is listed, we've already begin

1 the preliminary assessment, we now move into
2 something called the RIFS, the remedial and
3 investigation and feasibility study.
4 What that basically is is we go out and
5 gather information, actually go to the site and do
6 pretty extensive investigation, sampling, that sort
7 of thing and that information helps us to determine
8 the nature and extent of the contamination and that
9 information is the basis for the proposed remedial
10 action plan which is what we're talking about this
11 evening.
12 The proposed remedial action plan, once
13 we've defined the nature and extent of contamination
14 at the site, we then have to figure out well, what's
15 the best way of addressing it, what's the best way of
16 cleaning up the site.
17 We put together this document that looks
18 at available technologies and what is the best
19 approach to addressing contamination at any
20 particular site.
21 Tonight, we're going to be presenting
22 that proposed plan, that proposed remedial action
23 plan, what does EPA think is the best way to address
24 the cleanup. And we're going to be talking about the
25 Martin Aaron Site and in addition the Welsbach

1 Facility.

2 Once we've completed this proposed

3 remedial action plan, there will be a document

4 forthcoming called the record of decision. That is

5 the document that says, well, EPA -- we -- this is

6 the -- this is what we believe is the best remedy,

7 this is the decision that has been made out of

8 those -- the series of alternatives for cleanup, this

9 is the one that has -- we've decided on.

10 Once we've made our decision as what --

11 how to clean up the site, we then go into the latter

12 phases of remediation of a site, actually designing

13 that particular -- that particular cleanup and then

14 moving on to actually building it, whatever -- or

15 whatever the -- whatever the selection is. If it

16 requires construction on site or off site, that's

17 this phase.

18 We then -- once we've gone through all

19 of that and the actual cleanup begins, goes into the

20 operation & maintenance mode. For some sites, the --

21 once it goes through O & M, and the contamination is

22 cleaned up from a particular site, that site then

23 becomes eligible for deletion off the of the

24 superfund list.

25 It then is removed from the list, it's

1 no longer listed as a superfund site. It is, for all
2 intents and purposes, a clean site.
3 So from discovery, through the
4 preliminary inspection, through listing, from listing
5 to designing the remedy, to implementing the remedy,
6 to cleaning up and finally deletion of the site from
7 the superfund list.
8 And this -- let me go back for a second.
9 I'm going to turn over the podium to Rick Robinson,
10 he's going to be presenting, again, on the
11 Welsbach/General Gas Mantle Facility.
12 I just want to let you know, again, the
13 way the evening will move forward, we'll do the
14 presentation on both sites. At the end of the
15 presentations, we'll open the floor for questions.
16 Again, please speak -- state your name for the record
17 and please speak clearly for the court reporter.
18 MR. ROBINSON: Thanks, Natalie.
19 Again, my name is Rick Robinson, I'm the
20 project manager for the Welsbach/General Gas Mantle
21 Superfund Site. Welsbach/General Gas Mantle Site is
22 located in the cities of both Camden and Gloucester
23 City. I'll just show you map in a few minutes.
24 Little bit on the site history. Back in
25 1885, Dr. Carl Vaughn (phonetic) or Welsbach invented

1 the process of manufacturing gas mantles using
2 thorium and what thorium does, it makes the mantles
3 glow brightly and gas mantles, as shown in the
4 picture here, gas mantles are the -- like in a
5 camping lantern and when you -- when the gas gets in
6 there, it lights up with bright white light.
7 And back at the turn of the century,
8 they were -- they were used as -- in competition with
9 electric light until electric light basically put the
10 gas mantle industry out.
11 But the Welsbach Facility is located in
12 Gloucester City off of Essex Street and along King
13 Street and in 1890s, they started manufacturing the
14 gas mantles and by 1940, they went out of business.
15 And in Camden, over on 4th and Jefferson
16 is the General Gas Mantle Facility and that was a
17 much smaller competitor to the Welsbach Facility.
18 Little information on General Gas Mantle is really
19 known. We know that they used and resold radium and
20 thorium, they did not process any ores as did
21 Welsbach.
22 The site was originally identified in
23 1980 when they did a record search of the U.S. radium
24 site in Orange, New Jersey and then in 1981, EPA
25 sponsored an aerial radiological flyover and that

1 radiological flyover identified five areas in Camden
2 and Gloucester City with elevated radiological
3 readings.
4 Then in the early '90s, the State of New
5 Jersey came out and investigated over 1,100
6 properties in both communities and as a result of
7 those investigations, they did a number of interim
8 actions such as moving out the current owner or the
9 owner at the time of the Gas Mantle building in
10 Camden, Ste-Lar Textiles, and relocated them and they
11 also put shields in basements and -- and relocated
12 one resident in Gloucester City.
13 After the state did their interim
14 actions, they decided that the list -- that the site
15 was a little bit larger than they could handle
16 themselves and so they proposed it to the NPL.
17 The Welsbach Site is currently four
18 operable units. Operable Unit 1 includes the remedy
19 for the cleanup of the both gas mantle facilities,
20 the residential properties, commercial properties and
21 some municipal park properties and that ROD was
22 signed in July 1999 and the cleanup for that work is
23 currently underway.
24 Today, we're here to talk about OU3
25 which is the surface water bodies adjacent to the

1 Welsbach Site, the Delaware River, Newton Creek and a
2 small lake in Gloucester City called Martins Lake.
3 Here's a site photograph, aerial
4 photograph, showing the site. There's the two study
5 areas in Camden. Waterfront South we call Study Area
6 1, we have the Fairview section of Camden which is
7 Study Area 4 and then we have four study areas in
8 Gloucester City.
9 Here's a closeup aerial of the Study
10 Area 1 in Camden, currently we are at CCMUA right in
11 here, this is Ferry, this is Broadway. Over South
12 4th and Jefferson is the former gas mantle facility
13 in yellow and up in the blue in the right-hand corner
14 of the map is the Martin Aaron Facility.
15 And as we were doing our background
16 investigation to collect some background samples, we
17 collected some samples up in this area which we
18 happened to find some radiological contamination that
19 appears to be related to the General Gas Mantle
20 Facility. We're currently investigating that right
21 now.
22 The 1990 ROD remedy included demolition
23 of the former gas mantle building in Camden,
24 excavation of the radiological contaminated soils and
25 debris at the Welsbach Site and disposal of material

1 at an off site landfill.

2 In that ROD, EPA also stated that what

3 addressed potential site impacts to the surface water

4 sediment and wetlands area in a future study. And in

5 April 2001, we started that study. We completed an

6 ecological screening level assessment in March 2002

7 and in January 2005, we completed a human health risk

8 assessment for the surface waters, sediment and

9 wetlands.

10 The purpose of the investigation was to

11 determine if the radionuclides from the site

12 contaminated the adjacent water bodies and evaluate

13 the risk to human health and the environment. The

14 sediment sampling areas included the Delaware River

15 storm water out falls, Newton Creek, and a small like

16 in Gloucester City.

17 EPA also collected background samples as

18 part of its investigation and we collected background

19 samples from Newton Creek, the north branch of Newton

20 Creek, south branch of Newton Creek, Little Timber

21 Creek and a small lake in -- I think it's called

22 Millers Lake, small lake called Millers Lake, it's

23 south -- southeast of Gloucester City.

24 As part of our sediment sampling, we

25 collected sediment and radiological and chemical

1 samples in the Delaware River, Newton Creek and the
2 background areas. And the results of that sampling
3 indicated that all the radiological samples we
4 collected in the sediment areas were all within the
5 range of background.
6 The chemicals that we found in the
7 sediments were not related to the Welsbach Site and
8 the sample data from -- sample data that we collected
9 was used for both human health and screening level
10 ecological risk assessments. And these reports are
11 available at the local information repositories, the
12 Gloucester City Library, the Camden Public Library
13 downtown and also the Heinz Center here in the
14 Waterfront South community.
15 To summarize risk assessment, the
16 exposure pathways, the cancer risk and non-cancer
17 hazards for all the radionuclides were within EPA's
18 risk range or below EPA's level of concern and that
19 the sediment samples were -- for the ecological risk
20 assessment, the sediment samples were also below the
21 sediment benchmark criteria and there were no
22 ecological risks.
23 So to summarize the Welsbach OU3
24 investigation, we found no radiologicals --
25 radionuclides above background levels in the surface

1 water sediment and wetland areas, the human health
2 and ecological risks from the radionuclides were at
3 or below EPA's level of concern and, therefore, EPA
4 proposed no action for the surface water and sediment
5 in wetland areas at the site.
6 And that concludes the Welsbach
7 presentation.
8 MS. LONEY: Comment period.
9 MR. ROBINSON: Oh, yes. What we have
10 done is we extended the Welsbach public comment
11 period for OU3 until August 2, 2005, we have copies
12 of the proposed plan at the table and you're to
13 submit written comments to myself or Natalie Loney
14 and our names are in the -- and addresses are in the
15 proposed plan also.
16 On that note, I'd like to turn it back
17 to Natalie and I'll switch the presentations.
18 MS. LONEY: Thank you, Rick.
19 Now, we're just -- we're going to move
20 ahead and talk about the Martin Aaron Superfund Site
21 proposed remedial action plan.
22 Part of what we do at EPA, particularly
23 around superfund sites, includes community
24 involvement which is what my role is. Part -- it's
25 important for us to hear the concerns of a community,

1 that's why we obviously have a public meeting, in
2 addition copies of the proposed plan are available to
3 you, there was a -- a mailing was sent out, the
4 proposed plan can be accessed online, I did receive
5 some calls from folk who wanted a hard copy mailed to
6 them, I did that as well, so there is ample
7 opportunity, apart from this evening, to review the
8 document at length and submit your comments to us.
9 The comment period for the Martin Aaron
10 proposed plan is -- starts July 15th and it ends
11 August 15th, so after this evening -- after we've
12 done -- completed our presentation, even if you
13 aren't -- unable to make a comment tonight, but you
14 have an opportunity to do so at a later date, you can
15 submit comments to myself and we'll give you the
16 information for the RPM for the site, Mark Austin,
17 both of our names, addresses, phone numbers and
18 E-mail addresses are on the proposed plan and you
19 could send comments to us either tonight or you can
20 E-mail or mail us your comments.
21 In addition, copies of the proposed plan
22 are available at the Camden Public Library and it's
23 available in Waterfront South at the Heinz Center.
24 These are some of the names of people
25 who you can contact for additional information about

1 the Martin Aaron Site, John Prince, who will be doing
2 the presentation this evening, he is the section
3 chief, Mark Austin is the -- Mark Austin is the
4 remedial project manager of the site, I think you're
5 familiar with this name, that's me, and the site
6 attorney is Michael Van -- I always pronounce his
7 namely incorrectly, so I'll just say Michael. You
8 could also contact him.
9 If you -- if you can't get all -- you
10 don't have to worry about jotting down all this
11 information right now, we can provide you with it at
12 the end of the meeting.
13 I did make mention of where you could
14 get additional information about the site. The
15 information repositories, if you happen to be in New
16 York City, you could pay us a visit at 290 Broadway,
17 we have all of the documentation associated with work
18 at the site there, in addition there's the library in
19 Camden and also in the Heinz Center.
20 In addition, the proposed plan is on the
21 EPA web page and you can access that at home or if
22 you don't have computer access, you can go to your
23 local library or you could take a hard copy of the
24 document with you this evening.
25 I'm going to turn over the clicker and

1 pointer and magic wand to John Prince and he's going
2 to be discussing the proposed plan for Martin Aaron.
3 MR. PRINCE: Thank you, Natalie.
4 I would like to mention with regard to
5 the public comment period that we have received a
6 request for an extension to the Martin Aaron public
7 comment period and we're evaluating that request and
8 if -- if the comment period is going to be extended,
9 it will be in an announcement in the newspaper, so we
10 will -- we will make that information available if,
11 indeed, the comment period is to be extended beyond
12 August 15th.
13 Now, we have, with regard to Martin
14 Aaron, a lot of information that I might present and
15 I have lots of slides that detail a number of
16 different aspects of a relatively complex
17 investigation, I'm going to try and call it down to a
18 reasonable amount of information for a couple of
19 reasons, one, so that we can get to the questions and
20 comments part of the evening which, frankly, tends to
21 bring out the -- what we might have missed anyway in
22 the presentation and it's why many of you are here
23 and, in essence, what I'm doing is summarizing
24 information that is also available in the proposed
25 plan.

1 So in context, we saw from Rick's
2 presentation, that the -- the -- this section of
3 Waterfront South includes, as he highlighted, several
4 properties that are associated with the Martin Aaron
5 Site.
6 The two lots that are highlighted here,
7 and we'll look at in much closer detail, are on each
8 side of Broadway, one is where a company called
9 Martin Aaron and several other drum reconditioning
10 facilities operated and then there's property across
11 the street that's owned by the South Jersey Port
12 Corporation, it's also known as the Lika (phonetic)
13 property and it was also a subject of EPA's
14 investigation because at one time, Martin Aaron, the
15 company, leased that property, so it became within
16 the scope of the investigation for that reason.
17 For the Martin Aaron Site, we looked at
18 other areas, too, as you will see in the
19 investigation. Now, one obvious question that --
20 that comes to mind when you look at a little property
21 that involves a few lots as identified here is why is
22 this site relatively small when the Welsbach site and
23 the General Gas Mantle Site was -- seemed to spread
24 into a number of different areas and the distinction,
25 you'll see, comes from the types of operations that

1 took place there.

2 The size of the thorium sites is

3 substantially derived from what they were doing.

4 They brought ore in that had thorium in it, for

5 instance, and they needed to mill it and remove the

6 thorium for use and then they had lots of ore left

7 over and that ore kind of went all over the place

8 and, hence, that sort of reflects the size of that

9 site.

10 I'll go through some of the history here

11 and you'll see it's a little bit more localized, a

12 little bit more concentrated on the lots that we

13 really focused on.

14 Now, we've narrowed down to primarily

15 the Martin Aaron lot which is this one sort of in the

16 middle of this block which is surrounded by Broadway,

17 Jackson, 6th Street and Everett. The South Jersey

18 Port Corporation property is over here across

19 Broadway and there are couple of other landowners in

20 this area or separately owned lots. A property that

21 we refer to as a scrap yard immediately to the north

22 of the Martin Aaron lot, a currently operating meat

23 processing facility Comarco and then the Ponte

24 Equities Property also immediately to the south down

25 here where there is several large buildings.

1 I will note on this map that -- and
2 you'll see this in more detail in the proposed plan
3 that there is a building here that has a sort of a
4 reverse "L" shape that appears to be two separate
5 buildings because there's a property line that runs
6 down the middle of it.
7 In fact, those buildings were -- that
8 building was all built apparently at one time and
9 then some time later, the lots were broken up
10 differently and a lot line appears to go right down
11 the middle of it, and I'll clarify some of that by
12 going into some of the -- some of the history.
13 A lot of information here, even more in
14 the proposed plan, I'm just going to hit on a couple
15 of the highlights. The -- the main sort of central
16 part of the facility, this part where it says Martin
17 Aaron, Inc. was originally a tannery, this is going
18 back into the 1880s at least and maybe earlier and it
19 was used for tannery operations probably into the 40s
20 and then related operations into -- into the '60s.
21 A subsequent site use was related to
22 Martin Aaron, Inc. which was a company that would
23 accept drums that were empty or also almost empty
24 from various facilities, would clean them out and
25 would recondition them, paint them and make them

1 available for reuse. Martin Aaron was one of several
2 companies that operated there. They happened to be
3 the one that got saddled with the name. There was
4 another name of the site. There was another company
5 called Rhodes Drums that operated in, in essence, the
6 part of this building that sticks out into Martin
7 Aaron, Inc. on to that property.
8 We've also drawn in or shaded in where a
9 building that was owned and operated by the Martin
10 Aaron Company was located on this map. There is some
11 other businesses in the area that may have also
12 contributed contamination to the area in general,
13 maybe some of it is on these lots as a result, but
14 it's primarily based on the studies that we
15 performed, this tannery operation and then the
16 subsequent drum reconditioning operation that we
17 focused on, EPA focused on, because that's where the
18 contaminant -- contaminants pointed us.
19 The drum reconditioning operations ended
20 in the 1990s and, unfortunately, as with many sites
21 of this nature, it didn't end very neatly, there were
22 a number of drums left over, some buried material and
23 that's when first DEP, the state, and then EPA got
24 involved in first addressing emergency conditions,
25 removing hazards that were immediate, removing drums,

1 removing some of the facilities that were used to
2 recondition or clean up the drums and then do some
3 fencing and put up some signs so that people knew
4 that accessing this property posed some kind of a
5 risk and it reached the property to a point where
6 these immediate risks were really addressed short of
7 someone trespassing on to the fenced off properties.
8 Also, during this period of time, the
9 City of Camden concluded that the Martin Aaron
10 building itself just wasn't -- wasn't likely -- it
11 posed risks, physical risks, and so they had that
12 building demolished with EPA's sort of oversight to
13 make sure that it was done appropriately.
14 And during that same time when all these
15 emergency activities were taking place, EPA, at DEP's
16 request, evaluated the site for this National
17 Priorities List or this superfund list and the
18 conclusion was, yes, there was enough residual
19 contamination there after these emergency response
20 activities that were unknown that it qualified for
21 the superfund list and then it went through this
22 process of evaluating the extent of contamination and
23 the process of then evaluating what sort of remedies
24 would be appropriate to come to sort of a final
25 resolutions for this site so it could be cleaned up,

1 so it would be protected for the community and then
2 that -- so that it could be reused.
3 And that brings us to -- really to our
4 site investigation. We did a soil investigation
5 looking for other buried material that we might have
6 missed evaluating the one standing building, what we
7 call the Rhodes building to the degree that we could
8 and then collected soil samples and those soil
9 samples were on the -- this block encompassing those
10 various lots that we talked about before and then
11 they were also on this South Jersey Port Corporation
12 property because of, as I had mentioned earlier,
13 Martin Aaron's, the company's, use of that facility.
14 Now, it appears that they used it only
15 to store drums that were then processed across the
16 street and it's the really -- apparently the
17 processing -- the cleaning up process that ended --
18 that is related to the spills.
19 And so one of the conclusions of EPA's
20 investigation was, yes, there's some contamination on
21 South Jersey Port, it was a little difficult to
22 determine whether, in fact, it was really
23 attributable to these various operations that took
24 place across the street at Martin Aaron or even from
25 the tannery operation that was some years earlier.

1 One aspect of our investigation was
2 collecting borings, so we'd collect surface samples,
3 deeper samples of soils and then send them off to the
4 laboratory and also evaluate sort of the strata, the
5 sorts of soils that we found.
6 One of the things that we found
7 throughout this entire area is that there is a layer
8 of fill material, manmade material, that probably
9 started coming in around the 1860s. Earlier than
10 that, this was pretty much swampy land and wasn't
11 really available to be used, but apparently as Camden
12 expanded, this sort of material started to come into
13 this area and pretty much everywhere we looked, we
14 found this sort of layer of fill, it's not very
15 surprising in an urban area and there tend to be some
16 contaminants in this sort of fill material, it's not
17 very surprising.
18 And New Jersey, actually, has done some
19 evaluations of various areas of the state that are
20 mostly urban and has identified some areas that they
21 call containing historic fill, it was brought in many
22 years ago making the land useable, there are some
23 consequences to that and this is one of those areas
24 that they have identified as containing this sort of
25 historic fill.

1 In taking these samples, we also
2 identified some areas of contamination that are
3 clearly associated with Martin Aaron and probably
4 some contamination that's associated with the earlier
5 tannery operations.
6 Now, there is sort of two different --
7 completely different operations, the tannery would
8 have used, in particular, a lot of pesticides because
9 there's meat products and there's hides and there's
10 all sorts of opportunities for rats to be encouraged
11 to come into a tannery area and so there are -- the
12 use of arsenic base pesticides is pretty consistent
13 with a tannery facility.
14 Another thing that's frequently
15 associated with a tannery facility is that they need
16 to dry the hides and so they would need to heat large
17 spaces and the -- and they would tend to use coal and
18 coal is also associated with some of these urban fill
19 material that I mentioned earlier especially some --
20 a group of contaminants called polyaromatic
21 hydrocarbons or PAHs, some of those are cancer
22 causing.
23 We did find some of those contaminants
24 on this site. Some of them appear to align with some
25 of the areas where coal was stored many years ago and

1 the sort of center of this Martin Aaron Facility
2 where there's some sort of different colored markings
3 is sort of the center of the tannery operation and
4 also pretty much the center of the subsequent drum
5 reconditioning operation.
6 Now, drum reconditioning could be
7 anything because they bring in 55-gallon drums from
8 just about any facility that might have them to get
9 rid of and so what we found there, what we might have
10 seen is sort of what we -- what we found a lot of
11 different contaminants of various groupings, some
12 pesticides, some PCBs, some metals, some of this
13 arsenic contamination very well may be attributable
14 to some of the drums, some of the PAHs may even be
15 attributable to some of the drums that came in, but
16 the primary thing that we found that's clearly
17 associated with these drum reconditioning operations
18 are volatile organic compounds or industrial type
19 solvents and these we found in abundance, again, sort
20 of in these same areas and we've highlighted on this
21 figure, which is reproduced in the proposed plan,
22 some areas where we found levels of contamination
23 either arsenic or these VOCs or volatile organic
24 compounds at levels that are clearly much higher than
25 could be attributable to any sort of urban fill type

1 setting and they're clearly associated with
2 operations that took place at this facility.
3 One of the other conclusions, though,
4 that we drew was not really what we found at this
5 South Jersey Port Corporation property. New
6 Jersey -- the State of New Jersey approached EPA with
7 regard to that property and said, you know, we think
8 that you might consider that really that facility,
9 while it may have been used by Martin Aaron, doesn't
10 really have the same character, it doesn't seem to --
11 I'm going to talk about groundwater in a minute, but
12 it doesn't really seem to have the groundwater
13 contamination component that, again, is associated
14 with these really high levels in the middle of the
15 Martin Aaron Site, so there are other ways to address
16 sites and one of them would be sort of not including
17 them as part of the NPL site, but seek a
18 redevelopment opportunity that would involve capping
19 to prevent exposure to any material that we did find
20 there and a -- sort of a protective capping and then
21 a reuse.
22 And the EPA agreed to that assessment of
23 this facility and so it really isn't carried forward
24 in this study. This study really focuses on the area
25 where the tannery was and the area where the Martin

1 Aaron operation was located.

2 You will also see on this slide that

3 there's a whole other area where we identified

4 contamination that isn't -- aren't these really,

5 really high levels, but clearly are unacceptable and

6 that's, frankly, what we found at South Jersey Port,

7 we took samples on this right of way over here, on --

8 across the street here and down -- we took some

9 borings down here, too, and found sort of this

10 pattern which, again, isn't too surprising where --

11 while it's not Martin Aaron levels, it's certainly

12 not pristine either.

13 I wouldn't want you to be left with the

14 impression that these soils are sort of available for

15 contact, almost all of this area is fenced. And the

16 sampling that we were doing, for instance, along this

17 right of way and in some of these areas that are

18 right along the edge of the property and sort of

19 outside of the fence line, in essence, required us to

20 dig or pour through a concrete or asphalt to even

21 reach a point where we could sample.

22 So it's our definition of what EPA

23 thinks of as surface soils, it's sort of in the first

24 couple of inches, but that doesn't mean that we could

25 even collect, in this case, a sample right at the

1 surface.

2 The health risks that we -- oh, I'm

3 sorry. Let's talk about the groundwater first. We

4 did a relatively comprehensive ground water

5 investigation and found a pattern of contamination in

6 the groundwater that matches in some fashion the type

7 of contamination that we found in the soil. A number

8 of contaminants were found in the groundwater, but

9 primarily it was an area of arsenic contamination and

10 an area of these volatile organic compounds or VOCs.

11 This smaller circle is an area where the

12 arsenic groundwater contamination was quite high. It

13 is also associated -- I mean we did find it in some

14 of these other wells, but it's quite high here and it

15 drops off quite precipitously as we watched the

16 groundwater wells as we sort of moved off site.

17 Let me show you another figure that

18 might tell us the story a little bit better. But in

19 essence, here's Broadway. The direction of

20 groundwater flow is kind of from the northwest to the

21 southeast and it's sort of told a little bit better

22 by this red circle which is associated with these

23 VOCs, the volatile organic compounds, which are a

24 little bit more soluble in water and you'll see that

25 they move -- they were -- they were even at, albeit,

1 relatively low levels, they were even in some of
2 these wells that were a little bit off of the main
3 facility. Several -- this well is about 3 maybe
4 400 feet away from this sort of area where the actual
5 releases took place.
6 This well is -- this last well is -- has
7 very relatively low levels of contamination. This is
8 sort of taking that picture and slicing it sideways,
9 so here we have the site area, this is the ground
10 surface up here and these markings are about 20 feet
11 each. This information is available in other
12 settings where we can talk about it after the meeting
13 and if you want to get more clarity about this
14 figure, but you'll see that there are little lines
15 marked in here and each one of those lines represents
16 one of our monitoring wells installed for the purpose
17 of this study.
18 And some of them -- many of them are
19 relatively shallow and then several of them are quite
20 deep because we wanted to understand the complete
21 picture of the groundwater. What we see here is
22 what's called the PRM aquifer, the
23 Potomac-Magothy-Rairtan aquifer, and it consists
24 of -- it's a sandy -- sandy soils with layers of clay
25 and it's -- in particular there is sort of a -- some

1 confining layers down here that -- of clay and it's
2 pretty difficult for water, let alone contaminants,
3 to move beyond this point and there's a -- we sort of
4 suspect that the contamination, based on the sampling
5 that we've done, doesn't go -- isn't able to
6 penetrate deeper than this.
7 Now, municipal water in this area does
8 come primarily from -- from pumping of wells. The
9 nearest well to this facility is down gradient, it is
10 down here, way down here, but it's about a mile and a
11 half away and it's called -- I believe it's called
12 Emergency Well No. 7 and it is only used in emergency
13 settings when there's some issues with other wells
14 that they can't operate them for some reason and they
15 still need to have a water supply.
16 We have sampled that well several times,
17 it's also on a regular -- as part of our study, just
18 as a precaution, that well was sampled, we didn't
19 find anything attributable to the site. It is also
20 sampled, as all municipal water supplies are sampled,
21 on a regular basis. It has nothing to do with this
22 superfund program.
23 This green marking up here is basically
24 the extent of the arsenic that we found, not deeper
25 than about 40 maybe 50 feet. It is pretty much in an

1 area nearby where the soil contamination that's
2 really high in arsenic is also located and the
3 volatiles are -- take a slightly bigger swath, but
4 they are not terribly far off the site either and
5 they are most highly -- the levels of contamination
6 are much higher near the surface within the first 40
7 or 50 feet.
8 This map identifies every location where
9 we found any hit including a hit way down here which
10 is -- was above a drinking water standard but not
11 particularly highly elevated.
12 The health risks associated with the
13 site are associated with -- primarily with future
14 use, however trespasser exposures are also a concern
15 if someone were to go through -- get over a fence or
16 go through a fence.
17 The exposure or health risks are
18 primarily associated, though, with the potential for
19 reuse. There are some other factors, obviously the
20 area where the groundwater is contaminated should not
21 be used and are in above drinking water standards,
22 and that poses a risk were that water to be used.
23 And -- and there is an area where, as I
24 say, there are very high levels of site
25 contamination, primarily VOCs and arsenic, where the

1 soils themselves pose a continuing discharge, the EPA
2 believes, into the groundwater, so there is a source
3 of groundwater contamination.
4 So that's a -- about as short as I could
5 do in summarizing kind of what we found. We're going
6 to get into more details because you're going to ask
7 some good questions or clarifications and we'll try
8 and answer some of those questions when we get to
9 that part of the meeting.
10 We looked at a whole range of remedies,
11 it's part of this process, it's called the
12 feasibility study and evaluated a number of ways of
13 addressing the soils and a number of ways of
14 addressing the groundwater. I'm not going to go into
15 the details of the many alternatives that we
16 evaluated for soils or groundwater, instead I'm going
17 to go to what EPA's proposal is for both of these
18 media.
19 The process the EPA goes through
20 is relatively complex, it requires us to evaluate a
21 number of criteria, they're listed here, again, it's
22 described in great detail in the proposed plan and
23 feasibility study to -- so that we can judge these
24 alternatives that we consider against each other.
25 The preferred alternative for soils

1 focuses on -- primarily on addressing these source
2 areas, the arsenic hotspots and these VOC hotspots,
3 that we know are really much higher than anything
4 that we found on any neighboring properties clearly
5 attributable to releases to the groundwater and we're
6 recommending, after evaluating, as I say, a number of
7 on site remedies, a number of more complex solutions
8 and more expedient and for the area more
9 comprehensive solution of excavating it and taking it
10 away to a secure landfill for disposal.
11 There would still be residual levels of
12 contamination that are more associated with this sort
13 of urban fill type material that would remain after
14 that soil excavation is complete and our proposal for
15 those areas is a capping and land use control type
16 response that, based on conversations that we've had
17 with city and with a number of other interested
18 parties, fits with a reuse of this property in any of
19 a couple of commercial type end uses.
20 One -- one possible end use that's
21 memorialized in the master plan from the city is
22 possibly a farmers market type setting and with a
23 sort of capping type remedy, that would result in no
24 exposure to a subsequent use like that. Other uses
25 that involve construction buildings also would be

1 consistent with that type of reuse.

2 For the groundwater, after the soil

3 remedy is done, we've removed the sources and there's

4 a protective cap to prevent direct contact, EPA

5 expects that they'll still be -- still will be

6 residual groundwater contamination, both of arsenic

7 and of VOCs and so we've proposed a kind of an

8 aggressive approach to that which is to try and

9 remove those contaminants through what's called a

10 pump and treat type scenario.

11 The -- this sort of sandy aquifer where

12 a lot of the contaminants in the groundwater are

13 relatively close to the surface is generally amenable

14 to this type of pumping remedy.

15 There are some unknowns that we will

16 have to sort of explore as we go through the process,

17 but the steps would be something like this, complete

18 the soil remedy, we'd install a series of extraction

19 wells that would not conflict with the reuse type of

20 plan for this property, so that could sort of go

21 ahead, there would be some sort of a treatment

22 facility that would be placed at the Martin Aaron

23 Facility that would bring the groundwater contaminant

24 levels down to a level so that they could be

25 discharged to the municipal sewer system and then the

1 CCMUA would be available to accept that -- that waste
2 and really -- it's really the utility's authority
3 that would sort of set those standards how -- how
4 much treatment would be required before it could be
5 discharged and that's -- that process might take some
6 time in terms of pumping, but it's sort of turn it on
7 and do monitoring and maybe make some adjustments,
8 but, as I say, sort of a reuse approach could then
9 follow on.
10 As we described earlier, the next steps
11 are that we complete a comment period on EPA's
12 proposal, hear what the community has to say tonight
13 and then in writing and evaluate that against what
14 our proposal is, consult with the state and then EPA
15 selects a remedy.
16 And then there's some stages that
17 follow, Natalie described them in some detail, and
18 maybe we can get into that a little bit more in
19 comments or questions and I think it would be
20 appropriate to sort of switch to that part of the
21 meeting.
22 I'm going to, I think, put up this map
23 and maybe just leave it up for the time being because
24 there may be some questions.
25 We're going to now start -- actually,

1 Natalie, why don't you sort of set up the question
2 and answer part.
3 MS. LONEY: What I'll ask people to do
4 is just come up to the microphone, I didn't use it,
5 but I told you my kids think I'm loud anyway, so when
6 you want to ask your question, I'd just ask that you
7 come up to the microphone, state your name for the
8 record, ask your question and we'll address it
9 accordingly and spell your name as well.
10 A SPEAKER: Is this comment period as
11 well or it's just questions?
12 MS. LONEY: You can -- you can ask a
13 question, you can make a comment.
14 A SPEAKER: On both sides?
15 MR. PRINCE: Oh, yes.
16 MS. LONEY: Yes, on both -- everything
17 that was presented tonight, both the Welsbach/General
18 Gas Mantle Site and the Martin Aaron Site, you can
19 ask questions and/or make comments.
20 MR. PRINCE: I would ask that you -- if
21 you have questions about both, that's fine, along
22 with stating your name and spelling your name for our
23 court reporter, if you could also identify to whom --
24 to which site the questions are identified for
25 because that will help us to -- in response.

1 MS. LONEY: Anyone?

2 MR. CHAPIN: My name is Richard Chapin,

3 C-h-a-p-i-n, I am president of Chapin Engineering, a

4 consulting environmental engineering firm on behalf

5 of EWA, an environmental advocacy group in New

6 Jersey, I have conducted a review of the proposed EPA

7 plan, the 25-pager.

8 I haven't looked at the feasibility

9 study in detail, so these comments are based on the

10 information that is presented in the plan. These are

11 down in writing, we will gladly give you a copy of

12 them by the end of the meeting and EWA will be glad

13 to transmit them to you. I will say that this was

14 written without knowledge of the thorium problem or

15 potential thorium problems, so there's probably going

16 to be some supplemental questions that will be put

17 forth.

18 The proposed plan talks about excavating

19 28,000 some cubic yards of contaminated soil.

20 Apparently, this plan is based on using 300 parts per

21 million of total arsenic as a cleanup goal to

22 distinguish site versus historic fill; is that

23 correct, because that was not clear?

24 MR. PRINCE: Yes, that is correct.

25 MR. CHAPIN: The historic fill -- the

1 document talks about historic fill, but it does not
2 identify with any specificity what that historic fill
3 is.
4 That's very important because in New
5 Jersey the definition of historic fill material is
6 very specific in the state's technical regulations
7 and it excludes ores and slags and other things from
8 processing of metals such as the chromium that's all
9 over Jersey City, such as the thorium slag and ores
10 that are down there, so can you tell me exactly what
11 the historic fill is?
12 MR. PRINCE: It appears to predate all
13 of the operations that we were evaluating. It's not
14 clear from the boring logs that it had, for instance,
15 a character of ores and it doesn't appear to meet
16 that particular exemption, it's also the subbase for
17 this whole area.
18 MR. CHAPIN: I understand that, but from
19 a technical point of view in the regulations whether
20 or not you can call it historic fill, meaning whether
21 or not the presumption of leaving it in place applies
22 depends on whether or not it's an ore based material
23 or not.
24 Is it coal ash? I mean you can identify
25 coal ash. Is there coal ash there?

1 MR. PRINCE: Well, there is -- there are
2 coal remnants on the facility that are
3 attributable -- clearly attributable to the operation
4 of, we think, the tannery because we have some old
5 figures, we have some sense of where coal was stored
6 and where some of these operations took place, it's a
7 fingerprint, though, of chemical contamination, it's
8 not necessarily attributable to coal ash as it -- you
9 know, the certain clinker of debris that came out of
10 a coal fire -- a coal fire of some sort.
11 MR. CHAPIN: So then the DEP has
12 approved the use of 300 ppm as a site specific
13 cleanup goal?
14 MR. PRINCE: DEP is evaluating -- still
15 evaluating the proposed plan.
16 MR. CHAPIN: Okay.
17 MR. PRINCE: And they are aware of our
18 assessment of all of the data that was collected in
19 this area and that we -- that we attempted to make --
20 to make a distinction between arsenic that -- where
21 it's questionable because there's -- there are hits
22 of arsenic greater than 20 parts per million in all
23 sorts of --
24 MR. CHAPIN: Everywhere.
25 MR. PRINCE: In all sorts of places in

1 our study footprint and it's our understanding that
2 that's not too surprising, so what we were seeking
3 was trying to find a pretty clear footprint of what
4 is clearly associated with the -- the operations that
5 took place here and what may be -- maybe is
6 associated with wherever the fill came from with
7 other operations and we -- EPA conservatively
8 identified that sort of cutoff at 300 parts per
9 million.
10 MR. CHAPIN: When do you expect the DEP
11 to get back to you on that 300 level because that's
12 astronomical compared to my experience in the State
13 of New Jersey?
14 The State of New Jersey currently uses
15 20 ppm as background, they're going to go down 8 in
16 the proposed things and your risk assessment says 1.6
17 is appropriate for an industrial commercial worker,
18 so 300 seems very high.
19 MR. PRINCE: Well, I don't want to --
20 MR. CHAPIN: And we don't have to debate
21 that here, you're right.
22 MR. PRINCE: I don't want to
23 misrepresent what the remedy calls for because we
24 are -- we, EPA, made a -- was trying to assess a
25 distinction between urban fill that is found in this

1 area not attributable necessarily to operations that
2 took place here and operations that clearly took
3 place here.
4 We, EPA, expects a capping type remedy
5 which is frequently used for levels of arsenic as
6 high as 300 parts per million as a way of assuring
7 that contact with elevated levels of arsenic
8 associated with this site and probably not. In this
9 general study area are -- are protected from direct
10 contact which is the threat that's posed by -- by
11 this -- by arsenic.
12 Now, we also concluded that it was just
13 inappropriate to leave these higher levels because
14 they were clearly associated with the facility and
15 because they are probably a source of this
16 groundwater problem.
17 MR. CHAPIN: How deep are these
18 excavations going to be?
19 MR. PRINCE: 6 to 8 feet apparently,
20 that's what we've seen so far.
21 MR. CHAPIN: To get to the 300?
22 MR. PRINCE: Yeah. It may be deeper in
23 some places.
24 MR. CHAPIN: I'll make an observation.
25 If you -- your report indicates that there will be a

1 five-year review on the protectiveness of any cap,
2 I'll just make an observation that New Jersey
3 regulations require a certification of institutional
4 engineering controls every two years.
5 MR. PRINCE: Well, there's a whole other
6 set of applicable state regulations that we also
7 support for this particular property and that's part
8 of -- that's actually part of this remedy as well.
9 It involves taking measures -- let's
10 assume that this facility is going to get reused and
11 that it's going to be a use that's a betterment for
12 the community, that's what -- certainly what I want.
13 Well, it's going to be in our proposal a
14 cap and that certainly is -- can't be the end of the
15 story because there has to be controls on a cap and
16 that's part of what DEP expects of sites that are
17 capped as well, that's what they're evaluating for --
18 as a remedy for this South Jersey Port Corporation
19 Site across the street where not only would you cap
20 it, but then there's expectations that the landowner
21 or a responsible party would set in place rules for
22 use of that land so that the cap wouldn't be
23 disturbed, so that it would get fixed if it ages and
24 so that the -- if there is some need to disturb the
25 cap for some site use reason that it's done in a

1 protective way and that's part of our expectations,
2 too.
3 MR. CHAPIN: Your Alternative S4, your
4 document says it's going to take five months to
5 complete and in that five months, you're going to
6 essentially get rid of 28,00 cubic yards of
7 contaminated soil.
8 Your Alternative S6 which essentially
9 seems to be the total removal option is going to take
10 away an additional 36,500 cubic yards of soil, but S6
11 is scheduled to take four years.
12 So you're saying you can take -- if
13 there's a total of 64,000 some cubic yards of
14 contaminated soil that has to be addressed, you're
15 saying that we can get rid of the first 28,000 yards
16 in five months and the second 36,000 yards is going
17 to take another three and a half years, that doesn't
18 make any sense, ladies and gentlemen, none
19 whatsoever, front the point of view from an effective
20 and efficient excavating contractor loading trucks,
21 it just don't make no sense, so I suggest that
22 something has to be looked at as a time frame.
23 MR. PRINCE: Okay. Thank you. I'm not
24 certain of -- I'm not certain of those time frames --
25 MR. CHAPIN: They're right in your

1 documents.

2 MR. PRINCE: That's fine. And we can

3 provide a -- obviously all of the -- all of the

4 comments and questions that get raised here, the EPA

5 doesn't just -- they don't just disappear, we record

6 them for reasons so that -- because we're -- we need

7 to know -- we want to make sure we have a record

8 later so that we can know how to and, in some cases,

9 who to respond to and then we also are obliged to

10 weigh those decisions against what our proposal was,

11 maybe finds errors, maybe make clarifications in --

12 prior to selecting a remedy, so there may be some --

13 there may be some mistake there.

14 I mean I would -- I would make an

15 observation that there is an active facility there

16 and some -- there's some contamination attributable

17 to that and so there may be some factors that --

18 MR. CHAPIN: Not three and a half years.

19 MR. PRINCE: Okay. Thank you.

20 MR. CHAPIN: I just don't believe it's

21 three and a half years. I don't think you meant for

22 it to be that difference because it doesn't make any

23 sense.

24 I also took a look at the difference in

25 the numbers between the costs between the -- and

1 there's a table in my comments, my alternative -- I
2 looked slowly at the capital costs, I do have
3 questions about your present worth value for one
4 thing, but I looked at the capital costs.
5 For your Alternative S4, you're going to
6 spend $6.4 million to take out 28,000 cubic yards or
7 $229 a yard as a rough unit cost.
8 For 6, you're -- for Alternative 6,
9 you're going to spend $8.3 million and take out
10 64,500 cubic yards which is a buck a hundred 29
11 dollars, maybe that's economy to scale or something
12 like that, but it's significantly different.
13 The more important unit numbers that I
14 took out were -- I made some assumptions about
15 construction time. For example, if you have a
16 five-month construction time for S4 and you allow two
17 weeks upfront for mobilization and two weeks at the
18 back end for mobilization, that leaves you four
19 months worth of on site digging time and at five days
20 a week, that's so many days of digging time, worked
21 out to 80, as a matter of fact.
22 If you divide 80 into the tonnage you're
23 going to remove, you wind up with 350 cubic yards a
24 day or nine big truck loads a day which is a
25 reasonable rate for excavation and removal of

1 contaminated soils in a dig and hole operation, my
2 experience it's very doable by a good contractor.
3 Unfortunately, if take the average -- if
4 you take the workdays that you're going to do that in
5 which is some 80 and you divide that into the $6.4
6 million, you come up with an average daily cost of
7 $80,000 which is fantastic. Now, whether or not
8 that's what you meant, I don't know, but that's what
9 it comes out to.
10 Looking over to the S6 alternative,
11 you're wind up working for some 940 days over the
12 entire period which averages out to 69 cubic yards a
13 day or 1.7 truck loads a day which is an extremely
14 inefficient and ineffective operation. The daily
15 number works out to $8,800 a day which is not an
16 unusual number for an excavation contractor.
17 The point I'm trying to make is that
18 there's fundamental things that seem to be assumed in
19 generating your costs that just don't make any sense
20 with a basic review of it which leads you -- leads me
21 to suspect or me to question whether or not the
22 whole -- you know, you maybe need to go back and take
23 a fundamental look at the assumptions in the
24 development of your alternatives for soil to see
25 where these things jive.

1 See, these things don't make sense
2 because to me, as someone who's been doing this for
3 29 some years, they don't make sense to me, they just
4 don't make sense and I don't know that you need to
5 comment one way or the other, rebuttal of that,
6 that's just my comment and, like I said, you'll have
7 a copy of this, I'll be glad to give it to you.
8 On the groundwater, couple of comments.
9 Very traditional pump and treat program was selected,
10 the plumb, as identified in your document, in the
11 upper 20 feet of the groundwater is some thousand
12 feet long and 600 feet wide.
13 As an observation to the southeast of
14 that site, that plumb flows under houses that are
15 currently residential, occupied.
16 And so I have to ask, has there been any
17 consideration been given to vapor intrusion in those
18 residential homes, yes or no, and then we can take it
19 from there?
20 MR. PRINCE: Yes, there has. There is
21 the possibility of that -- it could be -- it could be
22 a pathway, certainly a good reason to take an action.
23 MR. CHAPIN: Has anybody looked yet or
24 is that something that we're going to do during the
25 design phase?

1 MR. PRINCE: No, we haven't. We haven't
2 done that part of the study yet.
3 MR. CHAPIN: And it will be looked at in
4 the design phase to see how the specifics of the
5 system were put together and where extraction wells
6 are and all that good stuff?
7 MR. PRINCE: Yes. Michael, do you have
8 anything to add to that because I -- you know, this
9 is mentioned very briefly in the proposed plan.
10 Michael Sivak is our risk assessor and happens to
11 know a lot about vapor intrusion.
12 MR. SIVAK: Yeah, we're very familiar
13 with the concept of vapor intrusion. Thank you for
14 bringing that up, that is something that we discussed
15 to date. Right now, EPA will be looking at vapor
16 intrusion as we move forward. We have concentrations
17 of VOCs in the groundwater that we will be using
18 against EPA's process to evaluate the methods for
19 vapor intrusion and that's the process that we will
20 be using as we move forward.
21 MR. CHAPIN: So you're not planning, at
22 this time, to send anybody into the houses with a
23 sniffer just to make sure there's nothing going on in
24 the basement?
25 MR. SIVAK: Well, if you read EPA's

1 Vapor Intrusion Guidance, the draft 2002 version, it
2 suggests that you start sort of with a screen before
3 you go in and you do sampling inside and we're going
4 to be starting with that.
5 We're going to be looking to see what
6 data are necessary in order to evaluate this rather
7 than just immediately go into people's homes when we
8 don't necessarily know that there is a reason for
9 that.
10 There's a process of outline in the
11 Vapor Intrusion Guidance that suggests we start at
12 the very beginning of the process and move forward
13 through, we collect the data that helps to build the
14 case of suggesting that vapors are migrating from the
15 plumb upwards.
16 MR. CHAPIN: Okay. Thank you. Of
17 course, you've got no defined end point for your pump
18 and treat which is not unexpected because you never
19 do. You never know until you turn the pump on -- I
20 would love to have a copy of that figure, by the way.
21 You don't -- you never know until you turn it on.
22 In looking at your data, something
23 struck me immediately. You have Trichloroethylene
24 and Tetrachloroethylene in the ground --
25 MR. PRINCE: We do.

1 MR. CHAPIN: -- and you have it in the
2 groundwater. You also have cis-1,2 Dichloroethylene
3 and Vinyl Chloride which are biodegradation products
4 of those previous mentioned chlorinated solvents.
5 MR. PRINCE: That's true.
6 MR. CHAPIN: So you have active
7 biodegradation going on today and you have that in
8 the face of relatively high arsenic concentrations.
9 You -- arsenic is an inhibitory compound
10 to biological activity and you have activity going on
11 in the face of a relatively high concentration which
12 means you got some good tough biology down there
13 which, to my mind when I read that and I looked at
14 the fact that you were talking about $6.6 million for
15 groundwater treatment, I immediately questioned if
16 some sort of in-situ in place process such as
17 injection with a hydrogen release compound to
18 stimulate the anaerobic bacteria that degrade the
19 chlorinated had been considered because in most cases
20 that's markedly more cost effective and efficient
21 than a traditional pump and treat?
22 MR. PRINCE: We evaluated in the
23 feasibility study which I'm afraid you haven't --
24 MR. CHAPIN: I don't have the
25 feasibility study.

1 MR. PRINCE: Right.

2 MR. CHAPIN: I only have your summary

3 document and I readily admit that there may be

4 details there that I didn't look at, but did you look

5 at in-situ stimulation of the biology to get at it

6 that way?

7 MR. PRINCE: We looked at -- we did look

8 at some volatile -- some ways of addressing volatile

9 organics in the subsurface. It's possible that

10 the -- and this is discussed in some detail in the

11 proposed plan and in greater detail in the

12 feasibility study, it is possible that after the

13 source is removed, the volatile organics, because

14 there's a relatively high degree of natural

15 biodegradation that's ongoing, that the plume -- the

16 groundwater plume attributable to these VOCs may

17 degrade, to a great degree, on its own.

18 One of the factors that we were -- and

19 so, to some degree, the groundwater alternatives that

20 we centered on were those that we were confident

21 could do something about the arsenic.

22 So while the pumping is going to take

23 place generally in this area, we know that

24 biodegradation, this process of bugs or bacteria

25 that's naturally occurring in groundwater in many

1 places can have some actually beneficial effect on
2 the VOCs, it's not going to do anything about the
3 arsenic.
4 So while some of those alternatives
5 were -- were considered, we really focused more on
6 something that we knew could address the arsenic.
7 MR. CHAPIN: Well, sir, I submit to you
8 that the technical program to use in -- use
9 enhance -- you talked about natural attenuation, not
10 putting something down that's going to actively
11 aggressively go after the organics and I put forth to
12 you that I believe you should be looking at something
13 that does that coupled -- I'm not saying you
14 shouldn't be pumping to get the arsenic out of the
15 groundwater, it's probably needed.
16 But I'm saying you actually could couple
17 that in so that you're not pumping also for ten
18 years, that's something I believe you should be
19 taking a look at it, in my professional opinion, so
20 be it.
21 On that particular map, you show silt
22 and clay layers continuous across certain areas of
23 the site and how do you know that they are when you
24 don't have any borings in those locations?
25 If you go to the very deep one --

1 MR. PRINCE: Right.

2 MR. CHAPIN: -- how do you -- that deep

3 one there, go to the left of that in that upper zone,

4 upper, upper, yeah, that one, how do you know that's

5 continuos out there? And I say that because the

6 Potomac-Magothy aquifer is notorious for having holes

7 all over the place, notorious.

8 MR. PRINCE: There is -- there is -- I'm

9 not a geologist, but I'll do my best.

10 MR. CHAPIN: That's fine.

11 MR. PRINCE: The PRM aquifer has a

12 number of different units that are very well

13 understood and the Upper PRM which is generally

14 thought to be within the first hundred to a hundred

15 20 feet is very similar in character to what we found

16 when we put in most of our wells in this area.

17 We did put in some wells in what's

18 this -- what was clearly known to be what's called

19 the Middle PRM, this is actually the Upper Middle PRM

20 aquifer and, again, what we found is very consistent

21 with what one finds in -- in this aquifer and so to

22 some degree, this is based on wells that we have in

23 place and to some degree, it's based on knowledge of

24 the aquifer itself.

25 MR. CHAPIN: I have another question.

1 You show a line of volatiles here. This
2 contamination of volatiles has penetrated that layer.
3 It's not a hole and it penetrated that layer. Now,
4 we all know the permeability of a clay to a
5 chlorinated solvent is not the same as its
6 permeability to a water.
7 And so if it penetrated this in here,
8 how do we know it didn't get below this one here?
9 MR. PRINCE: Well, aside from the fact
10 that we put wells in there?
11 MR. CHAPIN: No, you don't have a -- you
12 have a well down here.
13 MR. PRINCE: I'm sorry. This is a
14 cartoon, okay. This is a cartoon that shows an
15 example of where we put wells.
16 MR. CHAPIN: No, no. This is supposed
17 to be a geologic cross section that's supposed to
18 actively represent the boring lines, right? No?
19 MR. PRINCE: Fine.
20 MR. CHAPIN: I apologize for being
21 wrong. It's a cartoon.
22 MR. PRINCE: Right. I mean that's the
23 one way to describe it, yes. It's a depiction of the
24 site.
25 MR. CHAPIN: Why are we here talking

1 about a specific technical subject using cartoons?
2 Thank you for your time, I appreciate
3 it. I still want to know why this is here and I
4 would like to know how this stops here when you don't
5 have anything over here below it or you don't
6 indicate that you do?
7 MR. PRINCE: Thank you.
8 MR. ROBINSON: I'd just like to follow
9 up with one thing with respect to the radiological
10 work -- cleanup that we're doing is that when we find
11 thorium contamination on a property, we're removing
12 it down, we're removing all the contamination out,
13 we're not capping anything, we're removing all the
14 thorium.
15 Our cleanup is level is 5 picoCuries per
16 gram and that's for thorium and radium and we're
17 doing the sum of the ratios.
18 So we're taking the sums of the thorium
19 daughters and the radium daughters and our cleanup is
20 5. So if we find thorium contamination on a
21 property, we'll remove it.
22 MR. CHAPIN: Thank you. One last
23 question, has -- have any of the samples on the
24 Martin Aaronson [sic] property that we're talking
25 about here, not the one across the street where you

1 found it, any of the samples on that property been
2 tested for radiological?
3 MR. PRINCE: There's a screening process
4 that all sites go through the beginning of their --
5 when removal actions are started, so that's all the
6 way at the beginning, emergency response, that
7 involved a survey of this whole area, didn't find
8 anything.
9 There is one area that, in terms -- if
10 we're moving ahead with the remedy, there's one area
11 that actually may have some concerns of that nature
12 and it's -- it's this strange sort of property line
13 here there happened to be -- used to be a creek there
14 that is not as old as a lot of this other fill
15 material.
16 And the South Jersey Port, some of the
17 contamination that they found is actually sort of in
18 that same zone, so there's some possibility that, for
19 whatever reason, when that was filled in across the
20 street and there are a few hits of these thorium ores
21 that are found there, it's possible that there might
22 be something there, so --
23 MR. CHAPIN: Is there any place else on
24 the site where there's any radioactivity other than
25 that historic pre-cut? I understand that completely.

1 MR. PRINCE: I don't know that there's
2 anything there. There's no -- we didn't find
3 anything in the screening.
4 MR. CHAPIN: Did the screening that you
5 do consist of a paper study or was it walking the
6 ground --
7 MR. PRINCE: No, walking over the ground
8 surface and doing an evaluation.
9 MR. CHAPIN: And so in that line there,
10 there may be something of thorium at that border?
11 MR. PRINCE: It's possible.
12 MR. CHAPIN: It's possible. And would
13 that area be excavated as part of this remedy?
14 MR. PRINCE: Parts of it are --
15 MR. CHAPIN: It depended on whether it's
16 thorium there, is that going to be excavated in a
17 different way?
18 MR. PRINCE: Some of that area is part
19 of the area that is within this source area for a --
20 particular for arsenic, I believe, and that's sort of
21 right up against that property line and so we -- I
22 expect that in terms of the design of the remedy,
23 finding exactly where these cut lines would be and
24 then an excavation, we would answer some of those
25 questions.

1 MR. CHAPIN: Thank you.

2 MS. POMAR: Good evening, my name is

3 Olga Pomar, I'm an attorney at South Jersey Legal

4 Services, I'm here on behalf of two community groups,

5 South Camden Citizens in Action and the South Jersey

6 Environmental Justice Alliance and I have seven

7 issues that I'd like to briefly address, a few are

8 comments and a few are questions.

9 My first one is a question about the

10 funding. You know, I've been hearing for years that

11 the superfund program has basically no money

12 remaining, that there's a real crisis with that,

13 there's no -- there's little information about where

14 the money is going to come from and we've been

15 sitting with bated breathe waiting for cleanup for

16 three superfund sites that affect the City of Camden.

17 So is it now -- can you give us some

18 assurance that there is, in fact, funding to

19 remediate the site properly, is that money that's

20 already been set aside or are we still in the

21 pipeline?

22 MR. PRINCE: The monies themselves, just

23 as far as the whole process works, if it's an abandon

24 site and it needs to rely on federal funds and state

25 funds, the -- there's a second sort of step that

1 comes next which involves this remedial design which
2 is sort of like a construction project plans like you
3 were building something only we're sort of unbuilding
4 something and they're very detailed for safety and
5 sampling and various mechanisms for assuring that the
6 work is done safely.
7 And then there's part of it which is
8 simply the budgeting part, how much is it going to
9 cost and what sort of -- you know, what are the real
10 costs going to be for actually performing the real
11 nuts and bolts stuff.
12 It's at that stage, at the completion of
13 the remedial design, that -- when we know what the
14 costs are, not these sort of comparison type costs
15 that are in this feasibility study that we then
16 request to get on the pipeline, so that's -- we're
17 this -- for abandoned sites like, for instance, the
18 Welsbach Site and I think Rick can probably -- well,
19 you're really asking about Martin Aaron?
20 MS. POMAR: Yes, I'm asking about Martin
21 Aaron.
22 MR. PRINCE: Okay. The -- that's how
23 this mechanism works, so something like 18 months
24 after the record of decision would be signed for this
25 site, we'd be -- have those design documents in place

1 and we'd be ready to say, okay, Congress, we need
2 money, the state would go through a similar process
3 and we'd secure funds and -- and then are the -- you
4 know, for a site like that, are the funds secured.
5 At the time of a record of decision, no.
6 For this Martin Aaron Site, there are --
7 there are other ways that sites are cleaned up and
8 for -- for the Martin Aaron Site, EPA has identified
9 a number of companies that are, what we refer to, as
10 potentially responsible parties and they are
11 companies that worked with or had some sort of
12 business relationship with either Martin Aaron, Inc.
13 or some of the other drum reconditioning facilities
14 that operated out of that facility and EPA has
15 identified a group of them as this potentially
16 responsible parties.
17 What typically would happen in that case
18 is the EPA would turn to those parties and say, would
19 you -- would you like to perform the cleanup work
20 with EPA overseeing the work and then they'd be
21 paying for this design phase, get our approval in the
22 design that they're going to do it appropriately and
23 then they would subsequently oversee a cleanup.
24 There's some other ways, sort of other
25 ways that that can be done, but that is a phase that

1 we expect to come into play on this site.

2 There are some questions about the --

3 there's some liability questions, some issues that

4 need to be resolved before we reach that point, but

5 that's a stage at this site.

6 MS. POMAR: Well, let me just -- well,

7 is the companies that actually operated in Martin

8 Aaron, Martin Aaron company itself and Rhodes, I

9 assume they're like bankrupt, defunct, no longer in

10 existence?

11 MR. PRINCE: That's correct.

12 MS. POMAR: And have you had any

13 indication from these either potential responsible

14 parties how they're going to respond to this, whether

15 they're going to assume any responsibility or contest

16 responsibility?

17 MR. PRINCE: We have had some meetings

18 with a group that has formed, in response to EPA

19 sending out a number of these letters, and that group

20 is of -- you know, sort of still in the formative

21 stage and they're, I'm certain, going to evaluate our

22 remedy and provide comments.

23 And then there will be a point after

24 we've signed a record of decision where we will have

25 this document, this remedy, and at that point, we, in

1 essence, put it before them and say, hey, are you --
2 is this something that you are interested in
3 performing.
4 And just the way this process works,
5 groups like that tend to not form until there's
6 really sort of a concrete something for them to do,
7 so it's a little early for them to necessarily all be
8 together.
9 MS. POMAR: So basically we don't know
10 what their responsibility is going to be at this
11 point?
12 MR. PRINCE: No, we don't.
13 MS. POMAR: And is there funding within
14 the superfund program for whatever it is you guys
15 need to do to get to the record of decision stage?
16 MR. PRINCE: Yes. And if -- it's
17 possible that we will sit down with these companies
18 after the remedy is selected and we'll have
19 discussions that will, for various reasons, indicate
20 that we don't want them to do the work.
21 I mean some viable companies, they've
22 got money, they -- there's -- there are a number of
23 issues that need to be resolved, but EPA may conclude
24 that we want to do the design instead and at that --
25 and we would also be able to secure funding to do the

1 design which is the next -- sort of the next actual
2 physical phase of work.
3 MS. POMAR: So you say there is funding
4 to do the design?
5 MR. PRINCE: There will be -- there
6 would be if we chose to go that way, yes.
7 MS. POMAR: Okay. But what we don't
8 have is any -- you know, any definite prospect for
9 funding the actual remediation?
10 MR. PRINCE: Yes. If it needs to come
11 from the fund itself, it can't even get in line until
12 we reach that point where we have a complete design.
13 MS. POMAR: Okay. And do you know how
14 much money there is left in the superfund right now
15 nationwide to do any cleanup work? It's a negative
16 number probably.
17 MR. PRINCE: The funds that are
18 available for cleanups sort of come from two areas,
19 one is that there are settlements from sites that --
20 where EPA has -- you know, EPA has spent money in the
21 past, there are parties out there, we -- private
22 parties, we seek settlements, we get settlements and
23 that -- that money then goes back to be available for
24 spending at other sites.
25 MS. POMAR: But do you know if there is

1 any funds available now?

2 MR. PRINCE: And the other way that

3 funds are available for the superfund is that

4 Congress allocates a certain amount of money each

5 year and that amount of money has been fixed at

6 something -- I'm sorry. I'm not exactly sure,

7 something less than 200 million.

8 MR. ROBINSON: I think a hundred and 80

9 or so.

10 MR. PRINCE: A hundred and 80 million

11 per year for the past, I believe, three years for all

12 sites around the country.

13 MS. POMAR: Okay. Moving on. This I

14 know you've already covered in your presentation, but

15 I'd just like to note for the record that it's a

16 concern that you're separating the South Jersey Port

17 Corporation Site from the rest of this because I've

18 reviewed the Martin Aaron file the DEP had on -- you

19 know, in its document repository and it seemed like

20 early indications did show a connection, similar

21 types of contaminants and the common use of the site.

22 So if this gave an opportunity for us to

23 get the Port Corporation Site remediated, it's a

24 shame not to take advantage of that opportunity and,

25 you know, I'm not sure that what you found is so

1 conclusive that you couldn't make it part of the
2 site.
3 MR. PRINCE: Thank you.
4 MS. POMAR: My third comment is that --
5 I just want to note that, you know, now we have these
6 companies that are defunct and left this mess, but
7 unfortunately this was a mess a long time in the
8 making.
9 I mean they were -- looking again at the
10 DEP's files, they go back to 1972 and in 1981, there
11 were complaints and compliance orders by EPA because
12 of leaks on the site. Between '83 and '87, there
13 were 11 notices of violations issued, there were two
14 administrative orders and yet all of this time while
15 all this was going on and there were inspections,
16 there was soil samples, they found all this hazardous
17 stuff being dumped right on to the ground, but these
18 facilities just kept operating and operating and were
19 never closed down and I'm not aware of fines being
20 paid or any of these conditions remedied even though
21 this was right -- you know, every -- you know, people
22 at DEP and EPA were aware of what was going on.
23 My fourth issue was that we're very
24 concerned, and this probably goes to the heart of the
25 whole remediation plan, as to why you didn't consider

1 a proposal for full remediation that wouldn't require
2 capping and wouldn't require limiting this to
3 industrial use.
4 You know, Waterfront South has so many
5 contaminated sites, it is such an unfairly burdened
6 community and it is so inappropriate to keep,
7 quote/unquote, remediating sites by paving them and
8 leaving them and not having them be able to be fully
9 used because their use is limited to industrial use.
10 So I looked at your alternatives and S6,
11 as this gentleman pointed out, did allow for taking
12 out more soil than S4 which you chose. Obviously, I
13 think S6 is a better alternative than S4 because it's
14 more thorough remediation, but even S6 says that
15 you're still going to need to restrict use on this
16 property which suggests that even that alternative
17 doesn't totally take care of the problem.
18 And I noticed in your report that it
19 said, well, the city has no problem with it being
20 continued for industrial use, but that's not a
21 decision that residents in the community had input
22 on.
23 Waterfront South has 22 contaminated
24 sites that they're all paved over and all zoned for
25 industrial, that is -- you know, that's going to kill

1 this community. It's going to make it impossible for
2 people to continue living here with paved in
3 contaminated industrial sites, so we really think
4 that you should have considered that as an
5 alternative and evaluated that along with the other
6 alternatives.
7 Also, on your cleanup criteria, I guess
8 this is Point No. 5, we already talked about this 300
9 arsenic level, that seems very troubling knowing that
10 the New Jersey Non-residential Soil Cleanup Criteria
11 is only 20. I looked at your Table 1 which compares
12 the New Jersey Non-residential Soil Cleanup Criteria
13 to your source area cleanup goals and noticed that
14 arsenic, the New Jersey standard is 20, the DEP
15 direct contact standard is 1.6 and the source area is
16 300. I also noticed that Vinyl Chloride, the EPA
17 direct contact is .75, New Jersey Non-residential
18 soil Clean Up is 7 and you're proposing 10.
19 Now, from the perspective of the
20 community, you know, it really doesn't matter to us
21 whether it's historic fill, whether it got there from
22 the tannery, whether it got there from somewhere
23 else, if it's a health hazard, if it's contaminating
24 the groundwater, if it's not allowing full reuse of
25 the site, it's a problem and at the very least, it

1 should be cleaned up to appropriate standards whether
2 you characterize it as historic fill or not.
3 Next on the health assessment, I really
4 am not prepared to speak much on the health
5 assessment at this point, but I did notice that, as
6 usual, these health risks are evaluated in a vacuum
7 not considering the conditions of this community and
8 the people who live and work here because this area
9 is so contaminated, I mean we know it's go two
10 superfund sites, all these contaminated sites, three
11 major facilities, three Title 5 facilities and lots
12 of small sources of pollution.
13 So to do a health risk assessment that
14 only considers exposure from this one site really
15 doesn't take into consideration what the situation
16 here is in this community and, in general, as an
17 issue of Environmental Justice because this community
18 has been so unfairly burdened for so long, we think
19 that's all the more reason why you should impose the
20 most strict standards when you design a remediation
21 plan.
22 And finally my last point is on this
23 notion of the extension for comments. Yes, we do
24 want an extension to submit written comments, it's
25 not helpful for you to say you'll consider the

1 request and let us know by newspaper.

2 I mean we really need to know now

3 whether we need to try to get something to you by the

4 15th or whether we will have more time and if you

5 can't give us a decision tonight, we'd appreciate,

6 you know, letting the few of us who are here know

7 right away so that we don't have to check the

8 newspaper every day for the next month and not know

9 how much of a hurry we have to be in to get the

10 comments to you. Thank you.

11 MR. PRINCE: With regard to the

12 comments, we'll assure -- I assure you that we will

13 let -- I'm not sure how to do it, aside from the

14 newspaper, to make sure we cover everyone. We, for

15 instance, can --

16 MS. LONEY: If the comment period is, in

17 fact, extended, we do have the sign-in sheet and we

18 will either notify you by E-mail if you left your

19 E-mail address or we will mail -- mail some

20 information to you.

21 MS. POMAR: Okay.

22 MR. NOGAKI: My name is Roger Nogaki,

23 I'm from Evesham, New Jersey, I'm the chairman of the

24 Ellis Site Task Force Committee in Evesham Township,

25 it's a committee that was put together in 1983, there

1 were five local residents who were concerned about a
2 drum recycling superfund cleanup site in our
3 community very similar to what you have here.
4 And I want to tell you that I look at
5 your plans and I've heard your plans and all and it
6 has a striking similarity to some of the plans and
7 some of the presentations that were given to us back
8 in the early and mid '80s about cleanup at our site
9 and so I'd like to share some of my experiences with
10 this because I've been working with the -- with
11 representatives from the New Jersey Department of
12 Environmental Protection and members of the EPA on
13 just this subject, cleaning up this hazardous waste
14 site in our community, superfund site.
15 It also was an abandoned drum recycling
16 facility and I don't want to belabor a whole lot of
17 this, but there was a few things that I learned about
18 this whole process which I'd like to share with the
19 Camden community and I certainly extend my hope that,
20 you know, if you need some advice, those of you who
21 are from Camden, if you do form -- I would suggest
22 you do form a citizen's committee like we did in
23 Evesham Township, we got the backing of our local
24 mayor and council and have that backing for 22 years.
25 So I would say that, you know, this

1 township -- and it sounds -- it seems like Camden
2 City has some people who have essentially initiated
3 this process where citizens want to become involved
4 in what's happening in their community and I think as
5 the speaker before me mentioned that there's a
6 situation here where the people have an overburden of
7 industrial contaminants in their neighborhood that
8 affect their health and, you know, this neighborhood,
9 south Camden neighborhood, is really overburdened by
10 many, many different types of industries that are
11 affecting their health and these people are
12 battling -- I know personally people down here who
13 have died as a result of some of the contaminants
14 that they've been exposed to over the years and kids
15 are sick in this neighborhood.
16 I mean 25 to 35 percent of the children
17 in this area are sick with asthma. You know, I mean
18 these are things that are just unconscionable.
19 If it were in any other neighborhood, if
20 it was in Marlton, there would have been a hue and
21 cry by all the citizens in Marlton because, for the
22 most part, where -- you know, the educational level
23 is much higher than it is in this city, our health is
24 much better, we can spend the time to fight cleanup
25 situations like they have down here.

1 Maybe they don't have the resources down
2 here, but those of us who have gone through it are
3 certainly willing to come down and help them with
4 this.
5 And one of the things that I learned
6 about this process is, which is a great thing about
7 our democracy in this country, is that we, citizens,
8 have the right to question our government, you are
9 our government representatives and what we have found
10 is that in the beginning, the government is like --
11 like the father and we're going to tell you what has
12 to be done and how it's going to be done and just
13 trust me because, you know, we are educated in this
14 process, this is our job and we know how best to
15 handle the situation.
16 Well, it's not always true because in
17 our particular case, as an example, we put in a pump
18 and treat system over the objection of our local
19 citizen's group. The pump and treat system that was
20 designed to be put in there wouldn't work, it was an
21 old technology. I don't know what your pump and
22 treat system is going to be that you're proposing for
23 this site, but if it's the same old technology that
24 we had, it can go on for a hundred years, 200 years,
25 300 years, you're never going to clean up the

1 situation.

2 So what we did was we hired an

3 independent consultant who could advise us on the

4 quality of the engineering reports and such that were

5 brought to us by DEP and the EPA and, you know, it

6 really helped out because our group working, with the

7 government, has helped to really address the cleanup

8 and the efficiency of the cleanup.

9 Now, it's only been in the past ten

10 years that we've really been able to make substantial

11 strides in the cleanup of this site. We cleaned up

12 all of the ground contamination, all the soils that

13 were contaminated, all the heavy metals that were in

14 the soils, the hydrocarbons, all the VOC, everything

15 that was in the soil down to couple of feet was

16 removed from the site, so there's not any contaminant

17 left there.

18 Our big problem is in the groundwater.

19 Now, when you talk about the about PRM, the PRM for

20 South Jersey is the most important aquifer for

21 potable drinking water in our area and all of us

22 throughout South Jersey depend on the PRM. Almost

23 everybody in South Jersey depends on the PRM as their

24 major source of water. It is the major source of

25 water.

1 So when you talk about contamination
2 like this, eventually it's going to keep on spreading
3 and then all the other communities are going to have
4 to clean up their water.
5 Now, this community, Camden, already is
6 faced with groundwater contamination, their wells are
7 already contaminated, they've had to put filters on
8 and do some substantial cleanup. So I would say
9 that, you know, you should invite the local community
10 to sit down with you and go over what your plans are
11 for the cleanup in their community because it's their
12 community, it's their lives, it's their children,
13 it's their ability to function as a family unit
14 that -- that is most important and we're destroying
15 it down here in this community.
16 I mean this site here alone, this sewage
17 treatment plant which is, you know, considered to be
18 one of the most modern technically -- top of the
19 technical order sewage treatment plants, but I want
20 to tell you something, I've been down here at picnics
21 out here on the street here in this very community
22 and I want to tell you that the smell is so bad at
23 times you can't eat.
24 Now, these people who live down here, I
25 can go home and eat, but these people who live down

1 here they have to eat, too, and they have to eat
2 through the horrible smells that come from this
3 plant, so, you know, whatever we do, whatever you
4 plan to do, you should plan to invite the community
5 groups to work with you on the plan and not shove
6 down their throat, you know, what you consider to be
7 the right plan.
8 Now, your plans may be right, okay, they
9 may be right, but giving these folks an opportunity
10 to participate in that is most important and I think
11 that's what you have to consider.
12 And, you know, I don't know where your
13 office is, but we dealt a lot with -- I personally
14 have dealt a lot with the DEP over the years. I mean
15 I've been up there -- some years I've been up there
16 every month meeting with DEP people, I take time off
17 from my work, I go up there and I do battle with the
18 DEP folks, all right.
19 After we got over the hurdle of, you
20 know, I'm beating up on you or you're trying to hold
21 something back from me and we all started working
22 together, that's when we started finding new
23 technologies and we have introduced some new
24 technologies which we are now examining in
25 conjunction with DEP and the EPA representatives to

1 improve our water treatment system on our site and
2 we're not dumping one single drop of that water into
3 the municipal utility authority sewer systems, it's
4 going right back to that site and nothing that comes
5 off of this site that you treat should go into the
6 sewage treatment plant for Camden County Sewage
7 Treatment Facility here, should not go, should stay
8 right on the site, keep it there, use it to flush the
9 system and make sure you have a technology that's
10 going to meet the needs of your particular system.
11 Now, in our particular thing, we found
12 that -- we're looking at a dual face extraction
13 system which we feel will substantially upgrade the
14 pump and treat system that we currently have.
15 Now, there's a couple of other
16 technologies that we're also looking at for different
17 parts of this thing, our water treatment thing, so I
18 think that these are the kind of things you folks
19 ought to consider and I think it's very important to
20 include the community.
21 To cut the community out by saying, you
22 know, we're only going to give you a certain period
23 of time that you can have input into this record of
24 decision I think is wrong. I think the whole process
25 should include that. Thank you.

1 MR. PRINCE: Thank you.

2 MS. NOGAKI: My name is Jane Nogaki,

3 N-o-g-a-k-i, and I am secretary of the board of the

4 New Jersey Environmental Federation and I'm asking

5 some questions and making some comments tonight on

6 behalf of the New Jersey Environmental Federation,

7 it's the state's largest environmental organization,

8 we have 70,000 individual members and 100 member

9 groups.

10 We're also a member of the South Jersey

11 Environmental Justice Alliance and we share the

12 concerns that have been mentioned previously by Olga

13 Pomar on behalf of Camden residents.

14 As one of the groups who is active in

15 passage of the superfund act, the original intent of

16 the law, you know, back in the '80s was to get in, do

17 remedial actions, cleanup sites fast and make

18 polluters pay.

19 And one of the things that -- that

20 citizens pushed for in the law was cleanup that was

21 permeant, not containment, you know, but actual

22 physical removal or neutralization of contaminants to

23 health based standards and, again, making the

24 polluter pay.

25 The problem with the actual

1 implementation of the law is that too often cost and
2 responsibile party influence is making cleanups that
3 are basically caps and containments rather than
4 physical removal and this doesn't serve to protect
5 the health of the residents, it's basically a way to
6 leave contamination on site and we think it negates
7 the whole initial purpose of the law.
8 And the reason it does is that whatever
9 is left in the soil is going to continue to leach
10 down into groundwater whether it's historic fill, you
11 know, whether it's from a tannery, whether it's from
12 the drum recycling, that contaminated soil has to be
13 removed, all of it. That should be Soil Remediation
14 Remedy No. 7, okay, which doesn't appear in your
15 remedies, but that's the remedy we're suggesting.
16 Soil Remedy No, 7 would be cleaning up
17 all the contaminated soil at the site to what's
18 called residential standards, health based standards,
19 so that the site would be suitable for any use in the
20 future.
21 Why clean up a site halfway, you know,
22 to meet some kind of, you know, interim standard
23 when, really, you're only going to get one shot at a
24 cleanup, it should be done the right way to health
25 based standards so that this site is available for

1 any potential use, residential, recreational, school
2 or industrial.
3 And then I would also propose that there
4 be an additional Groundwater No. 6 added and that is
5 to clean up the groundwater to health based standards
6 to drinking water standards and that all the
7 groundwater be returned to the site.
8 Using the sewer system to remediate a
9 superfund site is unacceptable. You're basically
10 using dilution of a sewer system 80 million gallons a
11 day to dilute the contaminants to make them, you
12 know, meet some numerical standard at the end of the
13 pipe, but it doesn't really isolate those
14 contaminants, it just pushes them out through the
15 sewer system.
16 So, again, to repeat, Groundwater
17 Treatment No. 6 would be to clean up the groundwater
18 to drinking water standards and to return it to the
19 site, underneath the site.
20 One thing -- I happen to serve on the
21 same Ellis Site Task Force with Roger Nogaki and one
22 thing that happened at our site in Evesham was that
23 because it took so long to get through remedial
24 design, record of decision and the construction
25 design, it was over ten years before the soil was

1 cleaned up at the site which meant that the plume of
2 groundwater contamination got much larger and much
3 more contaminated.
4 The course of action was to do the soil
5 cleanup first as one operable unit and then the
6 groundwater contamination subsequent to that and the
7 problem with that is that the groundwater got much
8 worse and went much further off site and so I would
9 recommend that this groundwater situation be
10 addressed immediately because a thousand feet of
11 plume in five years from now and ten years from now
12 is not going to be a thousand feet of plume, it could
13 be 5,000 feet of plume. I don't know, you know, how
14 fast this has migrated at what rate, but it's not
15 going to stay that way, it's going to get larger, so
16 if there isn't any immediate action to contain that
17 plume, it's only going to spread.
18 And, again, I would reiterate the point
19 that the Edison Wetlands Associates' technical
20 consultant made is that the vapor intrusion that
21 could be occurring right now to people that live
22 adjacent to that area could be threatening their
23 health and that, I consider, an eminent hazard.
24 I think that the necessary screening,
25 whether it's soil screening on a right of way in

1 front of someone's house, if that's the mechanism to
2 evaluate that, that should be done immediately.
3 You know, part of the goal of superfund
4 was to take these emergency remedial actions to
5 prevent eminent hazard to health and I think that
6 groundwater plume going off site poses an immediate
7 risk to health.
8 I want to ask a question. You talked
9 about radionuclides at the site being screened for,
10 were they actually analyzed for in groundwater,
11 radionuclides? Was there an analysis of
12 radionuclides done -- I mean groundwater at this --
13 the site I'm referring to is the Martin Aaron?
14 MR. ROBINSON: Well, when EPA did its
15 groundwater investigation as part of the remedial
16 investigation for the Welsbach Site back in the late
17 1990s, we took a number of groundwater samples from
18 the Martin Aaron Property.
19 The wells -- the Martin Aaron wells were
20 in place at that time and we sampled them as part of
21 the Welsbach Site and we found no radiological
22 contamination in the groundwater.
23 MS. NOGAKI: You didn't find any or it
24 was below increments of drinking --
25 MR. ROBINSON: I don't recall off the

1 top of my head, but they were below drinking water
2 standards and I believe -- I'm not -- of all the
3 samples we sampled, the only contamination that we
4 found in the groundwater was immediately adjacent to
5 the main sources -- source areas such as the General
6 Gas Mantle building in Camden and the Welsbach
7 Facility in Gloucester City and some of the dump
8 areas in Gloucester City.
9 MS. NOGAKI: Okay. Thank you.
10 MR. PRINCE: And we can make that data
11 available to you.
12 MS. NOGAKI: Okay. And I'm just
13 wondering, you know, back then, were you using that
14 48-hour gross alpha turnaround time test, were you
15 screening -- analyzing within 48 hours for gross
16 alpha?
17 MR. ROBINSON: I'd have to go back and
18 look at the results. Off the top of my head, I don't
19 know, but whatever the protocols were at the time, it
20 was approximately 1998, so if those procedures were
21 in place, then we followed them.
22 MS. NOGAKI: And, again, I would just
23 reemphasize that the off site contamination that goes
24 underneath the Port facility is probably evidence
25 that there is enough soil contamination on the Port

1 facility to warrant a cleanup there as well,
2 especially when you say that the direction of the
3 groundwater flow is going from north to southeast and
4 you can see that the plume actually begins over on
5 that site or do you think that that's --
6 MR. PRINCE: This picture is sort of
7 strong for purposes of presentation here, but there
8 are other monitoring wells that are placed on that
9 property and this -- these plumes that we've found
10 here were not found over there. Now, it doesn't mean
11 that every well --
12 MS. NOGAKI: Now, you don't think that
13 there's any contribution at all from the South Jersey
14 Port Facility located across the street toward that
15 groundwater flow?
16 MR. PRINCE: In terms of groundwater
17 contamination, the well -- the well data doesn't
18 support that -- that assertion, no.
19 MS. NOGAKI: Okay. So, again, just to
20 conclude that the emergent -- the long emergence of
21 this superfund site here 20 years after its initial
22 investigation cries out for an immediate action at
23 this site and I know that superfund sites tend to
24 take a really long time even when they get started
25 into the pipeline, but I think more remedial action

1 needs to be taken at this site because, otherwise,
2 you know, millions of dollars will be spent on a
3 design and a construction plan and the length of time
4 that passes before, you know, a shovel going in the
5 ground to remove contaminated soil or a pump and
6 treat system starting to pull back a plume is going
7 to be, you know, ten years from now and that is just
8 simply unacceptable in a community that has, you
9 know, high cancer rates for lung cancer, high asthma
10 rates, contaminated drinking water problem, high lead
11 in the soil in all the residential and industrial
12 areas, it's completely overburdened and the superfund
13 program is one chance to start to make those remedies
14 happen and it should happen here and it should happen
15 soon. Thank you.
16 MR. PRINCE: I'd like to respond to a
17 couple of points, if I may. One of the items that
18 we're -- we -- who are working on this evaluation in
19 this particular site have struggled with is -- is
20 attempting to sort out what is related to a superfund
21 problem and what is not and -- so it's not that we're
22 looking at the site in the vacuum of only looking at
23 what the releases are, but to some degree that's
24 what's expected of the superfund problem -- program,
25 it's not meant to solve problems that aren't

1 attributable to particular uncontrolled releases that
2 are identified as -- and in this case, they are the
3 tannery operation and -- and the subsequent drum
4 reconditioning operation.
5 So EPA's proposed remedy is trying to
6 strike a balance between a protective remedy that
7 does a complete solution for what's clearly
8 associated with the releases and then a remedy that
9 is, frankly, pretty common in many parts of the New
10 Jersey and across the country for levels of
11 contamination that are, while unacceptable for direct
12 contact, can be addressed through some sort of a
13 capping or reuse plan, some sort of facility even
14 if -- sort of a park like facility that just has a
15 barrier between whatever residues are left and
16 what -- and where people are actually going to be
17 functioning and to the degree that -- I don't want
18 you to think that we are evaluating this site in a
19 vacuum, we have met with interested groups in the
20 community, we have met with the city and it's pretty
21 clear that the plan for this particular property is a
22 commercial type or light industrial type reuse and --
23 so some of the assumptions that then follow on in
24 this process are based on that starting point, they
25 aren't based on a starting point of, well, this is

1 expected to be a pristine residential type
2 uncontrolled use type setting at the end of the day.
3 MS. NOGAKI: Well, we just disagree on
4 that philosophy of what the cleanup should be and as
5 I said from the start, environmental advocacy groups,
6 citizen groups felt that there shouldn't be a
7 bifurcated standard of cleanup based on future use,
8 that the cleanup should be, you know, to the best
9 cleanup standard, the health based standard that
10 would allow unrestricted use, you know, that that
11 should be the standard of cleanup because you don't
12 know what the future use of a property is going to
13 be, you know, it might be industrial use tomorrow,
14 but, you know, six months or a year from then, there
15 might be a decision to say, you know what, let's put
16 some residential units here or we need this for a
17 school site or let's make it a park or instead of a
18 farmer's market, how about a real farm in Camden.
19 You shouldn't condition, you know, the
20 future use of a site based on some prospect of a
21 business arrangement and, you know, a future buyer
22 when, you know, a cleanup is really forever, it
23 should be forever, it should be unrestricted, it
24 should allow any future possible use and that's --
25 you know, that's the philosophical difference that we

1 have here, but I really feel that it was the intent
2 in the original law --
3 MR. PRINCE: And you -- well, you have
4 that philosophical difference with the law as it's
5 written, though. I mean I will -- I will disagree
6 with you to -- well, philosophically I might agree
7 with you. I would disagree with you that the content
8 of superfund law as written is that EPA evaluates
9 what the future land uses are expected to be based on
10 consulting the owner, in this case, that's not really
11 relevant, but the -- in particular, the city in this
12 case who is -- has a planning process, this parcel is
13 in that planning process and I'm not certain there's
14 really much disagreement in the sort of larger scale,
15 sort of master plan scale while there may be
16 disagreements about other lots in Waterfront South, I
17 don't think there's much disagreement about the
18 planned future use of this particular formerly
19 industrial expected to future be non-residential type
20 use for this particular property and that's a very
21 important -- in fact, integral part of EPA's analysis
22 of the site.
23 I would also like to --
24 MS. NOGAKI: Well, I think it's just
25 cost driven. You know, it's going to be a cheaper

1 cleanup. You know, the future use of the site -- you
2 know, it's just like why wouldn't EPA want to go for
3 the best possible cleanup, it's cost, you know, and I
4 recognize, yes, cost is one of the, you know, things
5 that you have to look at, but say that that's, you
6 know, what it is, don't pretend that it's, you know,
7 because of some, you know, economic development, it's
8 a matter of cost.
9 MR. PRINCE: Well, as I say, we can
10 disagree about the content of the law, but we're --
11 there's a process that EPA is obliged to follow in
12 evaluating sites and I would contend that that's the
13 process that we're going through here.
14 MS. NOGAKI: Well, there's also a part
15 in the law that says community acceptance of a remedy
16 is an important --
17 MR. PRINCE: Absolutely.
18 MS. NOGAKI: -- strategy as well.
19 MR. PRINCE: Absolutely.
20 I would also like to mention with regard
21 to your comments that you had observed that it was
22 a -- it was necessary that EPA approach the
23 groundwater as if the goal were to clean it all up
24 and -- and to reach drinking water standards for this
25 area that's contaminated.

1 And I would like to reiterate that the
2 area that's contaminated is known and it's not being
3 used, so that's a piece of good news.
4 The age of the plume is such that we
5 believe that it is, in essence, at its size and that
6 it's -- apparently the levels at the furthest most
7 point are very close to drinking water standards
8 already and we think that it's, in essence, in a
9 decay for the VOCs as it leaves the site.
10 Be that as it may, EPA is proposing a
11 remedy that attempts to meet groundwater standards
12 throughout this zone and what you are objecting to,
13 in particular, is that the process that we are
14 proposing is that once we pull it out of the ground,
15 we do some sort of treatment to meet a standard that
16 is set by the municipal sewage authority and then
17 discharges into their system because they would
18 accept it and we did look at some of the other
19 alternatives, we did look at methods of -- I think
20 someone -- it may have been you who mentioned sort of
21 flushing --
22 MS. NOGAKI: Reinjection.
23 MR. PRINCE: A reinjection and there are
24 a number of factors that make that pretty hard to do
25 here. I'm -- we weren't confident that it would be

1 successful, so it's not that we didn't look at it,
2 it's that given the local conditions, it seemed like
3 there -- it might fail as a method of disposing of
4 this treated water, so it's not -- we did evaluate
5 that and the alternative that we -- we recommended
6 another approach because it seemed much more likely
7 to succeed.
8 MS. NOGAKI: Was there anything else?
9 MR. PRINCE: No. Thank you.
10 MS. PFEIFFER: My name is Barbara
11 Pfeiffer, P-f-e-i-f-f-e-r, and I am a resident and
12 this is a lot to understand, I would just hope that
13 you could extend the public comment period. There
14 are many residents in Waterfront South, so I hope you
15 don't only consider the commercial value of what
16 you're doing -- what you're doing because the
17 residents, even though you say the site is going to
18 be commercial, from what I understand, it affects
19 residents, too, so I just -- there are many people
20 interested, there are many people who care about the
21 residents of Waterfront South and not just the money
22 that's going to come from the commercial properties,
23 people have lived here all their lives for
24 generations and -- so I do just -- I don't see why
25 you could not extend the public comment period so

1 that we can really have a lot of input. There are a
2 lot of people interested.
3 MR. PRINCE: EPA frequently extends
4 public comment period as much -- public comment
5 periods as much as 30 days, so that would be a 60-day
6 public comment period into, I guess, middle of
7 September and the type of response that we hear at
8 meetings like this is obviously a major influence
9 and, unfortunately, it's not specifically my decision
10 to make, but we will certainly resolve that and based
11 on experience at other sites, I would expect that we
12 probably will extend it.
13 MR. JONES: My name is Roy Jones,
14 coordinator of the South Jersey Environmental Justice
15 Alliance and -- I just had some dental work so you
16 might have to tolerate me.
17 I have some questions. One, who are
18 some of the responsibile parties?
19 MR. PRINCE: You know, could I provide a
20 list to you separate from this meeting just because I
21 don't have it.
22 MR. JONES: Okay. And the second
23 question is, there was a number of violations really
24 starting from 1972 and then it just went completely
25 ridiculous between '83 and '87 which is about --

1 well, from '83 to 1998 which is about 15 years of
2 violations. You cited them, right --
3 MR. PRINCE: EPA.
4 MR. JONES: -- and yet the company was
5 not shut down, could you explain why not?
6 MR. PRINCE: I'm afraid that I can't
7 explain that, in part, because they were cited under
8 a program called RCRA (phonetic) that deals with
9 operating facilities and the primary -- the primary
10 jurisdiction for RCRA happens -- is typically the
11 state and most of the -- most of the violations were
12 cited by the state.
13 I can -- I can clarify what the process
14 was back then in written responses, but I don't
15 really have the details of sort of the sequence of
16 events tonight.
17 MR. JONES: And you said there were some
18 interested groups that you met with in the city, now
19 who were they?
20 MR. PRINCE: Well, obviously, we've met
21 with the city, we've met with Heart of Camden, we've
22 met with -- what other groups have we met with?
23 MS. LONEY: I can't remember.
24 MR. PRINCE: Sorry. Waterfront South,
25 we met with some representatives from Waterfront

1 South.

2 Now, there is a science advisory board

3 that's associated with Waterfront South and we

4 actually tried to meet with them over the past couple

5 of weeks and we haven't been successful, and doing

6 that just because of the timing, and we would

7 actually welcome the opportunity to meet with that

8 group, in part, because they have certain expertise

9 that they can bring to environmental issues and a

10 certain sort of knowledge that maybe others in the

11 community wouldn't have and it might be useful for us

12 to speak with them.

13 A member of EPA, a Dave Rossoff

14 (phonetic) who is here tonight is a member of that

15 science advisory board and, unfortunately, it just --

16 the timing of schedules hasn't worked out so that

17 we've been able to meet before them, but we would

18 welcome that opportunity if it could be made to work.

19 MR. JONES: Well, I do have a point.

20 I'm not certain you're aware that in this city, you

21 can be -- you can be cited for a parking ticket for

22 $17. If you just don't happen to pay for it within a

23 certain period, you'll get a warrant. And if it

24 didn't go to your right address, then the police

25 could pick you up and lock you up for a $17 parking

1 ticket.

2 And yet you had this company for years

3 violating the law, no one was arrested, you don't

4 really have a serious record of fining this company

5 and then at the end of the day, today, nearly

6 30 years later, you tell us that we're going to

7 meet -- in terms of the cleanup standard, we're going

8 to do really what amounts to minimal cleanup

9 standards.

10 And I would suggest to that -- to you is

11 this, people are affected in this city every day, in

12 particular this community, you should clean this site

13 up to the highest standard, you owe that to the

14 people in this community.

15 People are locked up and penalized for

16 welfare fraud for trying to get an extra dollar for

17 food stamps and you allowed this corporate predator

18 to destroy this community. At the end of the day, no

19 one was ever penalized in any real way because of

20 this.

21 And now we hear today that how you're

22 going to clean this site up really is going to be at

23 a minimal level, so my point to you is that you owe

24 the people of this community, in particular Camden,

25 at least the cleanup of this site at the highest

1 possible standard and we would like to know and
2 expose these responsible parties that have been
3 hiding behind the law and hiding behind the EPA and
4 DEP professionalism or lack of it and destroying this
5 minority community.
6 So at the end of the day, you should
7 clean this site up at the highest possible standard,
8 that's my point, because they violated the law, you
9 allowed them to skate -- escape any penalty and then
10 today many people here are sick and the after affects
11 of this site will continue for the next 30 or 40
12 years.
13 So the idea that you met with the city
14 when the city now is engaged in a wholesale of
15 displacement of hundreds of people, you really should
16 listen to the citizens is my point.
17 And finally, I do want a list of the
18 responsible parties because my group will be a part
19 of, at least, exposing these people for what happened
20 in this neighborhood. Thank you.
21 MR. PRINCE: Thank you.
22 MR. LYONS: My name is Charles Lyons,
23 L-y-o-n-s, I'm chief of planning for the City of
24 Camden. I have met with EPA staff both on this
25 project, the Martin Aaron project, as well as the

1 Welsbach.

2 I have essentially one question and four

3 comments. My first question, I was out in the

4 hallway talking with Andy Krick (phonetic) and so I

5 missed the part about what's happening in Camden

6 regarding the Welsbach Gas Mantle Site. What is the

7 remedy?

8 MR. ROBINSON: This is the remedy for

9 the groundwater -- not the groundwater, for the

10 surface water sediment wetland areas that are

11 adjacent to the Welsbach contaminated property and we

12 found no radiological contamination in the water

13 bodies, and, therefore, we're proposing no remedial

14 action.

15 MR. LYONS: Okay. But previously EPA

16 Region 2, under the superfund program, demolished the

17 Welsbach Factory and covered the site with gravel.

18 MR. ROBINSON: That's the General Gas

19 Mantle Facility on South 4th Street?

20 MR. LYONS: Right.

21 MR. ROBINSON: Yes.

22 MR. LYONS: Is that the extent of the

23 action that you're going to take to clean that site?

24 MR. ROBINSON: No.

25 MR. LYONS: Okay.

1 MR. ROBINSON: We're going to be
2 removing all of the radiological contamination from
3 that property, we have a design in place and we're
4 awaiting federal funding for that work.
5 MR. LYONS: Okay. Thank you. That's
6 what I needed to know.
7 MR. ROBINSON: Okay.
8 MR. LYONS: Regarding the Martin Aaron
9 Site, based on what I've heard this evening, there is
10 an obvious need to continue the evaluation of the
11 scientific remedies for cleaning up the site.
12 I would agree that full cleanup is the
13 goal, should be the goal for this as any other
14 contaminated site which bears such close proximity to
15 people working and living in this community and not
16 being a scientist, I have no way of evaluating
17 whether one solution is better than another, but
18 there seems to be -- seems to have been enough
19 discussion tonight that opens the door to more
20 evaluation of what is a better remedy.
21 As obvious is the need to extend the
22 public comment period, and I understand from your
23 response is that that's likely to happen, so we
24 welcome, you know, more time for people to take in
25 the information and to respond accordingly.

1 Environmental justice is the hallmark of
2 what the City of Camden's concern is for this
3 community and has been since we first started the
4 Waterfront South Environmental Planning Task Force
5 back in 1999. We want to emphasize that in this
6 particular case, environmental justice equals
7 environmental health.
8 This is, as it's been said time and time
9 again, a severely impacted community that has a wide
10 range of health threatening, if not life threatening
11 illnesses directly responsible from the environment,
12 so we would like to see more done to address the
13 people at the same time as you're addressing what to
14 do with contaminated property.
15 I believe a more comprehensive, as
16 Ms. Pomar pointed out in her comments, to talk about
17 environmental health as it applies to one side and
18 not take into consideration that there are 15 other
19 contaminated sites in this one neighborhood misses
20 the point.
21 We have to look at the cumulative affect
22 of what's going on with Gas Mantle, with Martin
23 Aaron, with the highway, Camden Iron and Metal, so
24 forth and so on and I believe because of initiatives
25 taken by New Jersey Department of Environmental

1 Protection an opportunity has presented itself for at
2 least the last 12 months to address environmental
3 health issues from an inner agency standpoint and I
4 would invite EPA to work very closely with DEP and
5 the city and the Camden County Department of Health
6 in looking at a way to accurately assess the
7 environmental impact on people's health here and then
8 devise sort some of remedy.
9 Regarding the site reuse for Martin
10 Aaron. The Waterfront South Redevelopment Plan calls
11 for that site to be reused for commercial. This is
12 in keeping with the fact that Broadway is one of the
13 most significant commercial corridors in the City of
14 Camden as well as Camden County.
15 While we are aware that Comarco Port
16 Products is looking to expand and that would be the
17 only industrial use, I would envision, encroaching on
18 this site, we were proposing a farmer's market
19 primarily so that we would get to the most stringent
20 levels of cleanup to adequately protect food and
21 people on the site.
22 So while we do not envision that this
23 will ever be housing, we believe cleaning this site
24 properly will allow a neighborhood commercial
25 enterprise that will serve the residents to flourish.

1 And finally, the City of Camden joins
2 with all other environmental justice, environmental
3 health advocates to call for a full and effective
4 partnership of community, government and businesses
5 such as task forces that we've already established
6 and that have been suggested by the gentleman from
7 Evesham Township to have a full and effective
8 partnership and do this project to improve the
9 quality of life in Waterfront South which, to us, is
10 the goal. It is not important to fix the blame. It
11 is more important to fix the problem.
12 MR. SPIEGEL: My name is Bob Spiegel,
13 I'm the executive director of EWA, we're a nonprofit
14 advocacy group based in Central New Jersey. And this
15 was the first time I actually looked at the second
16 cleanup plan for the Gas Mantle Company and I had a
17 couple of questions and then a couple of concerns.
18 The first question really revolves
19 around Page No. 5 where you talk about the potential
20 contaminants of concerns that were evaluated and
21 maybe you can clarify the fact that you evaluated
22 certain radiological contaminants in the wetland
23 areas as part of this evaluation and then looked at
24 the risk posed by those contaminants.
25 MR. ROBINSON: Yes.

1 MR. SPIEGEL: And did you find any site
2 related radiological contaminates in the wetlands or
3 in the stream?
4 MR. ROBINSON: No.
5 MR. SPIEGEL: No.
6 MR. ROBINSON: All the levels were at
7 background levels.
8 MR. SPIEGEL: Okay. Because it says
9 that later on that you subtracted the background
10 levels from what was found to calculate the risk?
11 MR. ROBINSON: Correct.
12 MR. SPIEGEL: So were there anything
13 besides background levels there?
14 MR. ROBINSON: When you look at
15 radionuclides, it's not -- the background is a range
16 of background, so you have a range ranging from less
17 than a picoCuries per gram up to a couple of
18 picoCuries per gram and what you do is you take a
19 number of samples and you take a statistical --
20 perform a statistical analysis on that data and you
21 come up with a median or mean number and that's the
22 number you use as a background number and then we
23 take that number and we subtract that number from a
24 general sample and to see what that number comes out
25 to be. Sometimes it's negative, sometimes it's

1 positive.

2 MR. SPIEGEL: So did you find levels of

3 radiologicals in the wetlands or in that area that

4 were consistent with what you considered to be

5 backgrounds levels?

6 MR. ROBINSON: Correct. Background

7 levels, yes.

8 MR. SPIEGEL: So you did find -- so you

9 did find radiologicals there, but you considered them

10 to be background levels or below background because

11 you subtracted out the background levels -- what you

12 considered to be background levels from that?

13 MR. ROBINSON: Yes.

14 MR. SPIEGEL: And then it says that you

15 had a variety of non-site related contaminants,

16 arsenic, lead, benzo(a)pyrene, PAHs, pesticides -- a

17 number of different pesticides, PCBs, those were all

18 additionally found in the sediments in the creek?

19 MR. ROBINSON: Yes, the Delaware River

20 and Newton Creek.

21 MR. SPIEGEL: Okay. And that was based

22 on data collected by EPA?

23 MR. ROBINSON: Yeah, as part of our

24 analysis, we did a -- we did a -- both chemical and

25 radiological sampling.

1 MR. SPIEGEL: And if you were -- so you
2 did this analysis as part of your characterization of
3 the work that you were doing at the site, but your
4 goal was to identify radiological contamination at
5 the site which is the only thing you're going to be
6 responsible for addressing?
7 MR. ROBINSON: Yeah. What we did is
8 when you -- we had a superfund site on the land
9 portion, we wanted to see if that contamination made
10 it into the water bodies and then when we do an
11 evaluation of the water bodies, it's EPA's policy to
12 look at all chemicals of concern.
13 And right now -- when we did this study,
14 we didn't know if there was radiological
15 contamination in that water body and after the study,
16 we found that there was no radiologicals, we did find
17 the chemical contamination in the water bodies,
18 however because there is no RAD in the water bodies,
19 then the water bodies are not part of the superfund
20 site.
21 MR. SPIEGEL: Well, you did find
22 radiation, but you considered that radiation to be
23 background --
24 MR. ROBINSON: Background levels.
25 MR. SPIEGEL: -- levels?

1 MR. ROBINSON: Yes.

2 MR. SPIEGEL: So you looked -- and the

3 risk assessor, maybe he can touch upon it if he's

4 still around.

5 MR. ROBINSON: No, Michael wasn't the

6 risk assessor for the Welsbach Site, but I have

7 someone who -- here who can help on some of those --

8 MR. SPIEGEL: Okay. Well, I'm trying to

9 understand how the risk was calculated and why there

10 was no action, why no action was being proposed for

11 that site.

12 So you separated out the

13 non-radiological contamination when you did your risk

14 assessment, you separated out the background levels

15 of radiation that you found where you considered to

16 be background and then taking what's left, you

17 calculated out the risk for that site, the

18 wetlands -- the surface water, is that the correct

19 methodology that you used?

20 MR. ROBINSON: Mike, do you want to come

21 up? This is Mike Barone with Malcolm Kierney

22 (phonetic) and Malcolm Kierney was the company that

23 did the remedial investigation for us for this

24 operable unit and Mike is the risk assessor for

25 Malcolm Kierney and he can go over the background on

1 that.

2 MR. BARONE: Basically, for the

3 radiological contamination, we estimated risks due to

4 natural background which we identified at these areas

5 here, we came up with that risk. Then we took our

6 samples that were collected throughout the water

7 bodies and also estimated those risks. We found that

8 those risks were identical to risk due to natural

9 background, however we also subtracted out natural

10 background from our samples to come up with the net

11 risk.

12 MR. SPIEGEL: And the areas that you

13 sampled to get natural background, how did those

14 levels compare with like another area farther outside

15 Camden, are those above what they consider to be --

16 were those consistent with, let's say, other areas

17 like Princeton or --

18 MR. ROBINSON: They were similar -- the

19 background levels that we found in our

20 radiological -- our radiological background samples

21 that we collected in those five areas were basically

22 identical to the statewide averages, so it was really

23 no different.

24 MR. SPIEGEL: So there wasn't any spikes

25 higher or lower?

1 MR. ROBINSON: Within the range of
2 background, they were all within that same range.
3 MR. SPIEGEL: What, you added them all
4 up and then divided by five, is --
5 MR. ROBINSON: Well, it depends on --
6 no, there was more than that many samples. It's --
7 we had to take a number of samples to give us a 95
8 percent confidence limit so that we're -- we -- that
9 the number is a valid number.
10 MR. SPIEGEL: If you took the -- the
11 numbers that you found in the sediments in the
12 surface water, the total number of samples, and you
13 added in all those other chemicals that were non-site
14 related that you sampled for, but had no intentions
15 of, I guess, cleaning up as part of this cleanup,
16 would this site -- would these wetlands present a
17 risk to human health and the environment?
18 MR. ROBINSON: If you look at the risk
19 assessment report, it did indicate that there were
20 unacceptable risks in the surface water bodies for
21 the chemicals of concern other than the -- excluding
22 the RAD.
23 So the RAD showed no risk, however the
24 chemicals -- the PCBs were the primary contaminant of
25 concern that did have a -- show of risk.

1 MR. SPIEGEL: And -- but the -- normally
2 you're saying that the background wouldn't present a
3 risk, but in -- if you took the background levels
4 that were present and added that to the chemical
5 contaminants, would that increase the risk at all in
6 any substantial way? I'm just trying to understand
7 your process because --
8 MR. ROBINSON: I know where you -- you
9 want to say for the synergistic effect --
10 MR. SPIEGEL: Is there any increase in
11 risk above background, that's basically what I'd like
12 to find out?
13 MR. ROBINSON: The risk with the
14 chemicals of concern, mostly the PCBs, were -- what's
15 the best way -- you want to -- I'm not a risk
16 assessor, so that's why I'm -- a risk assessor who
17 did our risk assessment --
18 MR. SPIEGEL: I'm not either, but I play
19 one on TV.
20 MR. ROBINSON: Our risk assessor didn't
21 show -- wasn't able to make it tonight, so she's the
22 one who usually answers those questions.
23 MR. BARONE: We didn't find any risks
24 associated with any of the RAD samples that we
25 collected, so if you take those risks and you add

1 them to any risk that you had from chemicals,
2 non-radiological chemicals, they wouldn't increase
3 the risks, the total risks.
4 MR. SPIEGEL: So it wouldn't increase it
5 at all if one does not impact the other?
6 MR. BARONE: That's correct.
7 MR. SPIEGEL: And did you -- were you
8 able to locate the sources of those non-site related
9 contaminants?
10 MR. ROBINSON: No, it's basically
11 ubiquitous throughout the water bodies.
12 MR. SPIEGEL: But there was no --
13 nothing in proximity to the location that --
14 MR. ROBINSON: Not that we could find.
15 Basically, as part of our investigation work, you
16 know, we determined that -- we were informed that
17 there's a "do not eat fish" advisory for the Delaware
18 River and the water bodies adjacent to the site
19 properties and the primary level -- contaminate of
20 concern that's driving that "do not eat fish"
21 advisory is PCBs.
22 So the State of New Jersey actually
23 right now is -- has a -- is starting to look at the
24 issues and there's a representative here who can talk
25 to you after the meeting about that.

1 MR. SPIEGEL: Okay. Well, just that
2 some of the language you use in your proposed plan
3 kind of maybe is technically accurate, but does not
4 give you, I guess, the proper information like when
5 you talk about your contaminates of concern at the
6 very end, it says that, in general, the area
7 surrounding the site includes historic and current
8 manufacturing facilities that used a variety of
9 chemicals that were not in use or available when
10 Welsh [sic] made gas mantles and this supports EPA's
11 conclusion that the non-radiological chemicals are
12 not related to the Welch Site.
13 MR. ROBINSON: The Welsbach.
14 MR. SPIEGEL: I'm sorry. The Welsbach
15 Site.
16 When -- as far as I know, lead has been
17 around for a very, very long time and arsenic has
18 been around for quite sometime as well and so, again,
19 you know, the wording of this is kind of a little
20 deceiving because it leaves one to the conclusion
21 that, you know, that these are definitely not site
22 related and these chemicals, you know, just weren't
23 around at the time that this site was in operation.
24 MR. ROBINSON: Generally, the primary
25 chemical contaminant of concern, again, is the PCBs

1 and the PCBs came into wide use well after Welsbach
2 went out -- Welsbach and General Gas Mantle went out
3 of business.
4 MR. SPIEGEL: Sure. But that's the way
5 it should be reflected, not just lumping all the
6 chemicals into that category.
7 Speaking on the Martin Aaron Site, there
8 was number of technical comments made by Rich Chapin
9 that reflected EWA's position on the cleanup, and I
10 only have to two to add. One is I think the EPA
11 needs to immediately screen the residential homes for
12 vapor intrusion.
13 As we know in Endicott, New York and
14 other locations throughout the country, vapor
15 intrusion is now looked -- being looked at as a
16 significant exposure pathway for public health and to
17 wait until the data shows eminent harm or that the
18 potential for eminent harm may be exposing these
19 residents to additional insults that they're already
20 experiencing, so that's the first thing.
21 I'd like to know what goes into getting
22 that evaluation, getting the Tagget trailer
23 (phonetic) from the EPA to come up here from Edison
24 to do a quick evaluation, is that something that can
25 be done in an expedited way?

1 MR. SPIVAK: Perhaps, I wasn't very
2 clear in my earlier response and I apologize for
3 that. EPA has looked at the issue of volatiles in
4 the groundwater at this site, so I don't want anyone
5 in the audience to think that we're not taking this
6 issue very seriously. EPA is committed to looking at
7 vapor intrusion at this site as well as all of our
8 sites, so that's the first issue is that you need to
9 recognize that we are looking at it, okay.
10 We have started looking at the vapor
11 intrusion investigation of this site by looking at
12 where the highest concentrations of VOCs were. We
13 don't immediately go out and start sampling homes, we
14 look to see where is our plume, where are the highest
15 concentrations of contaminants in our plume, where
16 are those highest concentrations relative to occupied
17 buildings, residential buildings, commercial
18 buildings, what is the likelihood that the vapor
19 intrusion phenomenon or that fate and transport
20 pathway is going to occur at these sites, we've
21 already started looking at that.
22 We recognize that the highest
23 concentrations in VOCs in the groundwater at this
24 site in the shallow Upper PRM are concentrated in the
25 center of the site where there are no buildings

1 currently in existence.

2 We do recognize that there are occupied

3 structures, occupied homes at the southern portion of

4 this property, but that the wells in that area are

5 not indicating concentrations anywhere near what

6 we're seeing in the primary source area for VOCs.

7 We are evaluating this, we recognize

8 that it's not -- the concentrations that we're seeing

9 in the plume as it extends down in that area are

10 nowhere near as high as what we're seeing at the

11 source area, we will be looking at that in the

12 future, there is not an immediate threat to public

13 health in the environment from the vapor intrusion

14 pathway and that needs to be made clear. You --

15 MR. SPIEGEL: Is that based on a

16 numerical risk assessment?

17 MR. SPIVAK: It's based on screening the

18 data that we have right now for the Upper PRM.

19 MR. SPIEGEL: Okay. So it's based on

20 basically numerical, not actually any data collected

21 from --

22 MR. SPIVAK: We have not collected soil

23 gas data. Any soil gas data that we get would

24 volatilize from the groundwater, so we're looking at

25 the primary source of the contamination which is the

1 groundwater to figure out is this an immediate
2 threat, can we deal with -- do you we need to deal
3 with it right away or can we sort of roll it out as
4 we do the subsequent investigations or additional
5 investigations so that we're getting kind of the best
6 data that we can get.
7 At this point it's not appropriate to
8 or -- to get to Tagget unit out there as you suggest
9 to go into these homes and look for alternate sources
10 of --
11 MR. SPIEGEL: So looking at EPA's
12 cartoon up there, how would you say that the -- you
13 know, that adequately reflects, in other words, the
14 level of -- to the ground water at the -- where the
15 residential homes are?
16 MR. SPIVAK: Okay. I'm a risk assessor,
17 so this is a really, really bad diagram for me to
18 look off of. I look at the one -- I look at the maps
19 where it shows the plumes and the contours and the
20 concentrations that we're seeing in the wells
21 relative to the occupied structures and based on
22 that, we compare those concentrations to EPA's Vapor
23 Intrusion Guidance, the screening levels that are
24 presented in there, we apply our judgment regarding
25 fate and transport mechanisms associated with the

1 subsurface geology at this particular site, we look
2 at the types of structures we're dealing with, we
3 look at the levels of VOCs in the groundwater and we
4 draw our conclusions based on that.
5 MR. SPIEGEL: And what are you using for
6 your risk based model, what number?
7 MR. SPIVAK: We're using the
8 concentrations that are presented in EPA's Draft
9 Vapor Intrusion Guidance, the November 2002 document.
10 MR. SPIEGEL: The concentration is
11 .0 -- what is the concentration being used for in
12 comparison for the risk assessment?
13 MR. SPIVAK: For what chemical are
14 you --
15 MR. SPIEGEL: For the volatiles.
16 MR. SPIVAK: Every VOC would have its
17 own chemical specific screening value.
18 MR. SPIEGEL: Well, TCE is the one
19 you're looking at, right?
20 MR. SPIVAK: Well, there are a number of
21 VOCs here at this site, but we do have TCE at this
22 site. The 10 to the -6 concentration for TCE in
23 indoor air would be 0.016 micrograms per cubic meter,
24 the upper bound of that risk range would be 1.6
25 micrograms per cubic meter, but those are indoor air

1 concentrations. We don't have indoor air
2 concentrations, we have groundwater concentrations,
3 so we'd have to back calculate that.
4 The numbers that are in the Vapor
5 Intrusion Guidance at the 10 to -6 number, the policy
6 is MCL at 5 micrograms per cubic meter. We do exceed
7 that we are at about 11 micrograms per cubic meter at
8 our maximum detected concentration, I believe, of TCE
9 in groundwater, I think that it was 11.
10 MR. SPIEGEL: So it's in the upper
11 boundaries of that?
12 MR. SPIVAK: That's the 10 to the -6
13 range, we have a risk range of 10 to the -6 --
14 MR. SPIEGEL: 10 to the -4.
15 MR. SPIVAK: -- to 10 to the -4, right,
16 so we are certainly within that range.
17 MR. SPIEGEL: Okay. And does that -- do
18 you factor in also that the air quality radius is
19 poor here and that this may be exacerbated by the
20 fact that, you know, generally speaking, the air
21 quality around here is really not good to begin with?
22 MR. SPIVAK: Yeah, that's a really,
23 really tough issue and I think John talked about that
24 a little bit earlier. Unfortunately, when we look at
25 superfund sites, we look at site related

1 contamination. We look at all the contamination
2 that's out there, but we focus our risks on our site
3 related contaminants and, you know, that's the way --
4 that's the way that our process is, that's the way
5 that the law is structured. I mean we could debate
6 that, but that's the way that the law is structured.
7 MR. SPIEGEL: So it's everything
8 operates in a vacuum, so to speak?
9 MR. SPIVAK: We have a responsibility
10 under the superfund law to look at what are the risks
11 associated with the site contaminants now and in the
12 future if no remedial action occurs, that's how we
13 have to develop our risks, that's what we have to
14 look at under this approach.
15 Are there other risk paradines out there
16 that would allow more of a cumulative risk based
17 approach, yes, there are, EPA is working on a variety
18 of frameworks like that, but you also have to
19 understand that the superfund process is very -- is
20 very descriptive in what we look at and what we have
21 authority over and what we evaluate and those are
22 very different processes and you understand that, I
23 know you do, you understand that, and we're focused
24 on what we can look at.
25 MR. SPIEGEL: Okay. And my last comment

1 just is that I also agree with the other speakers
2 that came up here that the 300 number is excessive
3 for looking at the arsenic levels and I would suggest
4 that the community and the township fight tooth and
5 nail to -- and also the DEP to go for that 20 number
6 because if we start looking at sites and allow 300
7 ppm to be the standard, industry is going to say,
8 look at this, we should have 300, we should have 500,
9 the standards will just keep going up and up with the
10 cleanup.
11 The cleanup standard, I believe the
12 health based criteria for arsenic, is .6, if I'm
13 correct for the health based criteria, 20 was used
14 because it was an economic number, it used to be 2,
15 then it became 20, then 20 became the standard, but
16 it's not a health based number.
17 So now we're looking at having several
18 hundred parts per million be the number that's,
19 quote/unquote, acceptable and I would encourage DEP
20 and the residents and everybody to not accept that.
21 Thank you.
22 MR. PRINCE: Thank you.
23 (Brief recess was taken.)
24 MR. FRANCIS: My name is Kelly Francis,
25 I'm currently president of the Camden County Branch

1 of the NAACP, we are headquartered in the City of
2 Camden for the past 60 some years. I've been a
3 resident of Camden for -- since 1949. There's one
4 technical thing I want to clear up.
5 On page 11 of the Welsbach/General Gas
6 Mantle Contamination information sheet, page 11,
7 Study Area 3 geographically, is that in the right
8 location geographically for Study Area 3?
9 MR. ROBINSON: Study Area 3 is in
10 Gloucester City.
11 MR. FRANCIS: Okay.
12 MR. ROBINSON: And it's the area along
13 Essex Street, Essex Street and the railroad, and also
14 includes the -- a yard up on Broadway south of Newton
15 Creek. Here's Newton Creek. This is the line
16 between Camden -- the red line on the map is dividing
17 between Camden and Gloucester City. So Study Area 3
18 is in Gloucester City.
19 MR. FRANCIS: All right. But now on
20 page 11, you have it located in Camden, Study Area 3
21 located in Camden.
22 MR. ROBINSON: There's an arrow that, on
23 this map, doesn't quite point to Study Area 3.
24 There's a --
25 MR. FRANCIS: This is Camden, this is

1 the Morgan Village area.

2 MR. ROBINSON: There's an arrow that

3 didn't reproduce.

4 MR. FRANCIS: Oh, okay. All right. I

5 know that's the Morgan Village area. Okay. I just

6 wanted to be clear on that.

7 My comments are that I'm intimately

8 familiar with the General Gas Mantle Site because I

9 was a letter carrier in 19 -- up until 1970 and I

10 delivered mail to that facility at the time that it

11 was a sewing factory. I don't know the name -- I

12 can't recall the name of the --

13 MR. ROBINSON: Ste-Lar Textiles.

14 MR. FRANCIS: Ste-Lar Textiles it was.

15 Okay. It had several owners over the years, but

16 around 1970 when I concluded my service in the area,

17 there were dozens of women -- primarily women who

18 worked in that building and, of course, Arlington

19 Street adjacent to it was row homes on both sides of

20 the street, there were wall to wall row homes which I

21 delivered mail to up until 1970 and across the street

22 there was the old Howland Croft Mill (phonetic) which

23 had several sewing factories also, there was Sterling

24 Levitt (phonetic), Coleman Wraps (phonetic), Tiny

25 Women, they manufactured garments for females and

1 there were dozens -- maybe hundreds of women,
2 primarily women who worked in those factories as
3 seamstresses
4 So my concern is is has there ever been
5 any attempt to locate or identify many of the workers
6 who worked in those buildings and the residents who
7 lived in those homes because we're talking -- I don't
8 know how much longer the facility operated after 1970
9 because that's when I left the area as a letter
10 carrier.
11 But is that anyone's responsibility or is
12 that EPA's responsibility to try to locate or
13 identify those former residents and employees because
14 we're talking -- in my experience, we're talking
15 35 years ago and a lot of those people are still
16 alive today I'm sure, if they haven't deceased from
17 those related illnesses, but some attempt, I believe,
18 should be made to try to locate or identify those
19 persons and maybe some kind of a health screening or
20 testing to see if there have been any detrimental
21 affects to their health as a result of exposure to
22 the radioactive -- radioactivity in that area and
23 also this is a combined residential and industrial
24 commercial area, Broadway mostly commercial, west of
25 Broadway was mostly industrial

1 So my question is, is that anyone's
2 responsibility to identify and try to locate those
3 individuals for a potential health screening?
4 MR. ROBINSON: Well, at EPA, we're only
5 responsible for the cleaning up of the soils, not for
6 the prior studies. At part of EPA's evaluation early
7 on in the project, the Agency for Toxic Substances
8 and Disease Registry or ATSDR in working with the New
9 Jersey Department of Health and I guess now it's the
10 Department of Health and Human Services.
11 MR. PRINCE: Senior Services.
12 MR. ROBINSON: Senior Services. They
13 did a health assessment of both superfund sites --
14 sorry. The assessment of the Welsbach Site --
15 Welsbach factory area in Gloucester City and the
16 General Gas Mantle in Camden, as part of the Welsbach
17 Site, and they found that there was an increase risk
18 of cancer in the areas, but it was mainly related to
19 smoking, but they didn't go back looking at the
20 historic.
21 So the answer to your question, EPA does
22 not have the -- it's not our mission to go and do
23 those kinds of investigations. It would be through
24 the State Department of Health and Senior Services if
25 that were to take place.

1 MR. FRANCIS: And Health and Senior
2 Services. Okay. Also, incidentally, I'm also a
3 member of the Department of Environmental Protection,
4 the Environmental Justice Advisory Council here in
5 the State of New Jersey. Okay. Thank you very much.
6 MR. MONTAGUE: My name is Peter
7 Montague, M-o-n-t-a-g-u-e, I'm from New Brunswick,
8 New Jersey. The reason I'm concerned about this
9 site -- well, I'm with the New Jersey Environmental
10 Justice Alliance, I'm not representing them here
11 tonight, but I generally take an environmental
12 justice perspective on these issues and so there are
13 two reasons that I'm concerned about this site.
14 One is that it is clearly an
15 environmental injustice unfolding before our eyes in
16 this community with the cleanup of the Martin Aaron
17 Superfund Site and I'm concerned because every time
18 you cap a site with a little asphalt and walk away
19 from it leaving contamination in the ground, you
20 poison the future, you poison the future for
21 everybody and that's what's happening here today.
22 I have specific requests and I'm going
23 to run through these because it's late. One, please
24 put all the documents for this site on the worldwide
25 web, simply turn them in to PDF documents, scan them,

1 turn them into PDF and put them on the web so that
2 people in Oregon can look at what's happening here
3 and compare it to their site and see what kind of
4 cleanup is being achieved here.
5 My guess is that if this site were in
6 Princeton, New Jersey, we'd have a different cleanup
7 proposed. I don't know that for sure, but I'm
8 guessing.
9 And to be able to make those comparisons
10 as to what's happening in various kinds of
11 communities and with similar sites and what are the
12 remedies proposed is very important for citizens to
13 be able to learn what's the real basis on which
14 cleanup decisions are made.
15 Third, key information is missing, take
16 a look at the last sentence on the box on Page 7, it
17 just dribbles off into nothing. You can't get a real
18 understanding from the box on Page 7 as to what your
19 risk assessment method is. Key information is
20 missing in preparation for a public hearing.
21 Now, EPA has been conducting public
22 hearings since when, 1970, so we're 35 years into
23 knowing how to conduct public hearings and you have
24 arrows that don't reproduce, you have information
25 missing from some of the printed handouts, you have

1 acronyms that are used but are not explained in the
2 box on Page 6, it starts off NCP says.
3 Well, I've asked several people in the
4 audience, what is NCP, nobody here has a clue. So
5 you've used an acronym that means something to you,
6 it means nothing to your audience and yet you're
7 pretending to be holding a public information session
8 where you're informing the public and hearing back
9 from the public. You really need to focus on doing a
10 good job of public participation and this is not
11 evidence of a good job of public participation.
12 Fencing the site, what you call an
13 engineering control, I believe, does not keep
14 children out of a site. It invites children to climb
15 the fence and get in. We've known this for 25 years
16 from superfund sites.
17 Page 11 says that the site would have to
18 be reviewed every five years, but, you know, there
19 are people in Congress that don't want EPA to be --
20 even be around in five years, suppose those people
21 prevail. Who would have guessed ten years ago that
22 the City of Camden really wouldn't have a municipal
23 government anymore. The city is in arrears, it's
24 broke.
25 If you walk away from this site and it's

1 supposed to be reviewed every five years, who's going
2 to do that. You're making huge assumptions about the
3 social capacity of the system to care about these
4 things in the future. There's really only one way to
5 protect the future population that will be affected
6 by this site and that's to clean it up thoroughly
7 now. Any other remedy is a crap shoot. You're
8 pretending to know what's going to happen in the
9 future and you can't know what's going to happen in
10 the future.
11 Someone should explain at some point
12 what it means -- what the comment means on Page 5
13 that the groundwater at this site is being influenced
14 by the municipal wells. The groundwater at the site
15 is being influenced by municipal wells? They're, I
16 presume, sucking water toward them. That seems to be
17 an interesting -- a little tidbit that's not
18 explained in your -- in your handout.
19 I would say, again, that this site needs
20 to be cleaned up thoroughly and emphasize again that
21 this site needs to be cleaned up thoroughly. There
22 is no substitute for cleaning it up.
23 Now, why would this community not get
24 the best possible remedy. I don't really know, but I
25 do know from your own documents that trouble was

1 identified on this site in nineteen eighty -- at
2 least as early as 1981 and nothing was done about it.
3 In 1987, the presence of hazardous
4 waste, drums, sludge was identified and yet,
5 according to your documents, some of these drums
6 weren't even removed from the site until 2001, so
7 this site has been -- has been known to be
8 contaminated for at least 20 years and you've known
9 that there were drums on the site for at least
10 14 years and you've left it.
11 It appears that this is not a high
12 priority for government. It appears that somebody
13 doesn't really care about this site, so that, to me,
14 is sort of a default position that this site is a
15 place that you all don't really care about and if you
16 really do care about it, the burden is on you to show
17 that and giving it a second best cleanup will simply
18 confirm the suspicion that this is a community that's
19 been written off and that nobody cares about, but
20 that's what you propose.
21 As Jane Nogaki said, you don't even have
22 in your documents an option of real cleanup. You
23 obviously haven't even considered or put a price tag
24 on a true cleanup of this site that would not end
25 with some kind of a cap or engineering controls or

1 some -- putting some kind of a fence around it or a
2 layer of concrete to supposedly protect future
3 generations from the contaminants.
4 I suppose -- now, I'm guessing, but I
5 suppose you didn't want to do that because if you
6 proposed a real cleanup and put a dollar value on it
7 and then came back and said, well, we really can't
8 afford that, you'd be really saying to this
9 community, your health really isn't worth that much
10 money, we're just not going to spend the kind of
11 money that it would really take to clean this place
12 up and so you don't want to lay out the real option
13 of cleaning it up and so all you've given people is a
14 bunch of crummy options and say, we're going to pick
15 the second crummiest.
16 Tell people the truth, lay it out for
17 them. Tell them what it would really cost to clean
18 this thing up the way superfund back when it called
19 for permeant remedies back in the old days, what
20 would a permanent remedy at this site cost? A
21 permanent remedy is not a layer of asphalt.
22 Now, let's talk about your general --
23 your general risk assessment technique. I know we've
24 got at least two risk assessors in the room.
25 Now, we know that from your documents

1 that the site has antimony, arsenic, barium, cadmium,
2 chromium, lead, mercury, selenium and thallium in the
3 metals department, then you've got VOCs and there's
4 no great -- there's no list of VOCs, there's a very
5 short list, then you've got semi volatiles, then
6 you've got PAHs, then you've got mention of
7 pesticides and PCBs.
8 Now, your health risk assessments don't
9 take into consideration multiple stressors occurring
10 at the same time. The science can't support it.
11 There aren't even agreed upon protocols for assessing
12 the health consequences of exposure to nine or ten
13 metals plus an unknown number of pesticides plus
14 PCBs, plus PAHs.
15 The timing of exposure in the
16 development of an organism is critical, as we know,
17 for understanding the toxicity. If a person is
18 exposed in the womb through something that their
19 mother does and that happens to be the week when
20 their eyes are developing, maybe they'll be born with
21 a cataract or maybe they'll be born with some vision
22 problem and if you expose that mother and that fetus
23 two weeks later, you might see a different affect or
24 no affect at all.
25 Politics can enter into quantitative

1 risk assessment. The first administrator of EPA,
2 William Ruckleshouse said in 1984, we should remember
3 that risk assessment data can be like the captured
4 spy. If you torture it long enough, it will tell you
5 anything you want to know.
6 Now, I don't want to accuse anybody of
7 torturing the data to reach a preordained conclusion,
8 but since you didn't even put out the best most
9 expensive option of total cleanup, we know that
10 you're playing with the data to some extent, you're
11 allowing money or something else to influence what
12 you will tell this community is possible.
13 So I'm wondering if somebody somewhere
14 hasn't allowed politics or money to enter into their
15 assessment of what should be done in this community.
16 Maybe this is a community that doesn't matter, maybe
17 this is a community that can be written off, maybe if
18 we did these same risk assessments in Princeton or
19 Upper Saddle River, we'd reach a different conclusion
20 about what needed to be done and what was possible
21 and how much money we should spend as a society to
22 preserve the health and integrity of those
23 communities.
24 The results of quantitative risk
25 assessment are not reproducible from laboratory to

1 laboratory or from risk assessor to risk assessor.
2 The National Academy of Sciences said in 1991, risk
3 assessment techniques are highly speculative and
4 almost all rely on multiple assumptions of fact, some
5 of which are entirely untestable.
6 So risk assessment is really kind of
7 bogus. It doesn't take into consideration multiple
8 exposures, different people can reach different
9 conclusions, there's lots of judgment involved. It's
10 not really scientific, it's an art, it's a political
11 art and yet you are presenting it to this community
12 as our risk assessment shows that this will be
13 protective of public health.
14 Well, pardon my french but that's
15 bullshit. You don't know what's protective of public
16 health except to not expose people to toxic
17 materials. If you don't expose people to toxic
18 materials, you can say that you will not be
19 influencing their health by exposure to toxic
20 materials.
21 I noticed in your presentation that you
22 used the word low levels. Well, when a person is
23 exposed to TCE and thallium and PCBs and mercury and
24 lead, you don't know what's a low level of TCE
25 because you don't know what's a biologically

1 effective level of TCE and that would be low.

2 If it weren't biologically effective and

3 you knew that for sure, you could justify calling it

4 a low level, but you don't know what's a biologically

5 effective level for a fetus whose mother is already

6 under stress because she's living next to a sewage

7 treatment plant, a garbage incinerator, other

8 superfund sites, a cement plant.

9 You don't know what's a low level, you

10 don't know what's a biologically ineffective level

11 and yet you use that language as if you did know and

12 that's misleading. You should just say we don't know

13 what -- we don't know. You should be honest.

14 There's a lot of talk about cancer here

15 and then there's a lot of talk about non-cancer

16 affects, but you don't know very much about

17 non-cancer affects. You don't even have -- in most

18 cases, you don't even have protocols for determining

19 what will cause a non-cancer affect.

20 For example, reproductive affects,

21 affects on a person's metabolism, affects on a

22 person's immune system, affects on a person's nervous

23 system, affects on a person's hormone system or

24 endocrine system, affects on growth and development

25 and affects on a person's behavior.

1 You don't even have protocols for
2 determining toxic affects that lead to behavioral
3 changes, so you've left them out of the risk
4 assessment, they're not in there, but we know that
5 lead by itself causes behavioral changes, it causes
6 people to become aggressive and nasty and maybe even
7 violent. Is there any aggressive, nasty, violent
8 behavior in Camden? I wonder if lead from this site
9 might induce more of it.
10 So you really have an obligation to
11 clean up this site, there's no reason not to unless
12 this community isn't worth it. And if this community
13 isn't worth it, just say so. Just tell the community
14 what the deal is, they can take it, they understand.
15 Thank you very much.
16 MR. PRINCE: Thank you, Mr. Montague.
17 Would you like me to respond to some of that?
18 MR. MONTAGUE: You could respond in
19 writing. The community would love to hear it.
20 MR. PRINCE: We will. Thank you.
21 MS. PIERSON: Helene Pierson,
22 P-i-e-r-s-o-n, Heart of Camden. I just wanted to say
23 for the record that we appreciate that the EPA at the
24 Heart of Camden's request has thus far participated
25 in really, our focus, on air quality, there's lots of

1 problems in the neighborhood, and that in those
2 discussions we periodically ask for updates on what's
3 going on with the superfund sites and we get some
4 comments on where you are.
5 But I want to -- I want the record to be
6 clear that our meetings have not been about the
7 Martin Aaron Superfund Site and, therefore, please
8 let the record be clear that you have not worked with
9 the Heart of Camden with regard to future use of the
10 site or cleanup methodology.
11 Government entities have twisted our
12 discussions in the past. We encourage and would host
13 more community dialogue on this specific topic and,
14 of course, support the community's request for an
15 extension of the comment period. Thank you.
16 MR. CARRINGTON: Theodore Carrington,
17 C-a-r-r-i-n-g-t-o-n, I guess -- I haven't been
18 appointed, but I'm here as part of the Central Jersey
19 Environmental Justice Alliance and I want to just
20 echo a little bit what was said by Mr. Lyons and
21 Mr. Jones about the health of the citizens that
22 are -- that live adjacent to this site and although
23 you said EPA does not really talk about doing health
24 screenings, but it's certainly within your purview to
25 recommend and I certainly would like for EPA to go on

1 record to recommend that those people who live in
2 this area who have been surrounded by all the sites
3 that Mr. Montague mentioned and countless others here
4 today have mentioned that -- that their health has
5 certainly been affected and -- or let's find out if
6 it has been affected by all of these sites.
7 I mean some of these toxics that have
8 been in the ground, airborne, dust down in the water
9 levels, so, you know, the citizens of the South
10 Camden should be -- have their health checked and
11 find out the amount of contamination within their
12 systems and I certainly, again, would like to see
13 this Regional 2 group make that as a strong
14 recommendation and there's no way to determine what
15 the health affects are unless there's a real
16 comprehensive health screening of all the citizens
17 that live in this area and even as Mr. Kelly said,
18 for those people who are formally in this area
19 because the health affects are probably tremendous.
20 And also I'd like to go on record also
21 to say that because this is the summertime and it's
22 hard to get people together to extend the public
23 comment period. Thank you.
24 MR. PRINCE: Thank you. I think we may
25 have reached the end of our meeting. I'll stay a

1 couple of extra minutes. The comment period
2 information on the extension will be forthcoming and
3 we really appreciate you all taking some time this
4 evening.
5 This is -- this is a lot of very
6 difficult information, it's hard work for us to try
7 and present it, it's hard to absorb and appreciate
8 that you've all stayed for the whole time to try --
9 to try and understand these two sites. Good night.
10 (Meeting concluded at 10:26 p.m.)
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1 C E R T I F I C A T E.

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4 I, Stacy A. Shuchman, a Notary Public and
5 Certified Shorthand Reporter of the State of New
6 Jersey, and Commissioner of Deeds for the
7 Commonwealth of Pennsylvania, do hereby certify that
8 the foregoing is a true and accurate transcript of
9 the testimony as taken stenographically by and before
10 me at the time, place and on the date hereinbefore
11 set forth.
12 I do further certify that I am neither a
13 relative nor employee nor attorney nor counsel of any
14 of the parties to this action, and that I am neither
15 a relative nor employee of such attorney or counsel
16 and that I am not financially interested in this
17 action.
18
19
20 _____
Stacy A. Shuchman, C.S.R.
21 Notary Public, State of New Jersey
My Commission Expires September 5, 2006
22 Certificate No. XI 02034
23
24
25

1 C E R T I F I C A T E

2

3

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5 Certified Shorthand Reporter of the State of New
6 Jersey, and Commissioner of Deeds for the
7 Commonwealth of Pennsylvania, do hereby certify that
8 that the foregoing is a true and accurate transcript
9 of the testimony as taken stenographically by and
10 before me at the time, place and on the date
11 hereinbefore set forth.
12 I do further certify that I am neither a
13 relative nor employee nor attorney nor counsel of any
14 of the parties to this action, and that I am neither
15 a relative nor employee of such attorney or counsel
16 and that I am not financially interested in this
17 action.

18

19

20 Stacy A. Shuchman, C.S.R.
21 Notary Public, State of New Jersey
My Commission Expires September 5, 2006
22 Certificate No. XI 02034

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Attachment D

EWA

September 7, 2005

Mark Austin
Remedial Project Manager
U.S. EPA
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: Martin Aaron Superfund Site
Comments for the Proposed Remediation

Dear Mr. Austin:

Attached please find a memo prepared by Chapin Engineering on behalf of Edison Wetlands Association. The comments are based on EPA's report "Superfund Program Proposed Plan" dated July 2005, and the public meeting we attended on July 26, 2005.

Edison Wetlands Association recommends/requests the following:

- EPA should reconsider choosing alternative S4 in favor of alternative S6. Mr. Chapin brings up the discrepancy in cost for executing soil remediation S4 vs. S6. The basis for selecting the appropriate clean-up method is clearly flawed. Alternative S6, which calls for complete removal of contaminated soil, should be selected.
- EPA should consider innovative approaches to groundwater cleanup. Methods suggested by Mr. Chapin such as enhanced biodegradation should be studied and proposed as a viable alternative.
- EWA requests EPA to clarify the nature of the historic fill on the site. Without confirming the exact nature of the fill, the 300 ppm goal for arsenic is unjustified.

As a non-profit organization advocating for environmental justice and proper cleanup of contaminated sites throughout New Jersey, Edison Wetlands Association is deeply concerned by EPA's weak remediation plan and its potential impact on the community of Camden.

Sincerely,

Robert Spiegel
Executive Director

Edison Wetlands Association, Inc. ♦ 2003 State Hwy. 27 ♦ Edison, New Jersey 08817
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CHAPIN ENGINEERING

A PROFESSIONAL CORPORATION
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R.W. Chapin, P.E.
President

AMENDED MEMO

TO: Bob Spiegel, Edison Wetlands Association
FROM: R.W. Chapin, P.E.
DATE: Prepared 07/25/05, *with additions 08/31/05*
RE: Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

The Martin Aaron Superfund Site is a 2.4-acre parcel located in Camden, NJ. The USEPA issued its summary (the "EPA Summary") of the preferred alternative for addressing contaminated soils and groundwater at the site, including a rationale for its selections. This memo provides comments on the EPA Summary document, which is 25 pages in length and includes three figures and two tables.

I attended the USEPA the July 26, 2005 Public Meeting on their preferred plans for remediation of soil and groundwater. A copy of this Memo was provided to the USEPA at that time. Based on information provided at that meeting, additional comments are appropriate. This Amended Memo provides those comments. These additional comments are presented in bold, italic type. This amended memo should also be sent to EPA.

Soil Cleanup

The selected alternative for soil remediation, designated S4, specifies removal with off-site transport and disposal of 28,000 cubic yards (CY) of soils contaminated with volatile organics and Arsenic from "sources areas" of the site. A source area is a location where soil contaminants are currently contributing to the groundwater contamination. This represents no more than 0.4 acres (17%) of the site. The balance of the site, approximately 2.0 acres, "...where the soils exceed the Direct Contact Cleanup Goals...", would be capped (the type of cap was not specified, but asphalt was assumed for estimating costs). Comparison to Alternative S6 (the total removal option) indicates 36,500 CY of contaminated soils will remain. A Deed Notice is required for the capped area because in-place contaminants will be at levels that will not allow for future unlimited use.

EPA developed direct-contact Cleanup Goals for site contaminants including Arsenic, which is a driving soil cleanup for a portion of the site. These Cleanup Goals include a limit of 300 ppm (parts per million) for Arsenic as a source area Cleanup Goal. The 300 ppm Goal is based on an assessment of site data and history that concluded Arsenic concentrations of 300 ppm or less are due to "historic fill" at the site and in the surrounding area. No discussion is provided to define that type(s) and characteristics of the materials designated as "historic fill".

Historic fill has the following definition in New Jersey. "Historic fill material means non-indigenous material, deposited to raise the topographic elevation of a site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement, and includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid wastes. Historic fill material does not include any material which is substantially chromate production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings. In addition, fill material does not include a municipal solid waste landfill site." (see N.J.A.C. 7:26E-1.8) Removal of Historic Fill is not required, although and institutional and engineering controls are required for sites having Historic Fill Material.

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AMENDED MEMO

TO: Bob Spiegel
FROM: R.W. Chapin, P.E.
DATE: Prepared 07/25/05, *with additions 08/31/05*
Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

The nature and characteristics of the historic fill underlying the Martin Aaron Superfund Site is critical to evaluating the acceptability of the proposed alternative, S4. Arsenic is a known component of lead ores. A lead smelter operated on the adjacent site east of Sixth Street. Arsenic is attributed to the former tannery operations at the site, but were smelter wastes, which are not, by definition, Historic Fill Material disposed at the site? If so, the presumption of "no removal' of Historic Fill Materials does not apply. In this case, there is no basis for the 300 ppm "hot spot" Cleanup Goal, especially because the EPA's own risk assessment determined the Arsenic direct-contact Cleanup Goal for commercial/industrial use is 1.6 ppm. The currently utilized New Jersey Arsenic Cleanup Criteria is 20 ppm, which was established in 1992 as a Statewide "background" concentration. However, the proposed Soil Cleanup Standard for Arsenic is 8 ppm, which is also a Statewide "background", but based on a more comprehensive data set than the previous criteria. Unless the basis for designation of on-site materials as Historic Fill Material is clear, there is no justification for use of 300 ppm.

Welsbach/General Gas Mantle (Welsbach) is another Superfund site located in Camden, NJ, where ore was historically processed to remove Thorium used to manufacture gas mantles. Ore tailings and other radiological wastes were disposed in a number of locations within Camden. Information provided by USEPA on July 26, 2005 indicated the Martin Aaron site is located within study area for the Welsbach Site identified as"Area 1General Gas Mantle", and that radioactivity had been identified in an old stream bed at the Martin Aaron site. No acknowledgement of this radioactivity is included in the EPA's handout on the Martin Aaron site: why? Given the preferred remedy leaves the majority of soil contamination is place, identification of any and all on-site radioactivity is essential. I also note that any waste from processing of the Thorium ore is not, by definition, a historic fill. Consequently, the presumption of "no removal" would not apply. This information clearly enforces the need for EPA to define the "historic fill" present at the Site.

In general, in is not clear which Cleanup Goal for Arsenic is being used or what the depth of excavation will be completed. Are the two areas identified as "Arsenic Source Areas" on Figure 2 the only locations for removal based on Arsenic? NOTE: The eastern Arsenic Source Area abuts Sixth Street

Alternative S4 will include institutional controls, and the EPA specifies a review of the site would be required every 5 years. While a 5 year review may be consistent with National Contingency Plan, New Jersey [specifically the Brownfields Act, N.J.S.A. 58:10B-1 et seq., see the Technical Requirements, N.J.A.C. 7:26-6.4 (g)] requires inspection of the site every 2 years with submission of a certification that the engineering controls are being properly maintained and continue to protect public health, safety and the environment. The O&M costs should be reviewed to ascertain the expense of biennial certifications are included.

Alternative S4 is scheduled for 5 months, while Alternative S6 will take 4 years. Consider the following: The contractor mobilizes to the site and removes the 28,000 CY specified under S4 in the allotted time. At that point, it is decided to continue excavation until an additional 36,500 CY are removed. How long will that additional excavation require? Under the EPA's assumed times, the additional CY requires over 3 and a half years! The first 28,000 CY took only 5 months. There is something fundamentally wrong with the time frames presented for these two alternatives. An explanation of the basis of the assumed time frames is required. The evaluation of the alternatives must be re-done using realistic time frames.

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AMENDED MEMO

TO: Bob Spiegel
FROM: R.W. Chapin, P.E.
DATE: Prepared 07/25/05, *with additions 08/31/05*
Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

Soil Remediation: Comparison of Capital Costs of Alternative S4 to Alternative S6:

Alternative S4 specifies partial excavation of contaminated soils in the "source areas of the site" with capping of the remainder that exceed the Cleanup Goals. Alternative S6 specifies removal all soils that exceed the Cleanup Goals. Table 1 summarizes the comparison of the two alternatives.

The comparison is base on total capital costs and the total volume of soil each alternative will remove from the site. Various unit costs were computed. Several unit removal rates were also calculated to gauge estimated efficiency of the alternative. Both alternatives excavate contaminated soils and load that soil into trucks for transport to an off-site disposal site. These alternatives are fundamentally the same, with the volume of soil being the critical variable. The following conclusions are apparent from Table 1

- The average cost of removal (Avg $/CY Removed) is significantly less for Alternative S6.
- Considering remedial excavation projects Alternative S4 has a realistic Removal Rate, or it is reasonable to assume that a competent operator(s) can load 9 tandem trailers in an typical work day.
- Conversely, Alternative S6 has an unrealistically low Removal Rate. There appears to be a fundamental problem with the time used for S6, unless there are special conditions associated with S6 that have not been provide in the EPA Summary. A justification for the time used for S6 is required, as it likely biased the evaluation of the alternatives.
- The average cost per work day (Avg $/Work Day) for alternative S4 is $80,000, an extremely high cost considering the project is only excavation, transport and disposal. (We fully recognize there will be asphalt paving of the site in this alternative, but that would not justify the apparent level of costs.). This extremely high daily cost requires justification.
- Conversely, the Alternative S6 has a realistic average cost per work day.
- This basic assessment of the costs used to evaluate alternatives found questionable numbers. A detailed assessment of the estimated costs for the Martin Aaron site, including the underlying assumptions for each, should undertaken to confirm their accuracy.
- Execution of Alternative S6 addresses an additional 36,500 CY of contaminated soils, but the average costs the additional soil is only $52 per CY, based on the EPA numbers.

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AMENDED MEMO

TO: Bob Spiegel
FROM: R.W. Chapin, P.E.
DATE: Prepared 07/25/05, *with additions 08/31/05*
Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

TABLE 1 COMPARISON OF CAPITAL COSTS ALTERNATIVES S4 and S6 MARTIN AARON SUPERFUND SITE CAMDEN, NJ		
	Alternative S4	**Alternative S6**
Capital Costs, $	6,400,000	8,300,000
Volume Removed, CY	28,000	64,500
Avg $ /CY Removed	229	129
Total Construction Time, months	5	48
"Work Time", weeks	16	188
"Work Time", days	80	940
Removal Rate, CY/day	350	69
Truckloads/day	9	1.7
Avg $ /Work Day	80,000	8830
Margin Analysis		
Add't Volume Removed		36,500
Add't Capital Cost, $		1,900,000
Avg $/ Add't CY		52

Notes: Capital costs & Total Construction times from USEPA.
Avg $/CY Removed = Capital Costs/Volume Removed, CY
Work Time, weeks = [Total Construction Time, months x 4 weeks] – 4 mob/demob, weeks
Mob/demob = 2 week mob + 2 weeks demob, same both alternatives
Work Time, days = Work Time, weeks x 5 work days /week
Removal Rate = Volume Removed/Work Time, days
Truckloads/day = Removal Rate/40 CY per load
Avg $/Work Day = Capital cost/Work Time, days

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AMENDED MEMO

TO: Bob Spiegel
FROM: R.W. Chapin, P.E.
DATE: Prepared 07/25/05, *with additions 08/31/05*
Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

Groundwater Cleanup

The selected alternative for Groundwater cleanup, designated G5, specifies the collection and on-site treatment of groundwater, followed by discharge of the treated groundwater to the Camden County Municipal Utilities Authority (CCMUA) regional wastewater treatment facility. On-site treatment was assumed (for cost estimation purposes) to use air stripping and vapor-phase carbon adsorption to remove volatile organics and chemical precipitation for metals removal. Treatment would achieve the CCMUA pretreatment limits.

The plume of volatile organics in the shallow groundwater (within 20 feet of the ground surface) is estimated to be 1000 feet long and 600 feet wide. Vertically, the plume extends to 60 feet, but is narrower (400 feet wide). The plume contains Arsenic as well as volatile organics. The contamination is moving southeast with the groundwater flow. The groundwater extraction wells will extend to 50 feet below grade and pump at 85 gpm (gallons per minute).

Assuming the source of the contaminants (on-site contaminated soils) is removed, the EPA estimated the groundwater pump and treatment system will require 10 years to restore the groundwater. The Cleanup Goals for groundwater are indicated to be the Drinking Water Standards or the New Jersey Groundwater Quality Standards. However, the proposed remediation is intended to cleanup groundwater "...to the extent practicable..." and there is no statement as to when the system will be turned off. This is common with a traditional "pump and treat" approach to groundwater cleanup.

There is no discussion on any consideration to addressing groundwater contamination using in-situ biological treatment. Data indicates the plume includes chlorinated solvents (Trichloroethylene and Tetrachloroethylene) and chlorinated organics that are created by the biodegradation of those chlorinated solvents (cis-1,2-Dichloroethylene and Vinyl Chloride). In-situ bioremediation of the groundwater plume is presently occurring. And it is occurring where Arsenic, an element that will inhibit biological activity, is present at relative high concentrations. Why wasn't enhancement of the current biodegradation process, using a product such as Hydrogen Release Compound®, considered as a means of addressing the chlorinated solvent? Such products are known to be effective. Was a combination of in-situ for the chlorinated plume (that extends 1000 feet) and a less aggressive pump and treat for the Arsenic in the shallow on-site zone considered? Given Alternative G5 has no definable end point and is the highest cost alternative; other innovative options must be considered.
It appears as though only traditional options were considered.

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TO: Bob Spiegel
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Martin Aaron Superfund Site, Camden, NJ
Initial Review of Proposed Remedial Action, dated July 2005

The solvent plume extends 1000 feet to the southeast and is 600 feet wide in the shallow groundwater zone. Are there residential properties above this plume? Have these homes been evaluated for potential vapor intrusion from this plume? There is no discussion of this issue in the EPA Summary, other than a page 9 reference that this potential exposure pathway exists.

Inspection of the area southeast of the Site on July 26, 2005 found occupied residential housing above the solvent plume. These homes must be evaluated for potential vapor intrusion.

All occupied structures underlying the plume must be evaluated to determine if there is a vapor intrusion problem associated with the Martin Aaron site.

If there has been a vapor intrusion evaluation the results of that work must be included in the EPA Summary, which is the main document by which the public is informed of the site, its problems and the proposed cleanup.

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September 13, 2005

VIA HAND DELIVERY

Mr. Mark Austin
Remedial Project Manager
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: Martin Aaron Superfund Site – Comments to the Proposed Remedial Action Plan

Dear Mr. Austin:

This firm serves as liaison counsel to the Martin Aaron PRP Group ("Group"). The Group consists of approximately 30 PRPs (many of whom have received notice letters from USEPA) who allegedly sent "empty drums" to the Martin Aaron Site for reconditioning. The Group, pursuant to the Public Notice provisions of the Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. §9601 et. seq., is providing USEPA with comments to the Proposed Remedial Action Plan ("PRAP") for the Martin Aaron Superfund Site. Those comments are as set forth herein and in the attached documents/reports.

The Group is providing USEPA with comments without prejudice and without admission of liability, fault or responsibility for the environmental condition of the Martin Aaron Superfund Site or the costs associated with its proposed clean-up. The Group also reserves all defenses that may be available to it with respect to any claim which USEPA may assert against its members with respect to the Site.

500392

By its Proposed Plan, USEPA has identified its preferred remedy for addressing contamination in soil (excavation, treatment and off-site disposal with capping of residual soils) and groundwater (extraction, treatment and discharge to the CCMUA) at the Martin Aaron Superfund Site. As explained in the attached documents/reports, the Group believes there is significant evidence that USEPA has rejected prematurely and without scientific basis other feasible alternatives including several *in situ* remedial approaches that would provide superior treatment and performance at lower cost when compared to USEPA's preferred alternatives. The Group's concerns are compounded by the fact that in the Feasibility Study ("FS") and PRAP, USEPA states that certain Site conditions may prohibit the pump and treat groundwater remedy from achieving remedial action goals for the groundwater zone containing the highest levels of arsenic and VOC contamination (the upper PRM aquifer). In that regard, the Group is concerned that USEPA is seriously underestimating the scope, duration and cost of the pump and treat system, while simultaneously overestimating its effectiveness. For this and the other reasons set forth in the attached documents/reports, the Group requests that USEPA hold in abeyance its selection of a remedy to allow treatability studies to be conducted to evaluate the efficacy of the potential remedial options including the *in situ* methods identified in the PRAP.

The Group respectfully requests that USEPA take the time necessary to fully consider and evaluate the comments and attached reports submitted herewith. The Group has invested considerable time and resources addressing USEPA's PRAP and is concerned that USEPA will not give its comments serious consideration because of its stated goal of issuing the Record of Decision ("ROD") for the Site by September 30, 2005. Adhering to such a self-imposed deadline would not be in the public interest and would be violative of controlling regulations. Specifically, the National Contingency Plan states:

> In the second and final step in the remedy selection process, the lead agency shall reassess its initial determination that the preferred alternative provides the best balance of trade-offs, now factoring in any new information or points of view expressed by the State (or support agency) and the community during the public comment period.
>
> • • • •
>
> These comments may prompt the lead agency to modify aspects of the preferred alternative or decide that another alternative provides a more appropriate balance." 40 C.F.R. §300.430(f)(4)(i).

Given the substantive nature of the comments submitted by the Group (and the likelihood that additional comments will be submitted by other interested members of the public) a meaningful reassessment by USEPA of its proposed remedy cannot reasonably be accomplished within a two week period.

USEPA should take whatever time is necessary, without being constrained by fiscal year-end concerns, to comply with its regulatory mandate to fully and fairly reassess its preferred remedy on the basis of new information and comments provided in the attached documents/reports.

The Martin Aaron PRP Group has worked and will continue to work with USEPA in good faith to attempt to resolve the environmental issues affecting the Martin Aaron Superfund Site.

Please contact me if you have any questions regarding this submission.

Very truly yours,

Louis M. DeStefano
For KLETT ROONEY LIEBER & SCHORLING
A PROFESSIONAL CORPORATION

LMD/mbm
Enclosure

Comments on the USEPA Proposed Plan for the Martin Aaron Superfund Site Camden, New Jersey

Prepared by:

de maximis, inc.
and
Klett Rooney Lieber and Schorling, LLC

With Supporting Reports From:

McLane Environmental, LLC
and
Parsons

Prepared for:

The Martin Aaron PRP Group

Submitted to:

U.S. Environmental Protection Agency
Region II
290 Broadway, 19th Floor
New York, NY

September 13, 2005

Comments on the Proposed Plan for the Martin Aaron Superfund Site Camden, New Jersey

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III. Specific Comments

Exhibits

A. Comments Regarding Site Data and Technical Issues Related to Remedial Investigation, Feasibility Study, and Proposed Remedial Action Plan for Martin Aaron Superfund Site, Camden, New Jersey, September 2005, prepared by McLane Environmental, LLC
B. Discussion of Possible In Situ Remediation technologies for the Arsenic Contaminated Soils and Groundwater at the Martin Aaron Site in Camden, New Jersey, prepared by Parsons.
C. Excerpts from Home Tanning and Leather Making Guide, Albert B. Farnham (circa 1900).
D. Excerpts from Massachusetts Contingency Plan – Background Levels of PAHs and Metals in Soil, May 2002.
E. Comments Regarding USEPA's Evaluation of Alternatives Using the Nine Criteria Required in the National Contingency Plan, Prepared by ***de maximis, inc.***

COMMENTS ON THE PROPOSED PLAN FOR THE MARTIN AARON SUPERFUND SITE CAMDEN, NEW JERSEY

I. INTRODUCTION

The following are comments on USEPA's July 2005 Proposed Remedial Action Plan (PRAP) for the Martin Aaron Superfund Site. ***de maximis, inc.*** and Klett Rooney Lieber and Schorling, LLC, on behalf of the Martin Aaron PRP Group have prepared these comments. Attached to this document are two reports prepared by McLane Environmental, LLC (McLane) and Parsons. These two reports are identified as Exhibits A and B, respectively, and provide information supporting these comments. Other Exhibits referenced in this document are also attached.

The Martin Aaron PRP Group (Group) consists of approximately 30 parties (many of whom have received Notice letters from USEPA) who are alleged to have sent "empty" drums to the Martin Aaron Site for reconditioning. The Group members, without admitting any fact, responsibility, fault, liability or responsibility with respect to the contamination at the Martin Aaron Site and the costs associated with its clean up, have decided to collectively respond to USEPA's PRAP.

This document provides both general comments (G) and specific comments (S). The general comments respond to general concepts and positions contained in USEPA's PRAP, Remedial Investigation (RI) Report or the Feasibility Study (FS). The specific comments respond to statements, tables and/or figures in those same documents.

II. GENERAL COMMENTS

Definition of the Martin Aaron Superfund Site

Comment G-1: The PRAP does not clearly, consistently, or correctly define the limits of the Martin Aaron Superfund Site.

EPA should clarify its definition of the Superfund Site boundary. All of the figures in Section 2 of the FS show the Martin Aaron Superfund Site as being within an approximate rectangular area bounded by Jackson Street, Sixth Street, property north of Everett Street, and the western half of Broadway Street. If EPA defines the Superfund site to include areas that were impacted by the Martin Aaron drum recycling operations, then the limits of the Site should not include the surrounding properties – the scrapyard to the north or the Comarco property, Ponte property and row homes to the south. There is no evidence that Martin Aaron drum recycling operations may have impacted these locations. To the contrary, the historical use and development of the Martin Aaron property and surrounding areas clearly reflects that industries such as tanneries, shoe leather manufacturers, slaughterhouses, white lead works and glass factories likely have impacted soils at those locations. Specifically, the current Comarco property was

occupied by a number of slaughterhouses and meat processing companies (abattoirs), which (like the tannery) would have used arsenic for rodent control. Historical Sanborn maps also show that these companies used coal-fired furnaces and ovens that would have resulted in PAH impacts. The Kimble Glass factory occupied the current scrapyard property to the north of the Martin Aaron property. Arsenic, lead and barium are commonly used in the glass manufacturing process and it is reasonable to conclude (especially given the contaminant distribution patterns) that the glass making process would have impacted this area. Further, scrapyards tend to adversely impact the environment and the agency should consider that possibility in its definition of the Site.

The PRAP interchangeably uses the expressions "Martin Aaron Superfund Site", "Martin Aaron site", "Martin Aaron property", and "Martin Aaron parcel". The lack of a consistent definition is confusing to the reader and leads to an incorrect impression of the extent of the Superfund Site and potential sources of contamination relating thereto.

USEPA should rewrite the PRAP to use a single and correct term when referring to the Site so that the public can have a clear understanding of the extent of contamination and scope of the Superfund remedy. USEPA should then extend the public comment period to allow the public ample time to review the corrected PRAP.

Evaluation of Alternative Technologies for Soil

Comment G-2: USEPA has not properly evaluated all of the reasonable combinations of soil and groundwater technologies and therefore the development and evaluation of alternatives for the Site is incomplete and incorrect.

For example, only Alternative S-3 evaluates in-situ technologies and does so jointly for arsenic and VOC remediation of soil (solidification and SVE, respectively). In evaluating Alternative S-3, USEPA concludes that there is a relatively high degree of technical uncertainty; it fails, however, to clarify that this uncertainty is predominantly associated with the SVE technology and not with the soil solidification component of the alternative. As a result, the in-situ technology for arsenic in soil was inappropriately eliminated.

Soil stabilization to remediate metals contamination is a proven technology that has been selected by EPA at other Superfund sites. Exhibit B, prepared by Parsons, discusses in-situ soil options that have been applied successfully at other sites and should be further evaluated for this Site.

USEPA should evaluate a treatment train that combines solidification/stabilization for arsenic source area soils with excavation or other options for VOC source areas before selecting a remedy for the Site. Such a combination of alternatives is feasible and appropriate and should be considered, since the arsenic and VOC source areas do not overlap significantly.

Elimination of Remedial Alternatives Based on Technical Uncertainty

Comment G-3: USEPA has selected soil Alternative S4 (Excavation, Treatment and Off-site Disposal), in large part, on the *assumption* that this alternative has relatively less uncertainty than the other alternatives considered by USEPA. As required by relevant regulation and guidance, USEPA should substantiate and quantify the uncertainty it alleges to be associated with those other alternatives before selecting a remedy for the Site.

The *National Contingency Plan* ("NCP") states:

> *"bench or pilot-scale treatment studies shall be conducted when appropriate and practical to provide additional data for the detailed analysis and to support engineering design of remedial alternatives". (40 CFR §300.430(d)(1))*

A Guide to Preparing Superfund Proposed Plans, Records of Decision and Other Remedy Selection Decision Documents (OSWER 9200.1-23; EPA 540-R-98-031; PB98-963241, pp.1-5), provides the same directive:

> *"the RI generally includes conducting treatability tests to evaluate the potential performance and cost of the treatment technologies being considered for addressing these risks".*

Similarly, EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (October 1988) states that:

> *"if remedial actions involving treatment has been identified for a site, then the need for treatability studies should be evaluated as early as possible in the RI/FS process to avoid delaying the issuance of the FS."*

These documents confirm the agency's own expectation that treatability studies are to be an integral part of the remedy selection process.

Here, without explanation, EPA rejects certain otherwise viable alternatives on the unsupported and generalized claim that they present more uncertainty than the selected alternatives. Specifically, with respect to stabilization of arsenic in soil, the PRAP states:

> *"Even after treatability studies to determine the appropriate injection points, solidification agents, dosage rates and other performance parameters, the uncertainties regarding the implementability would still be high, especially given the heterogeneous nature of the fill material at the site."* (PRAP page 18.)

Neither the PRAP nor the FS provide any support for this statement. No data or other information is provided by the agency to demonstrate that the heterogeneous nature of the fill or other site factors would prevent the successful implementation of a stabilization remedy. In the absence of any treatability studies, EPA has no basis to quantify the degree of uncertainty, if any, associated with the implementation of a stabilization remedy. USEPA's rejection of solidification as a viable alternative is arbitrary and without proper scientific basis (see Parsons Report, Exhibit B).

In addition, the uncertainties noted in the above quotation from the PRAP are overstated and inconsistent with the FS. The FS specifically states that:

> *"[a]ll alternatives can be implemented at the site, and no technical or administrative implementability problems are expected for any of the alternatives"* (FS p.5-11).

USEPA should amend the PRAP to accurately reflect the conclusion in the FS that there are no technical or administrative implementability problems expected for any of the alternatives.

USEPA's rejection of Alternative G-4 (Fixation of Arsenic in Groundwater) in the FS is likewise unsupported. The acknowledgement in the FS that all alternatives can be implemented without technical or administrative implementability problems also indicates that the PRAP is incorrect with respect to Alternative G-4.

Even in the absence of this conflict, the PRAP states:

> *"Alternative G-4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G-4, relative to all other groundwater alternatives."* (PRAP p.18).

The establishment of a proper chemical dosage and mix for chemical fixation is not the type of uncertainty, in and of itself, that would justify elimination of this option (see Parsons Report, Exhibit B). The word "uncertainties" as applied by USEPA to G-4 is a misnomer since such studies establish performance or design parameters more so than determine whether fixation will work at all. The purported uncertainty should not have caused USEPA to reject fixation (especially where this alternative is considerably less expensive than the proposed remedy) without conducting the appropriate treatability studies. Moreover, EPA' s failure to conduct treatability studies runs counter to EPA's stated policy to encourage the use of innovative technologies where, as here, such technology offers the potential for comparable or superior treatment and performance at lower cost compared to other technologies. Both the stabilization of arsenic in soil and fixation of arsenic in groundwater have the potential to provide comparable, if not superior, treatment performance at significantly lower costs compared to USEPA's Preferred Alternative. Both technologies have been successfully implemented at other sites (see Parsons Report, Exhibit B).

Moreover, where, as here, EPA has selected a source control alternative for soil involving off-site treatment, after removal, Section 300.70 (C) of the NCP requires that USEPA determine that this alternative is either 1) more cost effective than other remedial alternatives; 2) will create new waste management capacity; or 3) is necessary to protect human health and the environment. Neither the PRAP nor its supporting documents provide evidence that off-site treatment of the soil meets any of these criteria.

In addition, USEPA acknowledges that its Preferred Alternative for groundwater may have technical difficulties meeting the remedial objectives. Specifically, EPA identifies

in the PRAP certain site factors that may limit the effectiveness of the Preferred Alternatives, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination. Thus, EPA itself has identified what may well *be greater uncertainties associated with a pump and treat remedy* than those uncertainties purported to be associated with in-situ chemical fixation. The potential that the remedial effectiveness of the pump and treat alternative may be greatly limited is especially critical here where the most significant expenditures are "up front" in constructing the extraction and treatment system.

For all of these reasons, USEPA has arbitrarily eliminated remedial alternatives for soil and groundwater based on the erroneous assumption that the selected remedy has a lower degree of uncertainty associated with its technical implementability. Accordingly, and as stated in the FS, pilot/treatability testing should be conducted to more appropriately assess other technologies prior to selecting a remedy for the Site.

Preferred Groundwater Remedial Alternative G5

Comment G-4: USEPA's Preferred Alternative for groundwater (G5 – Groundwater Collection and Treatment):

A. Is not appropriate or necessary to remediate VOCs in groundwater in a reasonable time frame once the VOCs in soil are addressed (as acknowledged by USEPA).
B. Has not been demonstrated to more effectively remediate arsenic in groundwater, compared to other alternatives.
C. Has significant uncertainty (as acknowledged by USEPA) relative to effectiveness and achieving the RAOs.
D. Is not based on a complete or accurate conceptual site model for the groundwater and geochemistry at the Site.
E. May exacerbate the extent of arsenic and other contaminants in groundwater.
F. Is not necessary given the current use and expected future use of groundwater in the area.
G. Has been estimated by USEPA to cost, at a minimum, $5 million dollars more than a potentially effective in-situ alternative.
H. Has not been agreed to by the CCMUA and may not meet CCMUA discharge limits as currently proposed by USEPA.
I. Has significant construction, operational and maintenance complexities that have not been fully or adequately addressed by USEPA.
J. May be inconsistent with permitting and other limitations that may be imposed by the Delaware River Basin Commission (DRBC).
K. Is inconsistent with the State of New Jersey Water Supply Administration's concerns for this area.
L. Is not considered to be in the best interest of the community and the potential for site redevelopment.

Supporting Information for Comment G-4

A. Alternative G5 is not appropriate or necessary to remediate VOCs in groundwater in a reasonable time frame once the VOCs in soil are addressed (as acknowledged by USEPA).

With regard to the VOC contamination in groundwater, USEPA's RI Report, FS Report and PRAP all conclude that natural attenuation of VOCs is ongoing. The FS and the PRAP also acknowledge that treating or removing the VOC source areas would substantially reduce the time needed for natural attenuation to achieve the remedial action goals. Specifically, on page 19 of the PRAP, USEPA states:

> *"With the removal of VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable timeframe."*

USEPA, however, inappropriately eliminates Monitored Natural Attenuation ("MNA") for VOCs in groundwater because it assumes in the PRAP that arsenic will not naturally attenuate. That conclusion ignores the fact that VOCs and arsenic in groundwater are generally not co-located, and can be treated separately in a more efficient and cost effective manner than presently proposed.

As explained in Exhibit A by McLane Environmental, natural attenuation of the VOCs in groundwater is estimated to take approximately 20 years, not the 40-50 years USEPA indicates in the PRAP. A 20-year MNA time frame has been determined by USEPA at other sites to be reasonable, especially, as here, where the groundwater is not expected to be a drinking water source.

B. USEPA has not adequately demonstrated that Preferred Alternative G5 will more effectively remediate arsenic contamination in groundwater compared to other alternatives.

USEPA has not demonstrated through pilot or bench scale testing its Preferred Alternative (extraction and treatment) will be the most effective remedy for arsenic. To the contrary, the FS identifies other technologies as feasible, implementable and without technical limitation. As discussed by Parsons in Exhibit B, in-situ chemical fixation of arsenic in groundwater (Alternative G4) is a remedy that has been proven to be effective at other sites and accepted by USEPA. As mentioned above, USEPA dismisses this remedial technology because it believes there is a higher degree of uncertainty compared to pump and treat. Until treatability studies have been conducted to evaluate in-situ remedies such as chemical fixation, it is inappropriate and unreasonable for EPA to select any alternative to address arsenic in groundwater. This is especially so, since USEPA concedes that its Preferred Alternative for arsenic in groundwater may not achieve the RAOs (see below).

C. USEPA has acknowledged that there is significant uncertainty relative to effectiveness of Preferred Alternative G5 at achieving the Remedial Action Objectives for groundwater.

USEPA cautions in the PRAP on page 19 that:

> *"...certain site factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination, may limit*

the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame."

This type of uncertainty with groundwater extraction underscores the need to fully evaluate other alternatives, such as in-situ chemical fixation, which would not require groundwater pumping and not pose the potential to dewatering the water-bearing zone.

Further, relative to the groundwater extraction and treatment system, USEPA concludes on page 4-10 of the FS that:

> *"It has been assumed that the system would be operated for 10 years to remove the majority of the contaminant mass (assumed to be seven and one-half pore volumes) and that MCLs in groundwater (with the exception of the shallow Upper PRM groundwater) will be met within the 10-year timeframe."* (emphasis added).

This statement reflects that the short and long-term effectiveness of the pump and treat remedy, and the estimate of costs associated therewith, is not based on scientific calculations but rather on nothing more than a series of untested assumptions. Worse yet, the assumption that MCLs will be met in 10 years has one notable exception -- the shallow upper PRM aquifer. That water-bearing zone contains the highest level of arsenic in groundwater. EPA makes no effort to quantify how long it will take to remediate the upper PRM Aquifer. As such, the time needed to operate the pump and treat system to achieve MCLs is unknown and EPA cannot estimate the costs associated with that remedy with an accurate basis.

More importantly, USEPA's admission in the FS that a pump and treat remedy will not achieve MCLs in ten years with respect to arsenic contamination in the Upper PRM groundwater, undermines the very reason EPA selected pump and treat as the preferred remedy in the PRAP -- *"its ability to aggressively reduce arsenic contamination in a relatively short time frame (estimated at 10 years)."* (See PRAP p.19). By its own admission, USEPA has concluded that a pump and treat remedy likely will not achieve that goal. In fact, a scientifically valid examination of the issue reveals that it will take hundreds of years (not 10 as USEPA assumes) to remediate arsenic in groundwater through a pump and treat approach (see McLane Environmental Report, Exhibit A.)

USEPA is well aware of the poor performance of groundwater extraction remedies to treat contaminants at other sites. On page 15 of *Pump and Treat Ground-Water Remediation, A Guide for Decision Makers and Practitioners* (EPA/625/R-95/005, July 1996) USEPA identifies "heterogeneous, multiple layer sites" as ones where the technical feasibility of complete cleanup of mobile, dissolved phase contaminants is "likely to be uncertain". At many sites with contaminants similar to those found at this Site, USEPA has abandoned the pump and treat systems in favor of other alternatives. Unfortunately at these sites, considerable costs were incurred to design, install and operate the pump and treatment systems before USEPA realized the approach would not work. This might have been avoided if other alternatives were more fully evaluated prior to the selection and implementation of a pump and treat remedy. The uncertainty USEPA assigns to the

implementation of a pump and treat remedy at this Site raises serious concerns that a similar path will be followed here.

D. Alternative G5 is not based on a complete or accurate conceptual site model for the groundwater and geochemistry at the Site.

As detailed below in Comment G-6 and in Exhibit A, USEPA's conceptual site model (CSM) for the groundwater and geochemistry is not complete or accurate. For example, by combining wells from different strata and seemingly ignoring published characterization data for the PRM aquifer, USEPA has significantly underestimated the hydraulic conductivity of the PRM. As a result, USEPA has underestimated the number of wells and volume of water that will needed to establish a zone of capture that encompasses the arsenic and VOC plumes. This will have a considerable impact on the size and cost of the extraction system and increase the probability that the extraction system will not achieve the RAOs.

USEPA's incomplete CSM also has resulted in a significant underestimation of the time that will be required to achieve the RAOs for groundwater. USEPA has incorrectly estimated the number of years to potentially flush the arsenic from the groundwater. As presented in Exhibit A, McLane Environmental, using USEPA's own equations and assumptions, has estimated that it will take over 100 years (not 10 years as assumed by USEPA) to flush arsenic contamination from the aquifer.

E. Alternative G5 may exacerbate the extent of arsenic and other contaminants in groundwater.

USEPA acknowledges in the RI and PRAP that the highest concentrations of contaminants exist in the silty soils in the upper 10-20 feet of the subsurface. McLane Environmental has observed that the concentrations of contaminants below this clay are at least an order of magnitude lower than above (or in) the clay layer (see Exhibit A). While recognizing that the pump and treat remedy will likely dewater the uppermost groundwater, USEPA fails to recognize that this also may induce the flow of contamination downward, thereby increasing the level of contamination at depth.

Although USEPA acknowledges that there is contaminated groundwater migrating onto the Martin Aaron Site, it does not, however, also consider the potential that its pump and treat remedy may enhance the migration of these constituents onto the Site.

USEPA should respond to these concerns that the pump and treat remedy may exacerbate the vertical and lateral extent of contamination in the groundwater.

F. Alternative G5 is not necessary given the current use and expected future use of groundwater in the area.

On page 19 of the PRAP, USEPA states:

> *"While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations in a relatively short time frame."*

USEPA has failed to demonstrate the need to *"speed that process"* since the RI and FS recognize that there is no current complete exposure pathway.

USEPA should recognize in its evaluation of remedial alternatives that the groundwater in this area contains naturally occurring metals that often require treatment before the water can be used as a drinking source. In addition, the area has a long history of widespread industrial activity not associated with the Martin Aaron drum recycling operations that has also impacted groundwater quality. Even after VOCs naturally attenuate and remediation of arsenic takes place, the groundwater is not likely to be suitable for drinking water due to these naturally occurring metals. Therefore, USEPA's rationale for selecting pump and treat because of a need to *speed up* the remedial process is unfounded.

G. USEPA has estimated that Alternative G5 will cost, at a minimum, $5 million dollars more than a potentially effective in-situ alternative for arsenic in groundwater.

Alternative G5 (Extraction, Pretreatment and CCMUA Discharge) is estimated by USEPA to cost $6,600,000, assuming that the RAOs are met in 10 years. USEPA estimates that each year beyond that 10-year assumption will cost a minimum of approximately $700,000. As noted above, USEPA recognizes that there is significant uncertainty that a groundwater extraction remedy will achieve the RAOs in 10 years. Comparatively, Alternative G-4 (Chemical Fixation and MNA) is estimated by USEPA to cost $1,700,000, with an estimated annual O&M of $26,000. USEPA has estimated it will take 40 years to completely remediate the area of impact in this water-bearing zone using Alternative G-4. This 40-year estimate is driven more by the arsenic presence than by the VOC presence. This estimate is misleading, since by its own admission on page 14 of the PRAP, USEPA states:

> *"A pilot study to evaluate methods of distributing chemicals and the resulting effectiveness would be required prior to full scale injection."*

Without this type of study, USEPA cannot, with reasonable accuracy, estimate time frames for remediation, or the type of in-situ remedy that could be implemented.

As discussed by Parsons in Exhibit B, USEPA appears to have considered only the use of a polymer-based injection, despite the fact that there are other sites being successfully treated for arsenic contamination using other chemicals. We suggest USEPA consider these other in situ chemicals in its alternative evaluation before selecting a remedy.

H. Alternative G5 has not been agreed to by the CCMUA and may not meet the discharge limits.

USEPA has assumed that the CCMUA is willing to accept the treated water from the groundwater treatment system. Furthermore, USEPA has assumed in its cost estimating and conceptual design that the groundwater will only need to be treated for arsenic prior to discharge to the CCMUA. In the FS, USEPA concludes that the levels of VOCs in the groundwater will not require pretreatment prior to discharge, however on Table 4-3 of the FS, no VOC discharge limits for the CCMUA are provided.

Further discussions with the CCMUA, along with appropriate groundwater treatability testing, are warranted before Alternative G5 is selected.

I. USEPA has not fully evaluated the construction, operational and maintenance complexities of the groundwater extraction and treatment system associated with Alternative G5.

USEPA has underestimated the size, operation and maintenance requirements for a groundwater treatment system capable of handling up to 100 gpm or more. The tables in the appendices to the FS note that the treatment building will likely contain a gravity settling system, sand filter, filter press, at least 4 process and storage tanks, several chemical storage tanks, equalization tanks, transfer pumps, mixing pumps and controls. There will also need to be storage space for chemicals such as hydrogen peroxide. Figure 4-10 of the FS illustrates the Groundwater Treatment Facility to be approximately 30 feet by 50 feet (1500 square feet). Existing treatment buildings for similar applications tend to be 3000 to 5000 square feet in size.

The location of the treatment building is conceptualized by USEPA to be on the Ponte Equities property (see FS Figure 4-10). There is no information that indicates this location will be acceptable to the owners of that property or that this location is suitable.

In addition to the treatment building, approximately ¼ to ¾ acres will be needed for parking, outside material storage, equipment storage, deliveries of consumable materials, pick up of potentially hazardous waste sludge from the chemical precipitation and treatment process, set-back requirements and security fencing.

The treatment building should be placed within a security fence not only for equipment protection, but to protect the community from the operating equipment, chemicals and waste sludge from the treatment process.

These factors have not been given adequate consideration during the alternatives evaluation and comparison process. Combined with technical limitations and impediments, they raise serious questions about the feasibility and cost of the selected pump and treat remedy.

J. USEPA has not included potential permitting and other limitations that might be imposed by the Delaware River Basin Commission (DRBC).

USEPA should clarify and discuss (if applicable) whether the DRBC may have jurisdiction over the extraction of groundwater in this area. If such jurisdiction exists, then USEPA should consult with the DRBC and re-evaluate the effects of this jurisdiction on the groundwater remedy. The DRBC Water Code and Comprehensive Plan to Establish Water Usage Reporting Requirements (Final Rule) sets forth permitting, reporting and operational requirements for wells or systems that exceeds 100,000 gallons per day during any 30-day period. The groundwater extraction system proposed by USEPA will withdraw, at a minimum, 122,400 gallons per day (at USEPA's assumed extraction rate of 85 gpm). This suggests that DRBC permitting requirements may be

applicable and should be addressed before a pump and treat remedy is selected by USEPA.

K. The use of a groundwater extraction remedy is inconsistent with the State of New Jersey Water Supply Administration's concerns for this area.

The State of New Jersey has designated two areas of water supply concern. These are areas where the State believes excessive water usage poses significant threat to the long-term integrity of a water supply source. Critical Area No. 2 was declared in 1994 and includes Camden County. Water allocations from the Potomac-Raritan-Magothy aquifer system were reduced an average of 22 percent within this region by the NJDEP Water Supply Administration. The selection of a groundwater remedial alternative which is depletive, when other alternatives may be equally (or more) effective is not consistent with the State's objective of preserving the water supply source in this area.

L. Alternative G5 is not in the best interest of the community and the potential for site redevelopment.

When compared to the potential application of an in-situ groundwater remedy for arsenic (coupled with MNA for VOCs), Alternative G5 is not in the best interest of the community and will significantly restrict the site from redevelopment for the following reasons:

- The treatment building will require a security fence, security alarms, and lighting. This will be an on-going facility for at least 10 years.
- The treatment building will require alarms which could sound at any time of the day or night, assuming the plant runs 24 hours per day, 7 days per week.
- The treatment process will generate noise, even if the building is constructed to minimize the noise.
- There will be deliveries of materials and equipment, as well as trucks to remove the waste sludge from the site.
- The pipelines connecting the wells to the treatment building will be placed in trenches. As shown in the FS these pipelines will go directly from the well(s) to the building. The FS does not account for future construction of any buildings that require foundations or underground utilities (such as water and sewer) which will be constrained by the presence of these pipelines.
- The pipelines to wells will require the excavation of many streets and sidewalks in the area. These pipelines must remain accessible for maintenance. In addition, the installation of these pipelines will need to incorporate the existing public utilities (water, sewer, electric) and may require that these services be temporarily disconnected.
- Extraction wells and pipelines will need to remain accessible for maintenance and/or replacement, thereby precluding development in these areas. Recovery wells within the streets and sidewalks poses additional health and safety concern for traffic and pedestrians, and individuals working in this area.

Accordingly, USEPA should re-evaluate its selected remedy and give full consideration to the serious short and long-term impacts to the community.

Conceptual Site Model

Comment G-5: As illustrated by the comments herein and in Exhibit A from McLane Environmental, USEPA has failed to develop a Conceptual Site Model (CSM) for this Site that meets any of the fundamental objectives outlined in its own guidance documents. As a result, the identification of appropriate remedial technologies is incomplete and scientifically unfounded and USEPA has prematurely and arbitrarily selected a remedy that is not scientifically supported by an accurate understanding of the Site.

According to USEPA guidance, the CSM is used to identify and develop remedial action objectives (RAOs) for the site (OSWER Directive 9355.3-11). The RAOs generally describe what the remedial action is expected to accomplish. The Feasibility Study (FS) relies on the RAOs (which are based on the CSM) to identify and screen various remedial technologies for soil and groundwater. Therefore, the CSM is the cornerstone of the remedy evaluation and selection process.

According to USEPA's own guidance (OSWER Directive 9355.3-11, page 2-15), a primary objective of a Remedial Investigation (RI) is to:

> *"Develop a Conceptual Site Model (CSM) that presents hypotheses regarding the suspected sources and types of contaminants present, contaminant release and transport mechanisms, rate of contaminant release and transport, affected media, known and potential routes of migration, and known and potential human and environmental receptors. Hypotheses presented in the model are tested, refined and modified throughout the RI."*

The following provides examples of how USEPA's CSM for this Site is flawed and fails to achieve the required objective cited above.

EPA's CSM Fails to Adequately Evaluate and Explain Suspected Sources and Types of Contamination

There is extensive historical information that documents nearly 40 years of tannery operations at this Site – an industry that is well known for its use of arsenic. This information is detailed in the report *Summary of Historical Ownership and Uses of the Martin Aaron Superfund Site and Select Nearby Properties*, July 2005, which is in the Administrative Record. In addition, USEPA and other regulatory agencies have documented the use and presence in the environment of arsenic at many other former tannery sites.

USEPA's CSM does not provide a complete hypothesis that explains the source(s) of contaminants at the Site because it fails to adequately consider the environmental impacts from the historical operations at the Site. For example, the areas of higher concentration of arsenic in soil at this Site are coincident with the location of historic tannery operations

– specifically, the beam houses where most of the tannery operations were conducted. This explains the source and distribution of arsenic in soil and groundwater at this Site, but is not discussed by USEPA. Accordingly, USEPA's CSM does not provide an accurate hypothesis regarding suspected sources of contamination at the Site.

Furthermore, USEPA fails to adequately consider the other historical sources of contamination in the area (that are unrelated to the Martin Aaron drum recycling operations) in its CSM. For example, the former Kimble Glass factory to the north and the former Camden White Lead Works to the east are likely sources for the barium, lead, arsenic and other contaminants detected in the soil and groundwater in the area. Yet these industries and their potential as sources of contaminants are barely discussed (if at all) by USEPA in the RI, FS or PRAP.

USEPA's CSM also fails to adequately address and incorporate background soil and/or groundwater quality in its explanation of the source(s) of contamination at the Site. EPA's CSM does not consider upgradient sources that are contributing to the groundwater contamination at the Site, as evidenced by the presence of significant levels of contaminants (such as arsenic) in monitoring wells located upgradient of the Martin Aaron property.

USEPA's CSM also does not adequately explain the nature (type) of contaminants present in the soil or groundwater. For example, and as described in Exhibit A, USEPA did not conduct any tests to determine the species of arsenic in the soil or groundwater at the Site (i.e. arsenite or arsenate). As a result, USEPA's CSM is unable to adequately explain how arsenic may have migrated in the soil and/or groundwater.

USEPA's CSM fails to explain contaminant release and transport mechanisms, rate of contaminant release and transport, affected media or known and potential routes of migration.

USEPA's CSM fails to put forth any reasonable explanations for the migration of contaminants in the area of the Site. For example USEPA's CSM (as described in the RI/FS and PRAP) states that contaminants such as arsenic and PAHs migrated through the unsaturated soil from the Martin Aaron property to the Comarco property and the row homes to the south. This is contrary to USEPA's RI which states relative to the migration potential of contaminants in the vadose zone (unsaturated soil):

> *"...the transport of contaminants in the vadose zone is primarily downward, directly to the water table, with little to no lateral migration from the source areas."* (Section 6.1.1)

USEPA's CSM fails to accurately explain the extent of affected media because its interpretation of the distribution of contaminants fails to include critical data. For example, USEPA has incorrectly mapped the arsenic concentrations present in groundwater (see Exhibit A). The extent of arsenic in groundwater, as shown in RI Figure 5-47, FS Figure 2-11, and PRAP Figure 3, among others, show the arsenic plume to be centered around wells MW-1S and MW-16S. Yet RI Table 5-11, FS Table 4-3, and

other tables show the arsenic in well MW-13S to be several parts per million. Therefore, USEPA has incorrectly interpreted the extent of the impact to groundwater.

As explained in more detail in Exhibit A, USEPA's CSM does not adequately or accurately explain transport mechanisms or known and potential routes of contaminant migration in groundwater. USEPA has developed and relied on a conceptual groundwater flow model that inappropriately combines information from wells that are installed in two different water bearing zones. One set of wells is installed in a perched zone that exists on top of (or in) silty/clay materials. The other shallow wells are installed in the Shallow Upper PRM aquifer at this Site. The water levels in the perched zone wells are not representative of the PRM aquifer water levels. As a result, USEPA has determined horizontal and vertical gradients from these wells that are not representative of PRM hydraulic conditions (see Exhibit A). USEPA's CSM incorrectly assumes that there is a continuous, saturated zone through which the contaminants in groundwater migrate. It is more likely, as explained in Exhibit A, that several of the contaminated wells reflect pockets of perched water that may not be hydraulically connected to the PRM. Similarly, the average hydraulic conductivity value of less than 1 foot per day (as estimated by USEPA in the RI, page 4-7) is not representative of the hydraulic conductivity of the PRM aquifer, but rather the perched water zone. Furthermore, hydraulic conductivity estimates of 4 to 6 ft/day for other portions of the PRM aquifer beneath the Site are at least a factor of 10 lower than values reported by other well-known studies of the PRM. This inconsistency with published values may also reflect improper well installation and development, or problems with the analysis of the slug test data. Without accurate and consistent hydraulic data, USEPA's CSM cannot fulfill its intended purpose – to explain the transport and migration of contaminants in groundwater.

As discussed in Exhibit A, the geochemical CMS is also flawed and incomplete. For example, McLane Environmental explains that sufficient data have not been collected to reliably determine the aquifer redox conditions, or to determine the form of dissolved arsenic (arsenate or arsenite) in ground water beneath the site. There also appear to McLane Environmental to be problematic trends and associations in the geochemical data that may indicate errors in sampling. The uncertainty in the geochemistry CSM has significant implications in explaining the fate and transport of both arsenic and VOCs.

As detailed in the other comments herein and in the attached reports, the implications of USEPA's flawed CSM for this Site are far-reaching and have seriously compromised the remedy selection process. As a result, USEPA should not select a remedy at this time, but should:

- Revise the RI and CSM to appropriately consider historic and off-site sources of contamination;
- Conduct a thorough review of the existing data and its correct application and interpretation;
- Conduct the additional testing needed to address fundamental data gaps in the RI/CSM; and,
- Revise the RI and CSM to accurately reflect historic and current site conditions.

Only after this work is completed will USEPA have a CSM that accurately explains all relevant data and serves as a sound basis for evaluating remedial alternatives.

Need for Separate Operable Units

Comment G-6: USEPA should bifurcate the remedy for the Site into separate Operable Units.

USEPA has identified certain areas where VOCs and arsenic in soil are assumed to be ongoing sources of contamination to the groundwater. On this assumption, USEPA has concluded that these soil areas must be actively remediated.

USEPA makes the following statements in its documents:

> *"These natural degradation processes may decrease VOC contaminant concentrations over time, especially if an active soil remedy is undertaken to address VOC source areas."* (PRAP, pg. 13)
>
> *"Studies performed during the RI indicate that natural attenuation of VOCs is probably underway."* (PRAP, pg. 13)
>
> *"Environmental monitoring will be used to assess the degree of natural attenuation and allow estimates of time necessary to reach remedial goals".* (FS, pg. 4-10)
>
> *"The arsenic would be expected to precipitate onto the aquifer matrix over time as the shallow upper RPM (sic) aquifer slowly returns to aerobic oxidizing conditions. The time for this to occur is dependent on the rate of oxygen and the transfer to the shallow aquifer and the degree to which the oxygen will be utilized by microorganism present in the aquifer to degrade organic substrates. The time needed for this to occur can be estimated based on natural attenuation data collected as part of this alternative."* (FS, pg. 4-10)

Therefore, in its own documents, USEPA clearly puts forth an expectation that groundwater conditions will improve following soil source remediation, and that the timeframe for natural attenuation <u>*can only*</u> be determined by subsequent monitoring.

Accordingly, there is adequate information and technical justification for USEPA to stage the remediation by first addressing contaminant source areas in soil and then monitoring the effects of that remedial action on the groundwater quality. Only until those effects have been quantified and evaluation can USEPA make an informed decision regarding the need for active groundwater remediation. USEPA should separate the soil and groundwater into two Operable Units for the purpose of remedy selection.

Remedial Investigation (RI) Report

Comment G-7: The Remedial Investigation (RI) Report is characterized by missing and incorrect data and information, incorrect data interpretation, unsupported assumptions, unexplained anomalies and inconsistent statements. In its current form, it should not be used as a basis for alternative evaluation and should be corrected and revised before USEPA makes a determination of an appropriate soil or groundwater remedy for this Site.

- An example of missing data and information is found in the Summary of Remedial Activities section of the RI Report. This section refers to NJDEP and USEPA remedial actions, yet no details are provided explaining the remedial actions performed. Specifically, USEPA does not discuss what remedial work was conducted, where the work was conducted, and where soil either was either moved or removed. This information is essential in accurately characterizing the Site.

- An example of the incorrect data contained in the RI is found in Table 5-11 (page 6 and 7 of 29), which lists arsenic concentrations found at MW-13S, a critical well location. The June 2002 results for total arsenic was 6400 ug/L. The September 2002 results for total arsenic is shown as blank, indicating that the result is below detection criteria. However, this is incorrect. The total arsenic result reported for September in Table G.11 of the RI Report (Page 7 of 31 of the Appendix) was 5890 ug/L. However, this result was rejected for unexplained reasons. Furthermore, each figure used by USEPA in the RI and FS to illustrate the extent of arsenic in groundwater uses the September 2002 results and therefore carries forward this erroneous interpretation of groundwater contamination. As a result, USEPA repeatedly and incorrectly indicates that arsenic in groundwater is below criteria at location MW-13S. This has a significant and compounding impact on the evaluation of alternatives in the FS.

- An example of the unsupported assumptions contained in the RI can be found in Chapter 9, where there are several references to sources of contaminants at the Martin Aaron property including"*...buried drums of hazardous waste (excavated from depths below the groundwater table)...*". However, there is no supporting information showing that drums containing hazardous wastes were ever excavated from below the water table. In fact, Section 2.4.2.5 of the RI indicates that despite extensive investigation, only several drums were found at the Site. No information is provided regarding the location or depths of the drums, nor what they contained. Yet USEPA relies upon this assumption in an attempt to explain the presence and distribution of contaminants at the Site.

- An example of the unexplained anomalies and inconsistencies contained in the RI can be found in the USEPA's failure to explain the hydrogeologic conditions observed at well MW-13S. The location of this well is important in the interpretation of site conditions because it is at the downgradient edge of the Martin Aaron property,

adjacent to a former tannery beam house and the Rhodes building. Table 4-1 and Figure 4-7 shows a water level of –0.45 feet at MW-13S. This water level is approximately 6 feet higher than expected given the potentiometric surface map. The RI Report provides no discussion or explanation for this water level or its implications. McLane Environmental discusses this point in detail in Exhibit A and concludes that this well is likely installed in a perched water zone.

These examples call into question the accuracy, completeness and validity of the data presented in the RI, and all subsequent evaluations, conclusions and recommendations derived from the RI, as presented in the RA, FS and PRAP. No decisions regarding remediation at the Site should be made unless and until the RI undergoes a thorough and comprehensive review including:

- A thorough QA/QC review;
- A crosscheck of all data points, figures and tables;
- A thorough examination of the validity of all assumptions and statements of facts; and,
- The identification and closure of important data gaps.

USEPA's Evaluation of Alternatives Using the Nine Criteria Required in the National Contingency Plan

Comment G-8: USEPA's conclusion in the PRAP that its Preferred Alternative for the Site "*provides the best balance of tradeoffs among the alternatives*" is inconsistent with USEPA's underlying evaluation of the NCP criteria. USEPA's Preferred Alternative should be ranked *lower* than some of the other remedial alternatives rejected by USEPA, especially since USEPA concede that there is significant uncertainty that the pump and treat remedy will be effective, *if it works at all*.

The National Contingency Plan (NCP) requires that USEPA select a remedy that is cost-effective, permanent and provides the best balances of the following nine criteria:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume
5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

Criteria 1 and 2 are considered by USEPA to be "Threshold Criteria" and statutorily must be satisfied in order for an alternative to be eligible for selection. If an alternative does not meet these alternatives, it cannot be carried forward in the evaluation process. As detailed in Exhibit E, USEPA concludes, with the exception of the No Action alternative, that *all* alternatives for soil and groundwater meet these two Threshold Criteria. With the

exception of the "No Action" alternatives for soil and groundwater, all other alternatives are carried forward.

Criteria 3 through 7 are considered "Balancing Criteria". USEPA must identify which of these criteria vary significantly and focus its evaluation on these factors. As detailed in Exhibit E, USEPA does not demonstrate that its Preferred Alternative provides the best balance of these criteria. In fact, USEPA concludes that some of the other alternatives provide a greater degree of short and long-term permanence and effectiveness. Moreover, USEPA concedes that its Preferred Alternative for groundwater may not work at all due to concerns regarding dewatering and subsurface soil conditions. USEPA concludes that other alternatives have the potential for a greater reduction in the toxicity, mobility or volume of contaminants. For example, USEPA concludes that Alternative G4 (Geochemical Fixation for arsenic in groundwater) will have greater short-term effectiveness than its Preferred Alternative G5 (pump and treat). USEPA also concludes that none of the alternatives have technical or administrative implementability problems. Therefore the implementability criteria cannot be used to eliminate the alternatives.

Criteria 8 and 9 are considered "Modifying Criteria" and are to be formally assessed by USEPA after the public comment period. The State has not formally commented and the public comment period has not ended.

As explained in Exhibit E, USEPA has relied on a series of unsupported assumptions to conclude that its Preferred Alternative will provide the best balance of these six criteria. The evaluation of the alternatives is inconsistent and based on conclusions that cannot be supported by the site information or other documents. When those inconsistent statements are examined in detail and the site information correctly interpreted, USEPA's Preferred Alternative ranks *lower* than other alternatives for this Site.

III. Page-specific Comments to PRAP

PRAP Section: USEPA ANNOUNCES PROPOSED PLAN

Comment S-1
Page 1, 2nd Paragraph
*"The excavated soil would be treated, **if necessary**, prior to land disposal."*(Emphasis added).
Comment: USEPA should explain why no testing was done (or reported in the RI/FS) during the removal and remedial actions to establish whether treatment of the soil prior to disposal would be necessary. If appropriate testing had been completed during these prior efforts there would be less uncertainty regarding the limits of contamination and the scope and cost of remediation. On page 4-6 of the FS, USEPA states *"...it has been assumed that the arsenic in soil is leachable and will be characteristically hazardous for 50% of the excavated arsenic soil."* Similarly, on page 4-7 of the FS, USEPA states *"Discrete confirmatory sampling will be conducted to determine actual volumes of soil as well as potential hazardous waste characteristics."* If testing has been done, we request that this data and the interpretation of the data be provided for review.

PRAP Section: SITE HISTORY

Comment S-2
Page 2, 1st Paragraph
"Until at least 1940, various hide tanning, glazing and related operations were performed on this and neighboring lots."
Comment: USEPA should expand the discussion of the historic operations that took place on the Martin Aaron property and surrounding lots. USEPA also should include in the site history and conceptual model a discussion on the extensive use of arsenic in the tanning and slaughterhouse processes. Arsenic solutions were commonly used to soak the hides to remove the hair prior to tanning the hides. Historical documents indicate that solutions containing as much as one pound of dry arsenic per pound of water were used in the tanning process, and that the hides would soak in "vats" and or "barrels" until the solution became too weak to be effective. Arsenic solutions were also used to prevent the tanned hides from being destroyed by bugs and worms (See Exhibit C). As early as 1891, the property currently occupied by Comarco was owned and occupied by various abattoirs/provisional dealers (e.g. Mills Brothers) and leather shoe companies (e.g. Isaac Ferris Shoe Manufacturing). These facilities are shown on historic maps as having open cattle pens, slaughterhouses and coal-fired ovens. It also should be noted that until at least 1906, the former tanneries owned some of the property that is now occupied by the residential row homes along Jackson Street.

During the public meeting on July 26, 2005, USEPA stated that the presence of arsenic in the soil at the Martin Aaron Superfund site was likely associated with the use of arsenic for rodent control by the former tanneries. It is reasonable therefore to conclude that slaughterhouses, like tanneries, also used arsenic for rodent control, thereby contributing to the presence of arsenic in the soil in these areas. Furthermore, USEPA has attributed the PAHs detected at the Martin Aaron Superfund site to historic fill and/or coal from former tannery operations. The Sanborn maps document that the leather manufacturers and provisional dealers also used coal-fired ovens for heat and commercial purposes and therefore also would have contributed to the conditions in soil and groundwater at these locations.

USEPA should expand the discussion of how the history of the properties currently occupied by Martin Aaron, Comarco, the scrapyard and the residential homes may have contributed to soil and groundwater conditions independent of the Martin Aaron drum reconditioning operations. This should include the examination of historic aerial photos, historical maps (e.g. Sanborn maps) and other documentation. The historical record is extremely important where, as here, the Site has been impacted by multiple sources from various time periods. To understand the fate and transport mechanisms, the historical information must be factored in during the evaluation of the data, the development of the site CSM, the determination of RAOs and the identification and evaluation of remedial alternatives.

PRAP Section: SITE CHARACTERISTICS

Comment S-3
Page 4, 2nd Paragraph
"PAHs were generally higher on the Martin Aaron property than on other properties, with the highest concentrations in the former process and drum storage areas of the Martin Aaron operation. The earlier tannery operations would have used coal for heating and drying hides, and these same areas of the Martin Aaron property also coincide with former coal storage areas from this earlier operation."
Comment: USEPA has not demonstrated that a nexus (cause and effect relationship) exists between elevated PAH contamination in soil and the location of Martin Aaron drum reconditioning processes. Such a nexus, even if present, would not result from the Martin Aaron operations, but (as USEPA has correctly acknowledged elsewhere in the PRAP) from the operations that housed the furnaces and stoves for the tannery operations that were co-located with the Martin Aaron buildings. PAHs detected during the RI (such as benzo (a) pyrene and benzo (a) anthracene) are known to be products of coal and other fuel combustion. *"Their presence in the environment at higher concentrations is an artifact of habitation and is due to the widespread practice of emptying fireplaces, stoves, boilers, etc., in rural and urban areas over the past several hundred years."* (From Massachusetts Contingency Plan – Background Levels of PAHs and Metals in Soil, 5/02, Exhibit D).

Both the PRAP and RI document the presence of ash and cinders in the fill material in the area. USEPA should note in the FS and PRAP that in the early 1900s many industries used coal as a fuel source in their ovens, furnaces and boilers (as documented in the historic Sanborn maps). It is reasonable to conclude that the ash, cinders and resulting higher PAH levels in the soil are a direct result of the tannery operations that were present on the Martin Aaron property from approximately 1880 to 1940. Accordingly, we suggest USEPA include a statement in the RI, FS and PRAP that these historic operations would have had a direct impact on soils in areas beyond the Martin Aaron property.

The historical sources should be evaluated and the findings of such an analysis should be factored into the CSM. Only then should the USEPA proceed with its evaluation of alternatives.

Comment S-4
Page 4, 3rd Paragraph
"Higher concentrations of metals, particularly arsenic, were found in suspected source areas at the Martin Aaron property, which suggest that there may also be a site-related contribution of metals. Arsenic may be attributable to the drum reconditioning operations, but is also typically a remnant of tannery operations."
Comment: USEPA should identify the data that supports its position that the Martin Aaron drum reconditioning operations, as opposed to the tanneries, leather companies and provisional dealers, contributed arsenic to Site soils. Neither the RI, FS nor PRAP support USEPA's contention that "arsenic may be attributable to the drum reconditioning

operations...". Information available from USEPA files indicates that Martin Aaron operations were centered in the southeastern portion of the Martin Aaron property, immediately north of the Comarco property. This area does not have elevated levels of arsenic in the soil and groundwater. This would suggest that the Martin Aaron drum operations were not a source of arsenic.

There are numerous other USEPA Superfund Sites where former tanneries operating in the late 1800s and early 1900s have impacted soil and groundwater with arsenic and PAHs (see information on USEPA's website regarding Saco Tannery (Maine), Pownal Tannery (Vermont)). In January 2001, the State of Delaware Department of Natural Resources (DNREC) began *the "Tannery Sites Initiative Program"* which is a program designed to identify the contributions to soil from former tanneries located in central Wilmington. DNREC has concluded that many former tannery operations are responsible for the presence of arsenic and PAHs in soil and groundwater.

In addition to the historic tannery operations, we suggest USEPA include in the PRAP a discussion of the potential that other business operations contributed to area-wide contamination. Specifically, Kimble Glass Factory, formerly located where the current scrapyard exists, likely contributed arsenic to the soil and groundwater, as arsenic, barium and lead are well-known constituents in glass manufacturing. Also, Camden White Lead Works, which operated around 1900, is a likely source of metals to the soil and groundwater, as would be the former shoe leather manufacturers and slaughterhouses.

Comment S-5
Page 4, 6th Paragraph
"There is some correlation between SVOC concentrations and, for instance, the Martin Aaron building hot spot VOC area on the Martin Aaron property."
Comment: See Comment S-4. The higher concentration of SVOCs is also coincident with the location of the former tannery process buildings where coal-fired ovens, boilers and furnaces were operated. USEPA and other regulatory agencies have long-recognized the historic use of coal as an energy source has resulted in PAH contamination.

Comment S-6
Page 4, 7th Paragraph
"The metals appear to be attributable to "historic fill" material or from other sources at these sampling locations, with the exception of arsenic, which appears at concentrations as high as 23,300 ppm at the Martin Aaron building hot spot."
Comment: As mentioned in Comment S-4 above, the location where arsenic was detected at 23,300 parts per million (ppm) is coincident with the location of the former tannery buildings, in particular the "beam house", which is the primary tannery building. Martin Aaron, Inc. subsequently used that building (or parts of it). Furthermore, the 23,300 ppm cited by USEPA is from a subsurface sample, which would be more likely the result of historic operations as opposed to the more-recent Martin Aaron drum recycling activities. It is therefore misleading to associate the high arsenic concentrations with the so-called "Martin Aaron building hot spot"; rather it is more accurate to

associate these concentrations with the "former tannery beam house". Furthermore, USEPA has not provided any information in the Administrative Record to support the claim that Martin Aaron, Inc. contributed arsenic to site soils or groundwater.

Comment S-7
Page 5, 4th Paragraph
"Groundwater at the site generally moves to the southeast influenced by municipal pumping wells."
Comment: The RI does not provide any site-specific or direct evidence that the groundwater in the shallow water zone, the Upper PRM Aquifers or the Middle PRM aquifers are being currently influenced by any active municipal wells in the area. USEPA identified the presence of a municipal well approximately 1.75 east-northeast of the site which is an emergency water supply well that is not operational. If it were operated, it would be expected to influence the groundwater to flow to the east-northeast, not to the southeast, which is the current direction of groundwater flow. We suggest USEPA correct the PRAP or include in the RI the information that supports the contention that the groundwater at the Site is under the influence of municipal pumping wells.

Comment S-8
Page 5, 8th Paragraph
"Based on groundwater data collected from the RI, a VOC plume, comprised of cis-1,2-DCE, TCE, PCE and several other constituents, has been determined to be over 1,000 feet long and approximately 600 feet wide in the shallow wells (within the first 20 feet bgs)."
Comment: USEPA should explain in the PRAP that the wells located at the downgradient limits of the plume (but within the area of extraction) contain concentrations of VOCs that are less than USEPA's MCL Cleanup Goal for Groundwater and only slightly greater than NJDEP's Groundwater Quality Standards. For example, in Well MW-9S, which is the first off-site downgradient shallow well, the concentrations shown in Figure 5-45 of the RI Report are as follows:

- 1,2-cis-DCE = 23 ppb (No Cleanup Goal identified in Table 2).
- Tetrachloroethylene = 1.5 ppb (USEPA MCL Cleanup Goal in Table 2 = 5 ppb).
- Trichloroethylene = 1.7 ppb (USEPA MCL Cleanup Goal in Table 2 = 5 ppb).

In Well MW-20S, which is downgradient of Well MW-9S, Figure 5-45 of the RI Report identifies the concentration of trichlorethylene as being 1.6 ppb, which is below the USEPA MCL Cleanup Goal in Table 2 of 5 ppb, and only slightly greater than NJDEP's GWQS of 1 ppb.

In Well MW-11S, the furthest downgradient well from the site, the concentration of trichlorethylene shown in Figure 5-45 of the RI Report is 1.2 ppb, which is below the USEPA MCL Cleanup Goal in Table 2 of 5 ppb and only slightly greater than NJDEP's GWQS of 1 ppb.

Figure 4-10 of the FS illustrates USEPA's concept of the groundwater collection and treatment remedy (GW-5). In that figure, USEPA is proposing to install 3 groundwater extraction wells in the area of the plume where the above-listed monitoring wells document VOCs to be present at concentrations less than USEPA's MCLs or slightly greater than the NJDEP GWQS. These extremely low concentrations of VOCs do not warrant active treatment and the capital cost associated with the well and piping installation or the operational cost to manage and treat the groundwater. Furthermore, USEPA's proposal to extract groundwater in this area is not consistent with its own conclusions in the RI Report that natural attenuation processes for VOCs are occurring at the Site. For example, on page 6-6 of the RI, USEPA states "*The fairly strong relationship in relative concentrations between TCE and cis-1,2-DCE indicates that TCE is probably degrading to cis-1,2,-DCE. As concentrations of cis-1,2-DCE are now greater than TCE, the progression of this degradation sequence appears relatively advanced.*"

Comment S-9
Page 5, 9th Paragraph
"A smaller arsenic groundwater plume exists in the shallow aquifer, with concentrations decreasing with depth."
Comment: Figure 3 of the PRAP illustrates the concentration of arsenic in the groundwater at a concentration greater than 750 micrograms per liter (ug/l) or parts per billion (ppb), however the figure does not include the data from Well MW-13S. The RI Report provides data for two groundwater sampling rounds; June 2002 and September 2002. USEPA qualified the arsenic result for September 2002 due to data validation issues. The result for the June 2002 sampling event was determined to be valid. The concentration of arsenic in MW-13S in June 2002 was 6400 ppb. Based on this result, the limit of arsenic in groundwater should be reviewed and corrected. In addition, all calculations regarding the cost and scope of the groundwater remedy (i.e. number of wells, treatment costs, etc.) should be reviewed and corrected in the PRAP and FS before a remedy is selected. Furthermore, the June 2002 arsenic data from MW-13S establishes that arsenic impacts are site-wide (in all likelihood from the historic use of arsenic for tannery operations and rodent control and not related to the so-called Martin Aaron operational hot spots).

It is important to note that correcting the plume to reflect the June 2002 data in well MW-13S does not change USEPA's conclusion that the arsenic plume is stable and not migrating.

PRAP Section: SUMMARY OF SITE RISKS

Comment S-10
Page 6, 7th Paragraph
"The human health risk assessment evaluated exposure to surface and subsurface soils at the Martin Aaron property, the scrap-yard, and the properties adjacent to the facility under several exposure scenarios, including current trespasser exposure to surface soils,

future exposure to surface and subsurface soils by commercial/industrial workers and construction workers, as well as future use of groundwater as a potable water supply."
Comment: Groundwater in the Camden area is classified as a Class IIA aquifer and is considered a potential drinking water source. USEPA, however, acknowledged that the majority of the contamination in the shallow groundwater occurs within the upper 20 feet, the first 10 feet of which consists of historic fill (See Page 5 of the PRAP). This is an unlikely zone for the installation of a potable well due to issues associated with natural and background water quality conditions and yield. Furthermore, NJDEP regulations prohibit the completion of a well with a screen in the uppermost 20 feet. Other issues such as total dissolved solids, or other surface contributions to the shallow water-bearing zone preclude the use of this zone for potable uses without treatment. Finally, local and State ordinances may eliminate the drilling of potable wells within this localized area.

On page 2-5 of the FS, USEPA states *"There are currently no complete exposure pathways to contaminated groundwater beneath the Martin Aaron Site because there are no known contaminated wells in use. All resident in the area of the Martin Aaron Site are currently on city supplied water."* Also, during the remedial action phase, a Classification Exception Area (CEA) will likely be established which will prohibit the use of the groundwater in the foreseeable future.

Based on the information provided, USEPA's assertion that shallow groundwater in the area of the Site may be used as a future potable water supply is overstated and unrealistic. Therefore, it should not be used as a primary basis to select a groundwater remedy or to suggest that a costly pump and treat groundwater remedy is appropriate (as in Alternative GW-5).

PRAP Section: REMEDIAL ACTION OBJECTIVES

Comment S-11
Page 8, 3rd Paragraph
"Targets (referring to soil cleanup goals) were selected that would both reduce risk associated with exposure to soil contaminants to an acceptable level and ensure minimal migration of contaminants off the site."
Comment: USEPA has not provided the data or documentation that supports a conclusion that the cleanup goals selected by the agency for soil will *"ensure minimal migration of contaminants off the site"*. No information regarding a fate and transport analysis or other scientific analysis of contaminants in soil or groundwater was presented in the FS or the RI. We request that the agency provide the results of a scientific site-specific study that supports the agency's conclusion regarding the level at which compounds in soil will contribute to groundwater impacts.

USEPA has not provided the data or observations that support a conclusion that migration of contaminants in the soil is occurring off-site. USEPA's selection of RAOs to "ensure minimal migration of contaminants off-site" appears to be in direct contradiction to statements made by USEPA on page 6-5 of the RI, as follows:

"The overall decline in contaminant concentrations with time, from 1997 to 2002, in the Surficial Upper PRM Aquifer would suggest that the contaminant plume was receding over this time period."

In that same paragraph, the RI states:

"Typically, under receding conditions, the contaminant plume has expanded to a maximum extent."

USEPA should explain why target soil cleanup goals were selected to "ensure minimal migration of contaminants off the site" when its own RI Report concludes that the plume is receding and had reached its maximum extent.

Comment S-12

Page 8, 6th Paragraph

"Based upon communications with the City and other interested parties, including supporters of the Waterfront South redevelopment project, reuse expectations for the Martin Aaron property and neighboring properties are for commercial redevelopment."

Comment: USEPA's preferred alternative for groundwater, G-5 (extraction and treatment) will render portions of the Martin Aaron property (and perhaps adjacent properties) unsuitable for redevelopment for the foreseeable future (minimum of 10 years, by USEPA's own determination of the duration of alternative G-5). Analysis by McLane would indicate that a significantly longer time (on the order of 100 years) might be needed to remediate the arsenic in the groundwater through extraction (see Exhibit B). Alternative G-5 will require a treatment building of significant size (unlike what is portrayed in Figure 4-10 of the FS). Alternative G-5 will also require outside material and equipment storage areas, parking, site security, wells, underground piping, utilities, lighting and other components known to be needed to support a treatment plant capable of treating up to 100 gpm for metals and VOCs.

USEPA should re-examine its decision to select pump and treat in the context of the community's interest in having this site put back into productive use.

Comment S-13

Page 8, 7th Paragraph

"Soil contamination on the Martin Aaron property, the scrapyard, and on portions of Comarco Products and the Ponte property appear to be attributable to the Martin Aaron Superfund site."

Comment: The meaning of this statement is unclear and USEPA should clarify the intent of this statement. It is confounding to attribute contamination located on these properties to the Martin Aaron Site when these properties currently define the Martin Aaron Site.

If USEPA is attempting to attribute contamination on these properties from the Martin Aaron drum reconditioning operations, then USEPA should examine the historical air photos and Sanborn maps. These maps clearly show that by 1940, those portions of the Comarco property and Ponte property that have contamination are not readily accessible

from the Martin Aaron property due to the presence of major, multi-story buildings. This information was provided to USEPA prior to the issuance of the PRAP and is in the Administrative Record for review. With these substantial buildings present (which are know to have been built on concrete/brick subsurface foundations), there is no reasonable transport mechanism that would permit contaminants from the Martin Aaron drum reconditioning operations to migrate laterally in the unsaturated soil to the Comarco, Ponte and row home properties. It is reasonable to conclude that soil conditions in these areas are the result of pre-existing operations (e.g., tanneries, slaughterhouses) independent of and unrelated to the Martin Aaron drum recycling activities.

USEPA must re-evaluate its position regarding the source and attribution of soil contamination in light of the large volume of historical information, and revise the RI, FS and PRAP accordingly.

Comment S-14
Page 8-9, 2nd and 3rd Bullets

- *Remediate groundwater to the extent practicable and minimize further migration of contaminants in groundwater; and*
- *Restore the groundwater to drinking water standards within a reasonable time frame.*

Comment: These two RAOs appear to be in conflict with each other as to what is meant by *"extent practicable"* in the first bullet and *"reasonable time frame"* in the second bullet. It is believed, based on page 2-5 of the FS, that the first RAO is related to the "source areas" and the second to areas beyond the "source areas". USEPA should clarify the definition of these terms and correct the PRAP such that the public can have a correct understanding of the difference between these two RAOs.

In addition, the FS and PRAP fail to recognize background concentrations in groundwater when establishing site-specific groundwater cleanup goals. The State of New Jersey recognizes the presence of background contamination in determining the need for site remediation as follows:

> *"Groundwater that is contaminated shall not be required to be remediated to a level or concentration for any particular contaminant lower than the level or concentration that is migrating onto the property from another property owned and operated by another person." N.J.S.A. 58:10B-12g.(6).*

The concentration of arsenic in monitoring well MW-17S, which USEPA has interpreted to be upgradient of the Martin Aaron property (see Figure 4-8 of the RI (Potentiometric Surface Map, Surficial Upper PRM Aquifer, September 2002)), contained 584 ppb of arsenic in September 2002. Therefore, the remedial action goal for arsenic in groundwater at this Site should be no less than 584 ppb – the level of arsenic migrating onto the property from upgradient, off-site sources.

Also, it is not appropriate for the agency to issue a PRAP or an FS on the basis of the limited groundwater analytical data collected to date. Specifically, two rounds of groundwater samples collected in 2002 are insufficient to support the selected remedy. In addition, USEPA has neglected to account for the natural groundwater quality in the area.

The shallow Upper PRM aquifer is unsuitable for drinking without pre-treatment due to the historic impacts from the industrial development and use of the area. The natural occurring elevated levels of metals such as iron and manganese, in addition to the metals that are associated with historic fill throughout Camden, make it unrealistic to set "in-aquifer" remedial action goals as drinking water standards. It is inappropriate to establish drinking water remedial goals for this site while not requiring the same level of effort throughout the basin.

Comment S-15
Page 9, 1st Paragraph
"If contaminated groundwater is used as drinking water in the future, significant health risks would exist."
Comment: See Comment S-10.

Comment S-16
Page 9, 2nd Paragraph
"Groundwater within the source area must be remediated to the extent practicable. The presence of clay and silt stringers within the uppermost water bearing zone and high contaminant concentrations in groundwater (specifically arsenic), make it difficult to restore groundwater to the MCLs or the New Jersey groundwater quality concentrations (GWQCs) in the foreseeable future, even with active remediation of groundwater."
Comment: USEPA's preferred alternative for groundwater (G-5, Groundwater Collection and Treatment) states that *"it has been estimated that this system would be operated for 10 years to **restore** (emphasis added) the aquifer."* We request that the agency explain the apparent conflict between these two statements, as well as with others in the FS as noted in Comment G-4. We suggest that USEPA's recognition of the difficulty in restoring groundwater in the foreseeable future underscores the reason why the pump and treat remedy proposed by the agency is not the correct remedy. While this comment refers to the apparent contradiction in USEPA's statement, it is again noted that USEPA needs to re-evaluate its estimated time frame for aquifer restoration, as discussed by McLane (Exhibit A).

PRAP Section: SUMMARY OF REMEDIAL ALTERNATIVES

Comment S-17
Page 9, 5th Paragraph
"Alternatives S2 through S6 include the demolition of at least the Rhodes Drums building (the section on the Martin Aaron property)."
Comment: Figure 1 of the PRAP does not properly characterize the extent of the Rhodes Building. As USEPA has recognized in the PRAP, the Rhodes Drum Company only utilized the portion of the one-story building that is on the Martin Aaron property. Martin Aaron did not use the portion of the one-story building that is on the Ponte Property. We suggest the figure be annotated to clearly show the portion of the one-story building to be demolished.

The one-story building off of the Martin Aaron property is not shown as being owned by any entity in the legend. USEPA should identify the owner of this building and correct the figure.

PRAP Section: Alternative S-4 - Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils

Comment S-18
Page 11, 1st Paragraph
"This alternative includes excavation of approximately 28,000 cubic yards of both the VOC and arsenic Source Areas, transportation, and off-site disposal, with treatment as necessary to allow for land disposal. The unexcavated portions of the Martin Aaron site, an area of approximately 2.0 acres where soils exceed the direct-contact Cleanup Goals, would be capped as presented in Alternative S2 and S3."
Comment: On Page 1 of the PRAP, the Martin Aaron site is described as being 2.4 acres in size. The above statement indicates that approximately 2.0 acres of the Site will not be excavated, leaving approximately 0.4 acres is to be excavated. To obtain 28,000 cubic yards of soil from 0.4 acres would require excavation depths to over 40 feet – the FS assumes excavation to only 10 feet. We request that this apparent discrepancy between area and volume be clarified.

A review of the soil testing data in the RI indicates that a significant portion of those areas proposed for remediation do not contain contaminants above USEPA's source levels in the upper 5 feet of soil. USEPA has stated that further delineation is needed prior to remediation. Please confirm that USEPA will permit reuse of excavated soils that contain contaminant concentrations below the remedial action goal(s).

Comment S-19
Page 11, 1st Paragraph
"For cost estimating purposes, the FS assumed 30 percent of the excavated soil would undergo treatment prior to disposal."
Comment: It should be clarified in the PRAP that on page 4-7 of the FS, it was assumed that 50% of the soil containing arsenic greater than 300 ppm would require treatment. Since USEPA assumes that the total volume of soil requiring treatment for arsenic is 16,000 cubic yards, 8,000 yards would require treatment, which is approximately 30% of the total combined volume (28,000 cubic yards) of soil to be excavated for arsenic and VOCs.

As noted above, the existing soil data indicates that shallow soils in the areas proposed for excavation do not exceed the source area threshold levels and we request the agency confirm that these soils can remain on-site under the proposed asphalt cap.

Comment S-20
Page 11, 2nd Paragraph
"Excavated areas would be backfilled with clean fill."
Comment: See Comment S-20.

PRAP Section: Alternative S6 -Excavation and Of-Site Transportation of Residual Soils and Source Areas with Treatment as necessary prior to Land Disposal, Engineering Controls

Comment S-21
Page 11, 7th Paragraph
"The depth of excavation varies from two feet to a maximum of about 10 feet".
Comment: The FS is clear that the excavation depth of a Source Area is assumed to be 10 feet across the entire area. The FS does not contemplate that the depth of excavation will vary between 2 and 10 feet. USEPA should clarify if varying soil excavation depths were contemplated in the FS and on what data those varying depths were based.

Comment S-22
Page 12, 3rd Paragraph
"None of the groundwater alternatives would fully remediate the groundwater without an active soil remedy."
Comment: Neither the RI nor the FS provides scientific support of this statement. In fact, the RI provides and discusses direct lines of evidence to the contrary--that VOCs in the groundwater are undergoing remediation due to natural processes.

We request the agency clarify what is meant by "*fully remediate the groundwater*". In clarifying this statement, USEPA should recognize that the RI Report discusses upgradient sources of groundwater impact (background). Shallow wells MW-1S and MW-16S are located along the upgradient limit of the Martin Aaron property. Both wells show evidence of contamination, suggesting that there are upgradient sources of VOCs and metals (including arsenic) contributing to the overall groundwater conditions across the site. Other upgradient wells also show evidence of off-site sources of contamination.

USEPA should also re-evaluate the remedial action goal since the groundwater in the Camden area has been impacted by historical operations and fill material.

Comment S-23
Page 12, 6th Paragraph
"If an active soil remedy addresses the source areas, but no groundwater action is taken, VOC and arsenic plumes would still persist for a number of years (roughly estimated over 50 years)."
Comment: USEPA does not provide in the RI, FS nor PRAP how the agency determined an estimate of "*over 50 years*". To the contrary page 4-9 in the FS states "*There is evidence of biological reductive dechlorination of the CVOCs because of the presence of the degradation products cis 1,2-DCE and vinyl chloride.*" The RI provides a more thorough explanation of the conclusion that natural attenuation of VOCs is occurring at the Site.

Regarding arsenic, the FS provides on Page 4-10 that, *"Natural attenuation mechanisms for metals such as arsenic are much more limited because they are elements that do not degrade. However arsenic in groundwater is present in the more soluble reduced species. The arsenic would be expected to precipitate onto the aquifer matrix over time as the shallow upper PRM aquifer slowly returns to aerobic oxidizing conditions. The time for this to occur is dependent on the rate of oxygen and transfer to the shallow aquifer and the degree to which the oxygen will be utilized by microorganisms present in the aquifer to degrade organic substrates. The time needed for this to occur can be estimated based on natural attenuation data collected as part of this alternative."*

The agency has acknowledged that both VOCs and arsenic are capable of natural attenuation and the PRAP understates the conclusions on page 6-6 of the RI (i.e. "... *progression of this degradation sequence appears relatively advanced.*"). There needs to be more analysis performed before MNA can be eliminated as a remedy for groundwater. Elimination of this groundwater alternative without such study and analysis is premature and without scientific justification.

As McLane Environmental concludes, USEPA does not provide a scientific basis or reasonable explanation how the agency estimated the remedial time frames for some of the groundwater remedies (Exhibit B). For example, the PRAP states that MNA may take 40 years, however on page 4-10 of the FS the USEPA states *"The time needed for this (MNA) to occur can be estimated based on natural attenuation data collected as part of this alternative."* Accordingly, the FS acknowledges that the data necessary to estimate the MNA timeframe has not been collected. There are no calculations provided in the FS that support the timeframe cited by USEPA in the PRAP.

In the FS (page 5-10) USEPA estimates the mass of contaminants present in the water-bearing zone. Specifically, USEPA estimates that there are 9 lbs. of VOCs and 40 lbs. of arsenic in the upper PRM. Unsupported estimates translate into significant uncertainty relative to estimated remedial time frames and should not be used as a basis for remedy selection.

PRAP Section: Alternative G2 - Monitored Natural Attenuation (MNA) and Institutional Controls

Comment S-24
Page 13, 2nd Paragraph
"Studies performed during the RI indicate that natural attenuation of VOCs is probably underway."
Comment: See Comment S-23. USEPA recognizes natural attenuation is occurring at the Site. Without appropriate analysis, USEPA should not summarily dismiss natural attenuation as a stand-alone remedy for VOCs.

Comment S-25
Page 13, 2nd Paragraph
"The prospects for natural mechanisms to decrease the concentration or mobility of arsenic in groundwater are very limited."
Comment: The FS does not support this statement. To the contrary, on Page 4-10, the FS indicates that additional data needs to be collected before the natural attenuation time frame for arsenic can be estimated. USEPA should explain why the additional studies were not performed to further evaluate this option. These studies should be performed before a final remedy is selected.

PRAP Section: Alternative G3 - Containment with Hydraulic Controls

Comment S-26
Page 13, 9th Paragraph
"If coupled with an active source control remedy for the soils, preliminary calculations estimate a time frame of 20 years to completely remediate the aquifer."
Comment: Neither the RI nor the FS provide the scientific support for USEPA's preliminary estimated remedial time frame for this alternative of 20 years. Please provide the supporting documents and analysis that confirm the 20-year estimate. A final remedy should not be selected until these types of studies are performed.

PRAP Section: Alternative G4 - Geochemical Fixation and MNA

Comment S-27
Page 14, 2nd Paragraph
"Geochemical fixation involves introducing a polymer into an area with high arsenic concentrations."
Comment: As discussed by Parsons, the use of polymers (such as calcium polysulfide solutions) is only one type of in-situ geochemical fixation option (Exhibit B). Other sites containing arsenic in groundwater are using a solution of hydrogen peroxide and ferric chloride to immobilize this metal. We suggest USEPA evaluate the range of chemical fixation technologies that are currently being employed at other sites before the evaluation of this alternative can be considered complete. A final remedy should not be selected until these types of studies are performed.

Comment S-28
Page 14, 2nd Paragraph
"A pilot study to evaluate methods of distributing chemicals and resulting effectiveness would be required prior to full scale injection"
Comment: We concur that pilot studies should be conducted to evaluate this alternative prior to selecting alternative G-5, or another alternative.

Comment S-29
Page 14, 3rd Paragraph
"If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer."
Comment: Neither the FS, RI nor PRAP provide for review of the preliminary calculations that form the basis of the 40-year time frame. We request the agency provide them for review. Notwithstanding the existence of this data, USEPA should explain how time frames could be estimated without conducting the necessary pilot studies.

PRAP Section: Alternative G5 - Groundwater Collection and Treatment

Comment S-30
Page 14, 4th Paragraph
"In order to determine if chemical precipitation would be necessary, contaminant concentrations were estimated for the collection system discharge and compared against the CCMUA pretreatment limits. Arsenic was the only groundwater contaminant that may exceed the limits."
Comment: The details of the comparison mentioned in the PRAP are found on Page 4-11 of the FS.

Table 4-3 (Expected Groundwater Concentrations and POTW Discharge Limits) of the FS compares the expected contaminant values in the groundwater to the proposed treatment plant and the POTW discharge limits. The FS states "*All of the VOCs detected in groundwater at the Site are below the CCMUA limits.*" However, Table 4-3 does not identify the POTW limits for VOCs. In addition, the FS states that pretreatment for inorganics might not even be necessary based on the evaluation in Table 4-3.

The evaluation provided in Table 4-3 involves calculating the <u>*average*</u> concentration of each compound from 19 wells at the Site and comparing those averages against those anticipated as POTW limits. This evaluation is misleading, since not all of the wells included in the average calculation are within the areas identified for groundwater extraction. For example, the "expected" influent concentration for arsenic is calculated in the FS to be approximately 754 ug/l. However, when only those wells near the proposed extraction wells are used in the average (Wells MW-1S, 5S, 13S, 15S, 16S and 17S), the average arsenic concentration is 2335 ug/l -- twice the POTW limit shown in the table. This would suggest that the scope and cost of the pump and treat alternative is underestimated.

A CCMUA POTW Effluent Limitations Table from another Superfund site in Camden County was compared against the groundwater data for the Martin Aaron site. In addition to arsenic, cadmium and lead are present in the groundwater at the Martin Aaron Site at concentrations that exceed this other site's permit and would require treatment prior to discharge. USEPA should use an existing permit for evaluation of the potential

need for pretreatment. The FS and PRAP should be corrected to use existing permitted discharge limits, rather than "expected" limits.

Additionally, the CCMUA may require flow control on the amount of water acceptable for discharge. Flow control has a direct impact on the duration of any remedy.

Comment S-31
Page 14, 6th Paragraph
"If combined with an active soil remedy to address the Source Areas, it has been estimated that this system would be operated for 10 years to restore the aquifer."
Comment: No calculations or assumptions that support this statement are provided in the RI, FS or PRAP for public review. We suggest the analysis be provided so that the public can complete a thorough evaluation of the PRAP.

There are few (if any) Superfund sites in the country where groundwater extraction and treatment has restored the aquifer in 10 years, and many have operated well beyond the estimated duration.

PRAP Section: EVALUATION OF ALTERNATIVES

Comment S-32
Page 15, 1st Paragraph
"Alternative S2 relies primarily on capping and institutional controls to meet the remedial action objectives and does little on its own to address the arsenic and VOC hot spots."
Comment: On page 2-5 of the FS, one of USEPA's RAOs is to "*remediate contaminated soils to control leaching.*" The RI and FS further explain that the mechanism to transport residual VOCs and arsenic to the groundwater is by infiltration of surface water. On page 4-2 of the FS, a multi-layer, low permeable asphalt capping systems is described with the objective of "*minimizing infiltration in the areas where leaching is of greatest concern.*" This is not the capping system USEPA presented in Alternative S-2 of the PRAP, which is a single-layer asphalt capping system designed to eliminate direct contact. We request the agency explain why the multi-layer capping system described in the FS was not carried forward into the PRAP as an alternative that achieves the RAOs for soil.

Comment S-33
Page 15, 3rd Paragraph
"...none of these alternatives are expected to remediate the groundwater without the aid of a complimentary soil remedy that addresses the soil Source Areas."
Comment: As mentioned in prior comments, USEPA has not provided for review the results of any scientific testing or evaluation that demonstrates levels of VOCs and arsenic in soil which are contributing to groundwater conditions.

Comment S-34
Page 15, Paragraph 9
"Depending upon the selected soil remedy, the most highly contaminated arsenic in groundwater would not recover in a reasonable time frame."
Comment: There appears to be an inconsistent presentation in the PRAP on what USEPA considers to be a "reasonable time frame" for remediation.

- On Page 14, 3rd Paragraph, USEPA states "If coupled with an active source control remedy for the arsenic-contaminated soils, preliminary calculations estimate a time frame of 40 years to completely remediate the aquifer."
- On Page 17 of the PRAP, USEPA states "Alternative G2 would reach the Cleanup Goals in 45 years, through natural attenuation, after the source is removed."
- On Page 19, US EPA states "With the removal of VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame."

Since USEPA believes that VOC impacted groundwater can be cleaned up in a reasonable time period (i.e. 45 years) it should explain why a 40 year clean up time period for arsenic is not also considered to be reasonable.

Comment S-35
Page 16, 2nd Paragraph
"In addition, the presence of clay and silt lenses within the shallow aquifer will make restoration difficult, especially for arsenic, since metals tend to sorb onto clay particles making them difficult to remediate."
Comment: This statement appears to contradict USEPA's representation that groundwater extraction for arsenic remediation will achieve the RAOs in approximately 10 years. The absorptive nature of arsenic to clay particles renders the arsenic immobile, which explains why the arsenic plume is limited in areal extent despite the fact that tannery operations ended at the site more than 75 years ago. The plume is static which contradicts the agency's representation in the PRAP that a "more aggressive" remedy for groundwater is necessary (i.e. groundwater extraction compared to natural attenuation).

Comment S-36
Page 16, 3rd Paragraph
"Alternative G4 (Geochemical Fixation and MNA) ranks higher than Alternatives G3 (Hydraulic Containment) and G5 (Collection and Treatment) for the arsenic plume because the arsenic is quickly treated after injection, curtailing or eliminating mobility."
Comment: In the PRAP, USEPA makes the case that arsenic contamination in groundwater may be difficult to remediate (see comment above). The concentration of VOCs and their propensity to remediate through natural attenuation strongly suggests that the groundwater remedy for the Site should focus on arsenic. We request the agency explain why Alternative G4 should not be the Preferred Alternative, or at a minimum, more fully evaluated before selecting a more costly and likely longer-term remedy such as pump and treat.

Comment S-37
Page 17, 2nd Paragraph
"Alternative G4 employs a treatment technology, geochemical fixation, that reduces the toxicity and mobility of arsenic, though it does not address the VOC contamination."
Also,
"Alternatives G4 and G5 offer a comparable level of improvement in mobility and toxicity reduction..."
Comment: With respect to arsenic remediation, USEPA ranks Alternative G4 equal to or higher than G5, yet chooses G5 as the Preferred Alternative. We request the agency explain why Alternative G4 should not be the Preferred Alternative, or at a minimum, more fully evaluated before selecting a more costly remedy such as pump and treat.

As previously mentioned the areas of VOC contamination and elevated arsenic in groundwater generally do not overlap. Therefore, different approaches can be applied to the VOC and arsenic plumes.

Comment S-38
Page 17, 9th Paragraph
"Alternatives G3 and G5 have minimal impacts with respect to the protection of workers, the community, and the environment during remedial construction."
The installation of wells, piping, and a treatment facility will significantly impact the local community during remedial construction. For example, Alternative G5 will require extensive excavation in the area and streets, the closing of streets, interruption of utilities and noise.

Comment S-39
Page 18, 3rd Paragraph
"Alternative G4 will require studies to determine a proper chemical dose and mixing needs for precipitation of arsenic. The uncertainties regarding implementability are considered high for Alternative G4, relative to all other groundwater alternatives."
Comment: See General Comment G-4. USEPA has overstated the uncertainties associated with this technology without basis (e.g. treatability studies) and underestimated the uncertainties of its Preferred Alternative, G5.

PRAP Section: Community Acceptance

Comment S-40
Page 18, 6th Paragraph
Comment: USEPA has recognized the community's interest in seeing the Martin Aaron property and adjacent areas redeveloped and placed back into productive use. However, the agency's selection of groundwater alternative G5 will restrict the potential for the Martin Aaron site to be redeveloped in at least the next 10 years because:

- The treatment building will require at least ½ acre of space;
- An additional ¼ to ¾ acre will be needed for parking, material storage, equipment storage and deliveries of consumable materials;
- The pipelines connecting the wells to the building will be placed in trenches. As shown in the FS, absent any development plans, these pipelines will go directly from

the well(s) to the building. Construction of any buildings that require a foundation of utilities will be constrained by the presence of these pipelines.

- Wells and pipelines will need to remain accessible for maintenance and/or replacement.
- The wells and treatment building will need to be placed within a security fence not only for equipment protection, but to protect the community from the operating equipment, chemicals and sludge from the precipitation process.
- Delivery trucks and trucks to remove the sludge from the treatment plant will need to have access at all times to the building.

For these reasons (and others), USEPA should thoroughly examine all of the potential impediments associated with Alternative G5 and the long-term impacts on the community and the community's ability to reuse this area.

PRAP Section: Summary of the Preferred Alternative

Comment S-41
Page 18, 11th Paragraph
"The Preferred Soil Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal, and is expected to allow the site to be used for its reasonably anticipated future land use, which is commercial/industrial."
Comment: USEPA has not demonstrated through pilot testing or treatability testing that in-situ soil stabilization for arsenic or in-situ chemical fixation for arsenic in groundwater will not achieve these same objectives quicker, safer and less-costly.

Comment S-42
Page 18, 11th Paragraph
"Although S3 and S5 were similar is some respects, Alternative S4 was chosen because it has fewer uncertainties in addressing the Source Areas at a comparable cost."
Comment: USEPA has concluded that in-situ technologies such as soil stabilization for arsenic or chemical fixation of groundwater for arsenic have an unacceptable degree of uncertainty. Traditionally, that uncertainty is addressed by the implementation of bench scale and/or pilot studies, none of which USEPA has conducted for this Site. All remedial technologies, by their very nature have some degree of uncertainty, including USEPA's selected soil excavation alternative.

With regard to cost, Alternative S-4 is estimated to cost $6,580,000 and Alternative S-3 is estimated to cost $3,630,000. At a difference of nearly $3,000,000, it is not clear how these alternatives can be implemented at a "*comparable cost*". Therefore, USEPA should provide additional details as to why it has selected an alternative that apparently was rated equal to other alternatives in most respects.

Comment S-43
Page 19, 2nd Paragraph
"While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations in a relatively short time frame (estimated at 10 years).
Comment: USEPA has not explained why the remediation of groundwater for VOCs requires "speed", especially since the groundwater is not currently being used for drinking water, is unlikely to be used for drinking water in the foreseeable future, and may likely be restricted by existing local code from use as a drinking water source. Moreover, the RI clearly concludes that natural attenuation of the VOCs in groundwater is occurring and *"the progression of this degradation sequence appears relatively advanced."*(RI Page 6-6).

The agency has made the assumption that extraction and treatment of groundwater for arsenic will take a relatively shorter timeframe than in-situ chemical fixation. The agency has not conducted any bench scale or treatability tests to determine the effectiveness of in-situ chemical fixation at this Site. In-situ chemical fixation of arsenic in groundwater has been shown to be a relatively quick and cost-effective alternative at other sites. Furthermore, the agency cautions in the PRAP in this same paragraph that *"...certain site factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination, may limit the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame."* This type of uncertainty with groundwater extraction underscores the need to fully evaluate in-situ chemical fixation, which would not require groundwater pumping and not face the risk of dewatering the aquifer. It also illustrates how the selected alternative may render the aquifer unusable (due to dewatering) in a short-time frame.

Given these apparent contradictions, USEPA must explain why more work was not performed to answer the very serious questions regarding the effectiveness of the pump and treat option.

EXHIBIT A

Comments Regarding Site Data and Technical Issues Related to Remedial Investigation, Feasibility Study, and Proposed Remedial Action Plan for Martin Aaron Superfund Site, Camden, New Jersey, September 2005, prepared by McLane Environmental, LLC

Comments Regarding Site Data and Technical Issues Related to Remedial Investigation, Feasibility Study, and Proposed Remedial Action Plan for Martin Aaron Superfund Site Camden, New Jersey

Prepared for
Martin Aaron PRP Group

Prepared by
McLane Environmental, LLC
Princeton, New Jersey

September 2005

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1.0 Introduction

At the request of the Martin Aaron PRP Group (the Group), McLane Environmental, LLC (McLane Environmental) has reviewed documents and data related to the Martin Aaron Superfund Site (the Site) in Camden, New Jersey including the December 2004 Remedial Investigation (RI) (USEPA 2004), July 2005 Feasibility Study (FS) (USEPA 2005a), and July 2005 Proposed Remedial Action Plan (PRAP) (USEPA 2005b) prepared by the United States Environmental Protection Agency (EPA), and other materials relating to the Site and surrounding area.

Based on this review, McLane Environmental has identified a number of technical issues and concerns surrounding EPA's collection and interpretation of site data, the site conceptual model formulated by EPA, and EPA's proposed remedy for the Site. In reviewing and commenting on EPA's site investigation and remedy planning work for the Site, McLane Environmental has drawn on information contained in site reports, information and data from hydrogeologic studies conducted by authoritative agencies such as the United States Geological Survey, EPA's own guidance regarding such topics as natural attenuation and pump and treat ground water remediation, and on our experience in analyzing the hydrogeologic conditions of the Potomac-Raritan-Magothy (PRM) aquifer that underlies the Site. Our comments on these technical issues are discussed in the sections below.

2.0 Overview

The USEPA RI (USEPA 2004) and FS (USEPA 2005a) reports and the PRAP (USEPA 2005b) issued for the Site present a variety of erroneous depictions and descriptions of the site geology and hydrogeology. This faulty hydrogeologic site conceptual model is coupled with (1) a lack of site geochemical data that would be necessary to understand the processes controlling the fate and transport of metals in soil and ground water at the site, (2) a lack of quantitative information on the likely rate of degradation of volatile organic chemicals (VOCs), (3) no detailed characterization of the properties or heterogeneity of soil materials requiring remediation, (4) no treatability/pilot testing of applicable soil and ground water remedies, (5) no depiction of the distribution in ground water of individual VOCs above applicable standards, (6) no presentation of a quantitative hydraulic analysis of the likely capture effectiveness of the proposed pump and treat extraction well system, (7) no presentation of a quantitative analysis of natural attenuation processes in the aquifer beneath the site that could successfully mitigate VOC contamination, and (8) no discussion of the technical basis for the myriad variable, vague, and in several instances conflicting estimates of remediation time for site ground water.

These errors and omissions would appear to leave EPA with essentially no reliable basis for selecting a soil and ground water remedy for the site at this time. Additional site hydrogeologic and chemical data, which are routinely and fairly easily collected, are needed prior to the selection of soil and ground water remedies for the Martin Aaron site. Based on an evaluation of the proposed remedy in light of site conditions, particularly the proposed pump and treat remedy for arsenic in ground water, we conclude that the remedy proposed by EPA has a high likelihood of failure to meet cleanup standards within the timeframes presented in the PRAP (USEPA 2005b).

A summary of technical findings and comments derived from McLane Environmental's review of site hydrogeology and geochemistry data, as well as an evaluation of the proposed pump and treat remedy is presented in the following sections.

3. Hydrogeology and Site Conceptual Model

3.1 Surficial Upper PRM

A review of boring log information and soil sampling data for the Site contained in the RI (USEPA 2004) revealed that, while they provide some information on conditions in the unsaturated soil zone, they do not adequately characterize the nature and properties of the soil and fill material to the degree necessary to support some of the statements and decisions documented by EPA in the FS (USEPA 2005a) and the PRAP (USEPA 2005b). No grain-size analyses are presented, and there are no detailed characterization data for the materials that comprise the fill zones at the Site. There appears to be no documented quantitative basis for EPA's assignment of higher uncertainty to several of the soil remedial alternatives that were evaluated in the FS (USEPA 2005a) and rejected.

The review of the boring logs also indicates that many of the monitoring wells in the surficial unit are installed on top of, or within, a zone of silty-clay and fill across the Site (Attachment 1). The water zone measured and sampled by these wells is likely perched water. The presence of a perched zone is a highly important factor that controls contaminant movement and recovery, yet it is one that is not mentioned by EPA. The evidence for, and implications of, this perched water zone with respect to the formation of the site conceptual model and selection of a ground water remedy are discussed in the remainder of this section and developed further in Section 6.0 below.

Information derived from the boring logs for eight wells, MW-12S, MW-13S, MW-14S, MW-15S, MW-16S, MW-17S, MW-18S and MW-19S (Attachment 1), clearly indicates that these wells were completed in multiple, laterally discontinuous layers of lower permeability silty-clay materials interbedded with sand layers or lenses. In certain instances the boring log for one well shows first water at a shallow elevation, while a nearby well shows first water at least 10 feet deeper.

Water level measurements in the eight wells mentioned above likely represent perched conditions. This means that EPA erred in combining data from these wells with wells completed entirely within the Upper PRM. Therefore, the horizontal and vertical hydraulic gradients derived from these eight wells are not representative of the Upper PRM aquifer. For example, Figure 4-8 in the RI (USEPA 2004) indicates fairly steep horizontal hydraulic gradients as large as 0.029 to the southeast. Similarly, Table 4-1 in the RI (USEPA 2004) lists a mix of relatively large downward vertical gradients with essentially neutral vertical gradients, and the text associates this range of gradients with the Upper PRM aquifer.

Mapping of the vertical gradient data for the network of monitoring wells on and in the vicinity of the Site revealed a clear pattern in which the greatest downward vertical head differentials were observed in the northwest portion of the monitoring well network (e.g.

MW-17S and MW-01S), with lower downward vertical head differentials in the center portion of the network (Attachment 2). In the southeast corner of the monitoring well network southeast of the Martin Aaron property , the vertical head differential disappears (e.g. MW-09S, MW-20S, and MW-11S). This indicates strongly perched conditions in the northwest portion of the monitored area, lessening in severity to the southeast. It also demonstrates that the shallow monitoring wells in the central and northwestern portion of the Site should be excluded from any determination of horizontal and vertical hydraulic gradients for the Upper PRM aquifer. EPA has confounded the depiction of the flow system by including this mix of perched zone and aquifer water level data in their efforts to depict the hydraulic gradients and to formulate this element of the site conceptual model.

Another outcome of the installation of the monitoring wells in silt and clay zones is that the hydraulic testing of these wells yielded very low estimates of aquifer hydraulic conductivity. Hydraulic conductivity values averaging 0.3 ft/d estimated by EPA in the RI (USEPA 2004) from slug tests conducted in these wells are uncharacteristically low, and are not representative of the PRM aquifer. However, they may indicate the low-permeability nature of the perched zone, a factor that EPA has not properly weighed in selecting a pump and treat ground water remedy for this site as discussed in Section 6.0.

In addition, water quality data from these monitoring wells do not represent contamination conditions in the PRM aquifer, but rather in the shallow perched water zone. The hydraulic connection between the perched zone and the PRM aquifer has not been adequately characterized. However, it is likely that the contamination in the perched zone will eventually drain to the Upper PRM with implications for substantial prolongation of the pump and treat remedy as discussed in Section 6.0.

The value of the data obtained from these wells in characterizing the ground water aquifer and planning the ground water remedy in general, and specifically in selecting a pump and treat remedy, is questionable. The horizontal gradients depicted in the RI (USEPA 2004) are too steep. The vertical hydraulic gradients cannot be used to estimate downward flow in the aquifer. Instead they represent the potential for leakage from the perched layer (which is never explicitly identified as a perched layer in EPA's incomplete conceptual model), but the nature of this leakage or its potential impact on the planned ground water remedy cannot be determined because the extent and properties of the perching layer were not properly characterized in EPA's investigation.

3.2 Upper PRM

Hydraulic conductivity estimates reported in the RI (USEPA 2004) for the Upper PRM appear to be uncharacteristically low. Values reported in the RI average approximately 5 ft/d. Peer-reviewed studies have reported hydraulic conductivity values generally ranging from 35 ft/d to 400 ft/d, with the most representative values for the Upper PRM being in the range of 50 to 100 ft/d (e.g., Pope et al. 2004, 2005; Schreffler 2001; Spayd and

Johnson 2003). This means that EPA's estimate of hydraulic conductivity for this unit is too low by a factor of 10 to 20. The low EPA estimates could be the result of improperly developed monitoring wells, problems with the slug testing, or improper interpretation of the slug test data. If actual hydraulic conductivity is greater than EPA's low estimates, the extraction well capture zones may be smaller than EPA anticipated such that the wells fail to adequately capture on-site and off-site contaminated ground water as discussed in Section 6.0.

4.0 Site Geochemistry

4.1 Geochemical Data and Conditions

A review of the site geochemical data contained in the RI (USEPA 2004) and FS (USEPA 2005a) revealed numerous data deficiencies and unexplained trends that contribute to the overall deficiency of the conceptual model that EPA has formulated for this site (Attachment 3).

Oxidation-Reduction State of Arsenic
Geochemical data reported in the RI (USEPA 2004) are insufficient to provide a complete understanding of the speciation of arsenic in soil and ground water. The chemical form in which arsenic resides in soil and ground water is very important in governing its mobility in the environment. As one notable example, no oxidation-reduction potential (ORP) data were collected during any of the studies conducted at this site. These data would have been very useful in attempting to determine the form(s) and mobility of arsenic present in soils and ground water beneath the Site, and would also have been helpful in evaluating CVOC fate and transport.

Surficial Upper PRM Geochemical Conditions
Geochemical data for the Surficial Upper PRM present a consistent pattern and tend to indicate that reducing conditions may be present, potentially resulting in increased (but still limited) chemical mobility and slightly increased concentrations of arsenic in ground water in this area. It is important to keep in mind that actual arsenic mobility in the aquifer will still be governed by the hydrogeologic properties (low hydraulic conductivity silts and clays) of the shallow perched zone, as discussed above.

Upper PRM Geochemical Conditions
Geochemical data for the lower portion of the Upper PRM present a problematic pattern in which dissolved oxygen and dissolved iron concentrations are greater than those in the shallow aquifer zone. This indicates possible problems with the sampling data (such as oxygen diffusing into sampling lines) or a significant unexplained difference in chemistry between the perched zone and the Intermediate Upper PRM. This has implications for both arsenic transport and CVOC attenuation. The differences in geochemistry between the Surficial and the Intermediate Upper PRM are not consistent with the site conceptual model developed by EPA, which supposes a direct vertical hydraulic and dissolved chemical connection between shallow and intermediate zones (see for example Figure 6.30 in the RI – USEPA 2004).

4.2 Mobility and Attenuation

Significant natural attenuation of CVOCs is occurring in soil and ground water at the Site. While soils contain concentrations of PCE and TCE exceeding 1 mg/kg, PCE and TCE are virtually non-existent in the ground water samples. The CVOCs present are primarily degradation products of PCE and TCE. The breakdown of PCE and TCE into

daughter products is consistent with the geochemical conditions present in the Surficial Upper PRM, and indicates that significant attenuation of CVOCs is occurring in the subsurface at the site.

Site geochemical data and contaminant sampling data indicate that arsenic is not likely to be highly mobile in ground water in the vicinity of the Site. The presence of significant concentrations of iron, typical of the PRM aquifer system, and the oxygenated conditions observed in the Intermediate Upper PRM will provide a substantial sorption attenuation mechanism for arsenic in this zone. The orders of magnitude decrease in arsenic concentration between the Surficial and Intermediate Upper PRM aquifers is evidence of either a significant attenuation mechanism in this area or a substantial flaw in EPA's conceptual site model.

5.0 Distribution of Contamination in Ground Water

5.1 USEPA Maps Depicting Distribution of COCs in Site Media

Arsenic in Ground Water
A review of the depiction of arsenic in shallow ground water presented in Figure 2-11 in the FS (USEPA 2005a) revealed that the arsenic concentration at monitoring well MW-13S was depicted as less than 10 ppb despite the fact that a concentration of 6,400 ppb was determined during the June 2002 sampling event, and a similar value was determined but rejected (reasons unknown) during the September 2002 sampling event. This discrepancy should be investigated and explained by EPA.

A check of the arsenic ground water sampling data (including the MW-13S 6,400 ppb value discussed above) against the zone of arsenic in ground water > 750 ppb as depicted in Figure 2-10 indicates that the EPA depiction likely underestimates the area of ground water that may eventually require remediation for arsenic (and thus the time and costs).

In addition, there are no maps provided that show the arsenic plume in vertical profile. This important depiction would illustrate the relationship between high arsenic concentrations and incidence of perched zones.

VOCs in Ground Water
Both the RI (USEPA 2004) and the FS (USEPA 2005a) depict the extent of VOCs in ground water (1) showing total volatile organic compounds (TVOCs) only, and (2) depicting only the boundaries of impacted zones with no concentrations or contours for individual VOCs. These "plume maps" do not form a technically sound basis upon which EPA could evaluate natural attenuation as parent compounds are degraded and transformed to other daughter compounds, nor does it provide a sound technical basis upon which to select and design a ground water remedy that will be required to remediate ground water to compound-specific cleanup standards. VOC-specific plume maps along with maps showing the VOC plume in vertical profile, are critically important.

5.2 Background Concentrations / Off-Site Contamination

VOCs
As EPA acknowledges in RI page 6-3, and RI page 10-2 (USEPA 2004), sampling data for BTEX in ground water from wells MW-17S and MW-18S indicate possible migration onto the Martin Aaron property of dissolved petroleum compound contamination in ground water from an upgradient off-site source. As discussed in the RI text and depicted in Figure 6-9, there is likely an off-site upgradient source of MtBE impacting the Site.

Geochemical Data
A review of geochemical data reported in the RI (USEPA 2004) indicates possible other impacts to on-site ground water from upgradient source(s) (Attachment 3). Although many of the contour maps drawn by EPA indicate that changes in geochemical conditions

initiate on site, the altered conditions are in fact present in the upgradient wells, indicating that they may have originated upgradient of the site. For example, elevated dissolved iron and depleted dissolved oxygen are present in the Surficial Upper PRM wells on the upgradient boundary, potentially indicating an upgradient impact resulting in these geochemical conditions.

Arsenic

Data from MW-1S, MW-5S, MW-16S, and MW-17S depicting arsenic in ground water indicate possible migration onto the Martin Aaron property of dissolved arsenic in ground water from an upgradient off-site source.

6.0 Effectiveness of Proposed Pump and Treat Remedy

EPA in its own technical information and regulatory guidance documents identifies many factors that can reduce the efficiency, prolong the cleanup time, and increase the cost for pump and treat ground water remedies (USEPA 1992a, 1992b, 1994, 1996a, 1996b, 1997, 2003). These factors include improper location or depth of well systems that cause a spreading of the contamination, or because the wells fail to properly capture the zone of ground water contamination. The factors also include the presence of low permeability zones that can separate contamination from the hydraulic effects of the extraction wells and partially immobilize or sequester dissolved contamination; the slow cleanup that often results for strongly sorbing compounds (e.g. metals like arsenic); and several other factors. It appears that EPA's improper site conceptual model, its failure to consider the likely effects of the more highly contaminated perched water zone, its failure to fully characterize and consider the likely effects of arsenic chemical adsorption, and its faulty basis for conceptual design of the ground water extraction system have created a situation for the Martin Aaron site in which the ground water remedial system will fail. The failure will occur for reasons that EPA has incorporated into its own guidance.

6.1 Shallow versus Deeper Contamination

Site data presented in RI, section 5.4 (USEPA 2004) indicate higher (> 1 ppm) levels of arsenic in ground water in the surficial zone and silty-clay units, with lesser (approximately 100 ppb) levels of arsenic in ground water in the Upper PRM aquifer. Thus, as EPA acknowledges in the PRAP (USEPA 2005b), the majority of the contamination resides in the shallow zone. As pointed out throughout these comments, it is this zone of contaminant concentration that geologic, hydraulic, and geochemical data indicate is perched; a concept not recognized by EPA.

Extraction wells extending to a depth of 50 feet will primarily draw water from the less contaminated zone beneath the perching layer while leaving the perched zone as a high concentration, long-term source to underlying ground water. This will effectively spread the contamination vertically, extending the zone of ground water contamination.

Also, to the extent that remedial pumping acts to dewater the surficial zone, saturated horizontal flow and flushing of arsenic and VOCs from this zone will be prevented, thereby inhibiting cleanup and increasing the chance of concentration rebound when the system is shut off for some period of time. This would significantly increase the duration and the cost of the ground water remedy.

6.2 Extraction System Well Capture Zones

No clear technical basis is provided in the FS (USEPA 2005a) and PRAP (USEPA 2005b) for the conceptual design of the collection-and-treatment ground water remedy proposed by EPA (USEPA 2005a, Section 4, Figure 4-10). If no design calculations were

performed (and none are described in the FS or PRAP), then EPA has no basis for the system design, extraction well number and layout, ground water pumping and treatment volumes, nor any basis for the ground water remedy cost estimate.

On the other hand, if conceptual design analyses were performed, they were likely based on the uncharacteristically low hydraulic conductivity values reported in the RI (USEPA 2004) for the Site (see discussion in Section 3 above). This would lead to an erroneous design.

For example if the hydraulic conductivity values used in design calculations were 10 times lower than the actual PRM aquifer values, then the capture zone for each well in operation will be approximately one-tenth of that predicted by the design calculations. The planned array of extraction wells will likely not completely capture contaminated on-site and off-site ground water.

A greater number of wells, and/or greater pumping rates would be required to obtain complete capture. This would result in greater volumes of ground water being extracted and treated, and would substantially increase the cost of the ground water remedy over that estimated by EPA. This also increases the likelihood of quickly dewatering the shallow perched zones where most contamination is located, removing from the influence of the pump and treat system most of the contaminants it is designed to address.

6.3 Estimated Cleanup Time

EPA presents no analyses to support the design and no calculations to support its assertion that, for the selected remedy, ground water would be remediated to concentrations below standards within 10 years (USEPA 2005a page 4-14). For a strongly sorbing metal such as arsenic, this estimate does not appear to be within the realm of possibility.

As a check on EPA's estimate, a simple dissolved plume volume flushing calculation was performed (Attachment 4). The analysis was performed using the method of Zheng (1992) as described by EPA (USEPA 1994, 1997). The calculations, which are based in part on an estimated retardation factor for arsenic of 90 (USEPA 1996c) indicates that hundreds of years will be required to attain cleanup of arsenic in ground water for the proposed pump and treat system. As EPA points out (USEPA 1994, 1997), because of the simplifying assumptions used in the flushing analysis, this likely represents an underestimate of the actual cleanup time.

Similar pore volume flushing calculations for site-related VOCs (PCE, TCE, DCE, and VC) indicate less than 10 years would be required for a flushing rate of approximately one plume volume per year (Attachment 5). In this calculation, while the assumption of no degradation may slightly overestimate cleanup time, the well-mixed reactor assumption may underestimate actual cleanup time to a greater degree.

To obtain a more accurate estimate of potential time to arrive at VOC cleanup via natural attenuation (NA) processes, a simple plume transport model was developed and executed to simulate the natural flushing of site-related VOCs (PCE, TCE, DCE and VC). The model assumed that the VOC source is removed and the dissolved plumes are allowed to attenuate for conditions of advection, adsorption, degradation, and no input of mass from parent compound decay (not unreasonable given the relatively low VOC concentrations).

The results indicate that, following source control, cleanup of dissolved VOCs via natural attenuation will occur within approximately a 20-year timeframe, with off-site low-concentration VOC-contaminated ground water zones likely attaining target levels in significantly less time than the on-site plume areas. These analyses suggest that NA processes could effectively reduce ground water concentrations of these compounds within a reasonable timeframe

7.0 Conclusions

The geologic, hydrologic, geochemical, and remedy evaluation information contained in USEPA's RI (2004), FS (2005a), and PRAP (2005b) show numerous instances in which key data are missing, other instances in which data are misinterpreted, and yet other instances in which data directly relevant to the performance of a remedy appear to have been ignored. Soil and fill materials were not characterized sufficiently to support the remedy evaluation statements made in the FS (USEPA 2005a) and the PRAP (USEPA 2005b). Monitoring wells intended to sample ground water were installed in the silty-clay materials of a perched zone, such that it is difficult to interpret both the water level and water quality data from these wells. Key geochemical data including oxidation-reduction potential and arsenic speciation data, as well as quantitative data that would permit a determination of the mechanism and rates of natural attenuation processes were simply not collected.

While ground water cleanup standards for individual VOCs of interest were established in the FS (USEPA 2005a), no delineation of dissolved phase VOC plumes was presented in the RI (USEPA 2004) to inform decisions regarding the sources and impacted area for each VOC. In addition EPA presented no hydraulic analysis of extraction well capture to support the assumed effectiveness of the proposed ground water remedy conceptual design; no quantitative evaluation of natural attenuation processes for VOCs in ground water that potentially can result in a successful cleanup within a reasonable timeframe; and no discussion of the technical basis for the varied cleanup time estimates that EPA presents scattered with no explanation throughout the documents.

These errors and omissions appear to leave EPA with no reliable basis for selecting a soil and ground water remedy for the Site at this time. Given the incompleteness of the site data base, and lack of understanding of key processes (e.g. the concept of a perched zone; little or no data on key geochemical parameters) controlling the fate and transport of contaminants at the Site, it was premature for EPA to reject what are feasible in situ technologies for this site, and select a remedy that is inconsistent with known features of the hydrogeology and contaminant chemistry of the Site.

Additional data collection, followed by a focused phase of treatability testing and pilot studies, should be performed prior to the selection of soil and ground water remedies for the Martin Aaron site. Based on an evaluation of the proposed remedy in light of site conditions (in particular the proposed pump and treat remedy for arsenic in ground water) we conclude that the remedy proposed by EPA in the PRAP (USEPA 2005b) has a high likelihood of failure to meet cleanup standards within the timeframes presented in the PRAP (USEPA 2005b). Conversely, natural attenuation, which EPA rejected, appears to be a viable alternative for reducing VOC concentrations in ground water to standards within a reasonable timeframe.

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Attachment 1
Geology and Water Levels in
Shallow Perched Zone

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September 12, 2005

MEMORANDUM

To: File

From: Maura Metheny

Subject: **Investigation of well logs - Martin Aaron Superfund Site**

An investigation into the lithology and well construction of some shallow wells at the Martin Aaron site was performed so that an interpretation of the Surfical Upper PRM water levels associated with apparently large vertical and horizontal groundwater gradients reported in the RI could be further explained. Monitoring well logs and as-built diagrams presented in the RI Appendices C and F, along with the table of hydraulic conductivities (Table 4-2) were used as were maps generated from well locations supplied by USEPA. The results of this investigation indicate that at least six of the shallow wells are either completed in perched aquifer materials, or are completed so that their water levels are greatly influenced by confining clay and silt materials. Therefore identification of a continuous Surficial Upper PRM Aquifer in the northwest portion of the site and vertical pathways implied by presentation of vertical gradients between some wells may be misleading. Some inconsistencies are also present between the discussion of hydrogeology in the RI and the FS.

Wells MW-12S, MW-13S, MW-14S, MW-15S, MW-16S, MW-17S, MW-18S, and MW-19S are shallow wells, reported to be completed within the Surfical Upper PRM. Chapter 4.0 of the RI explains that the vertical placement of well screens at these locations was intended to intercept the water table aquifer. Figure 1 shows an interpretation of the lithologic descriptions for these well logs with respect to the noted presence of clay or sand, the approximate screened intervals, the approximate depth of the first appearance of wetness noted on the well log, and the September 2002 water level measured in the completed wells. Where lithologic information extends below the total depths of the shallow wells (e.g. MW-15S) on Figure 1, the lithologic information presented is from the nearby boring within same well cluster (e.g. MW-15M).

Lithologic logs and well as-built diagrams show that MW-12S, MW-16S, MW-17S, MW-18S, and MW-19S and are screened in intervals adjacent to thickness of clay and silt material equal to at least half of the well screen length. In each case, the clays and silts occur at the lower portions of the screened intervals. Clay at these shallow depths can have the effect of perching

groundwater in the coarser materials above them, and of partly confining saturated aquifers below them. Therefore, the saturated materials intercepted by these wells may not behave as though they were part of a continuous shallow aquifer unit, but may behave as though they were within clays or perched materials.

There is some evidence to support the conclusion that water levels in these wells are strongly affected by the surrounding clays and silts. First, the hydraulic conductivities calculated for these wells from slug tests reported in Table 4-2 of the RI are small and within the range of hydraulic conductivity typically associated with clay and silt materials, rather than sand materials. Values of hydraulic conductivity reported for MW-12S, MW-16S, MW-17S, MW-18S, and MW-19S are between 0.0279 and 0.864 ft/d. Secondly, dry to moist conditions for some borings adjacent to these wells are reported to occur at depths nearly 10 ft below the water levels measured in the shallower wells. This is condition could be an indication of perching.

Wells MW-14S and MW-15S also appear to be within aquifer materials that are either perched or are not hydraulically connected to surrounding aquifers. Water levels in MW-14S are reported to be 10.78 ft below ground surface in September 2002. This compares to the lithologic log that reports wet conditions are first observed at a depth of approximately 7 ft. In contrast, the well log of nearby well MW-14R reports dry conditions to a depth of 10 ft, underlain by moist sand until the first appearance of wet conditions at a depth of approximately 16 ft. The depth to water in well MW-14R was 15.06 ft in September 2002. It appears that there is an unsaturated interval vertically between these adjacent wells and that MW-14S might be completed in a perched aquifer. MW-15S appears to be screened in 3 ft of sand that is bounded above and below by two clay layers. Hydraulic conductivities reported for this well are small 0.0539 and 0.0749 ft/d and could be representative of the confining clays rather than the sandy materials.

Lithologic logs for wells/well clusters MW-1, MW-4, MW-5, MW-8, MW-9, MW-10, and MW-11 were not found in the materials received for this investigation. Therefore, this investigation cannot report on conditions at these locations.

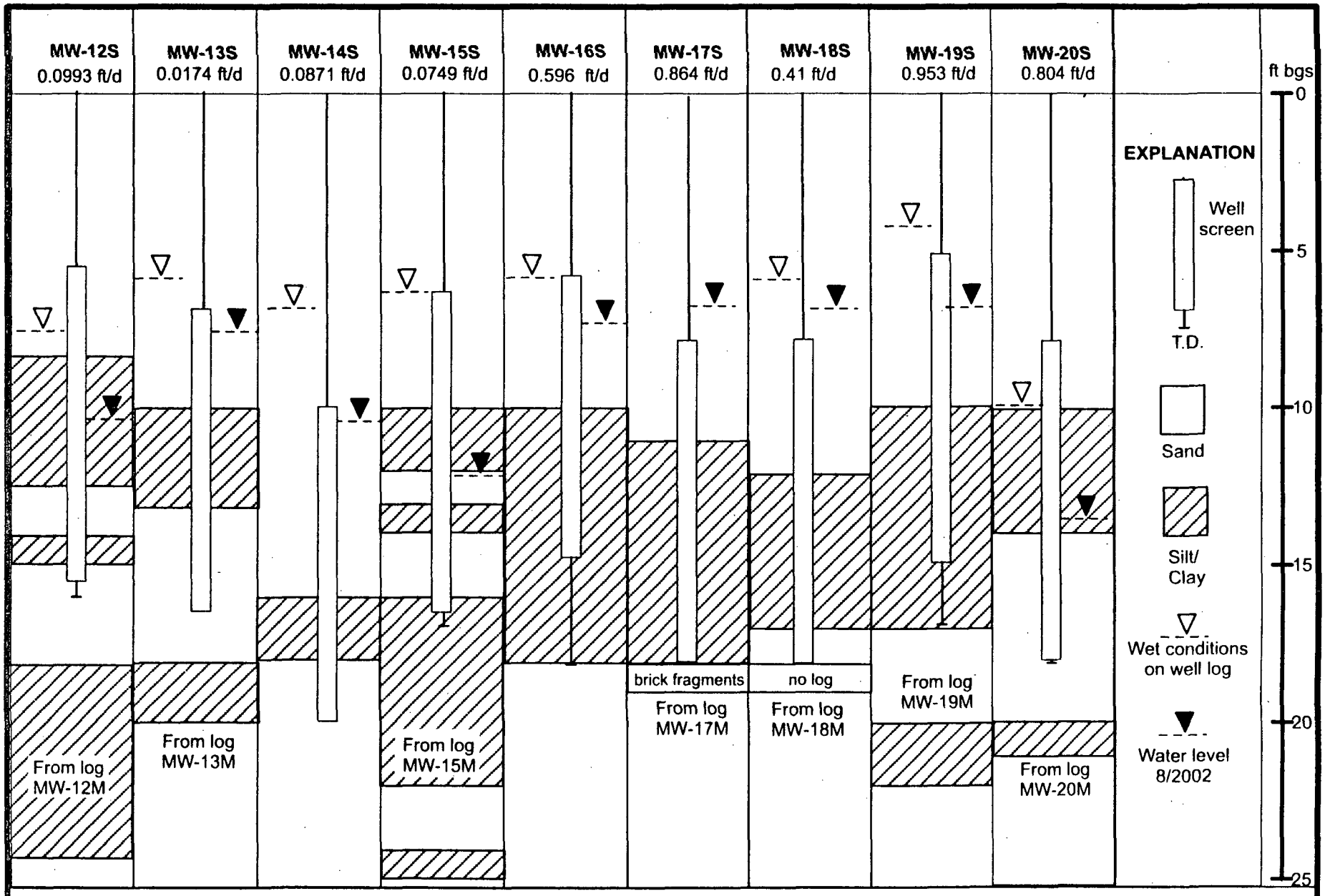
Figure 2 shows locations of wells, reported in the RI to be within the Surficial Upper PRM, which are about 20 ft in depth. Based on this review, wells MW-12S, MW-13S, MW-15S, MW-16S, MW-17S, MW-18S, and MW-19S are noted as perched. Water levels from these wells, with the exception of MW-13S, were used in the depiction of groundwater contours of the Surficial Upper PRM on RI Figure 4-7. The depiction of water level contours in the Surficial Upper PRM Aquifer presented in the RI is therefore not a good representation of the water table. In fact, the water level for well MW-13S, identified herein as being within perched sediments, was ignored in the contouring of RI Figure 4-7. This indicates that the anomalous water levels were partially recognized during the preparation of the RI. However, the exclusion of that water level from the contours is not explained in the text.

It is unreasonable to use contours of Figure 4-7 to determine flow directions and to calculate horizontal flow gradients of the Surfical Upper PRM Aquifer. It appears that the water table does not exist as a continuous free surface and that the saturated zone might begin within confining clay and silt materials locally.

RI figures 5-25 and 5-26 show cross sections through shallow sediments at the site to a depth of 22.5 ft. Lithologic information is shown on the cross section. However, the lithologic information shown adjacent to wells MW-12S, MW-13S, and MW-14S do not correspond with the lithologies reported on the wells logs in Appendix F.

The hydrogeologic description of tidal influence on the water levels in the Surfical Upper PRM Aquifer presented in the FS contradicts the discussion presented in the RI. The RI reports that hydrographs of MW-5S, MW-8S, and MW-20S show minor tidal influence, whereas the FS reports that the Surficial Upper PRM is not tidally influenced. Hydrographs presented in Appendix D of the RI show very small diurnal water level fluctuations for MW-8S, MW-15S, MW-20S, and MW-21S. These hydrographs also show that there are differences in the larger water level trends of these wells. These differences might be further evidence that all of the Surficial Upper PRM wells are not within a single water table aquifer. For example, after 2 days of recording, the water levels in wells MW-20S and MW-21S rise steeply at the same time water levels in wells MW-8S, MW-15S, and MW-19S decline steeply. Longer-term hydrographs from Surficial Upper PRM Aquifer wells and barometric pressure data are not available which makes these short-term trends difficult to interpret.

The hydrogeology conceptual model of the Surficial Upper PRM Aquifer presented in the RI is an oversimplification of the system and is not consistent with the field data. The discontinuity of the perched groundwater and presence of abundant clay material within the upper 20 ft of the site should be a factor in describing the distribution and movement of shallow contaminants. The hydraulic conductivities reported for those perched intervals should not be used in the estimates of aquifer hydraulic conductivities because they are strongly influenced by clay and silt materials. Furthermore, more accurate estimates of vertical gradients should be made assuming that the gradients between some of the pairs of shallow and intermediate monitoring locations represent gradients across a thickness of confining materials and do not represent vertical gradient between well screens within a continuous sand aquifer. There is some doubt that a free surface water table exists everywhere at this site. Recognition that the actual horizontal and vertical flow from shallow, saturated materials containing contaminants are likely impeded by shallow confining materials should be a consideration in the final site remedy. A final site remedy that relies on the lateral and vertical movement of groundwater in the Surficial Upper PRM Aquifer induced by pumping in deeper aquifer materials may not be effective at removing contaminants from the shallow groundwater.



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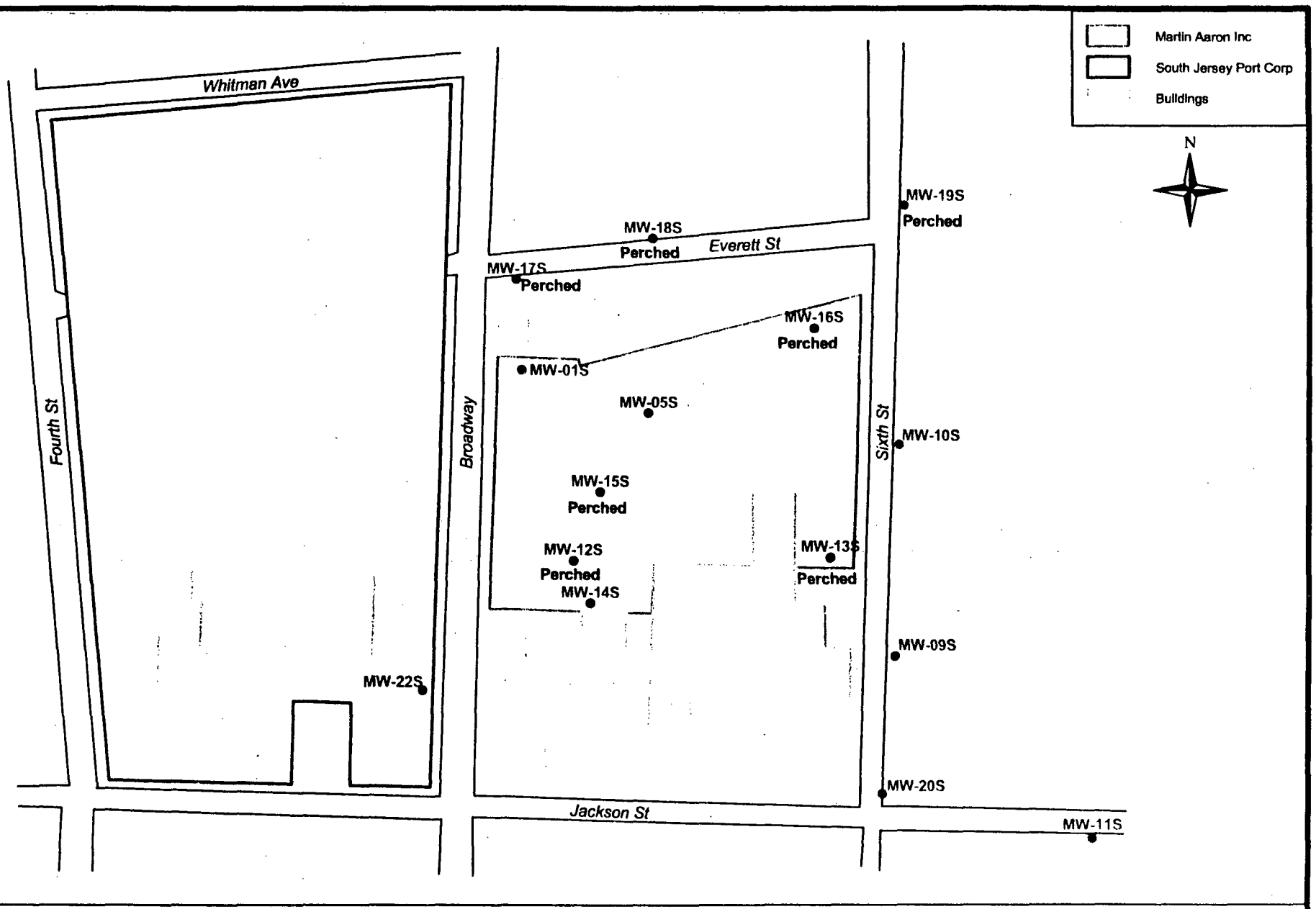
Martin Aaron Shallow Well Logs

Figure 1

500455



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Well Locations of Perched Conditions
in Surficial Upper PRM

Figure 2

500456

Attachment 2
Trend in Vertical Hydraulic Gradients
Between Perched Zone and Upper PRM

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September 12, 2005

MEMORANDUM

To: File

From: Charles McLane

Subject: **Analysis of Horizontal Hydraulic Gradients and the Spatial Distribution of Vertical Hydraulic Gradients Martin Aaron Superfund Site, Camden, New Jersey**

The Remedial Investigation (RI) report (USEPA 2004) for the Martin Aaron site (the Site) describes in Section 4.4.4.1 (page 4-6) a synoptic round of water level data that were collected from monitoring wells installed in the upper zones of the Potomac-Raritan-Magothy (PRM) aquifer beneath the Site in September 2002. McLane Environmental analyzed data from the shallow Surficial Upper PRM and from the Upper PRM, as these upper two zones are designated in the RI.

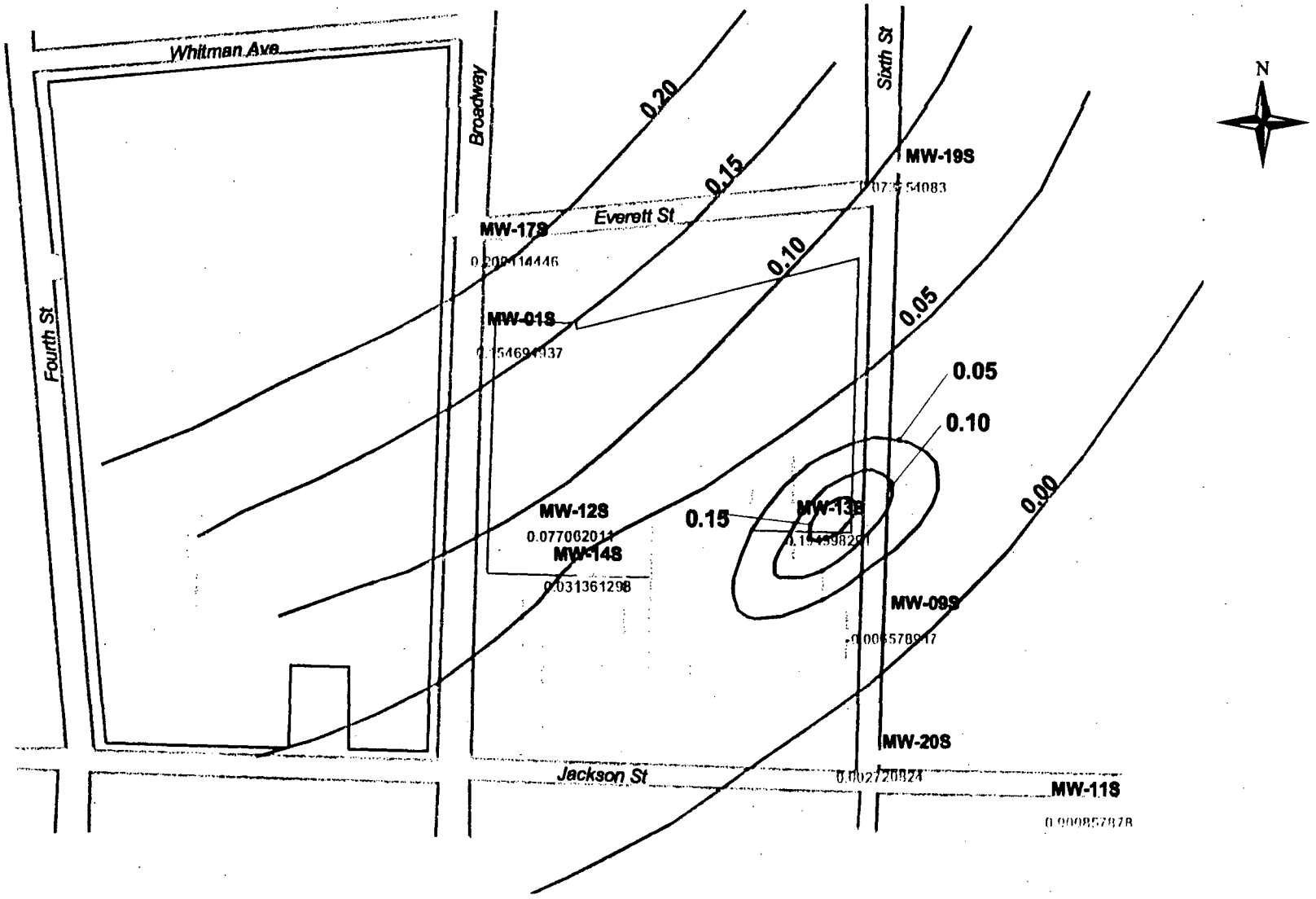
September 2002 water level data were mapped and contoured by EPA in Figure 4-8 of the RI. From those data, a horizontal hydraulic gradient of approximately 0.011 was determined for the Surficial Upper PRM. This gradient appears to be uncharacteristically large for a sandy alluvial aquifer such as the PRM. As confirmation, it was noted that the horizontal hydraulic gradient was approximately a factor of 5 greater than the horizontal gradient determined for the Intermediate Upper PRM in the same September 2002 round of water level measurements. The mapped and contoured water level data for the Intermediate Upper PRM (Fig 4-10) shows a gradient of approximately 0.002.

The steep horizontal gradient in the uppermost zone, coupled with the fact that water levels in the shallow zone over much of the Site are up to 7 feet higher than water levels in the intermediate zone, suggest the presence of a perched shallow system that is either separated from, or in only poor hydraulic communication with the Upper PRM.

To examine this further, the vertical gradient data contained in Table 4.1 of the RI were plotted at the respective monitoring well pair location, and contoured (Figure 1 attached). Mapping of the vertical gradient data for the Site revealed a clear pattern in which the greatest downward vertical head differentials were observed in the northwest portion of the monitoring well network, with lower downward vertical head differentials in the center portion of the network or

wells. In the southeast corner of the monitoring well network, the vertical head differential disappears.

This pattern indicates strongly perched conditions in the northwest portion of the Site, lessening in severity to the southeast. It also demonstrates that the shallow monitoring wells in the central and northwestern portion of the Site should be excluded from any determination of horizontal and vertical hydraulic gradients for the Upper PRM aquifer. In other words, the "vertical gradients" summarized in Table 4-1 of the RI represent head differentials between a perched shallow zone the underlying PRM aquifer, and not vertical hydraulic gradients within the PRM aquifer itself. EPA has confounded the depiction of the flow system by including this mix of perched zone and aquifer water level data in their efforts to depict the hydraulic gradients and to formulate this element of the site conceptual model.



McLANE ENVIRONMENTAL, LLC

Vertical Gradients Surficial Upper PRM to Intermediate PRM
Martin Aaron
(Positive Gradient = Downward)

Figure 1

500460

Attachment 3
Review of Site Geochemical Data

MCLANE ENVIRONMENTAL

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September 12, 2005

MEMORANDUM

To: File

From: Robin Magelky

Subject: **Geochemical Conditions - Martin Aaron Superfund Site**

Attenuation

There are significant attenuation mechanisms present at the Martin Aaron site for both CVOCs and arsenic. While soils contain concentrations of PCE and TCE exceeding 1 mg/kg, PCE and TCE are virtually non-existent in the ground water samples. The CVOCs present are primarily degradation products of PCE and TCE. The breakdown of PCE and TCE into daughter products is consistent with the geochemical conditions present in the Surficial Upper PRM, and indicates that significant attenuation of CVOCs is occurring in the subsurface at the site.

Arsenic attenuation mechanisms also appear to be present, as despite the apparent age of the arsenic in soils at the site, the arsenic contamination in ground water is largely only shallow and localized to the site, as compared to the more recent CVOC releases. Had the arsenic not been attenuated, a zone of arsenic contamination larger in size and with greater dissolved mass would likely have resulted.

Below is a brief discussion of some of the key chemical parameters. Significant to note is the lack of sampling for oxidation-reduction potential (ORP) and arsenic speciation, as these are both important parameters for understanding the geochemical conditions at the site and the fate and transport of arsenic and CVOCs. Also attached are some figures from the RI illustrating the parameters discussed below.

Dissolved oxygen

The results of sampling for dissolved oxygen in the Surficial Upper PRM Aquifer at the site indicate that there is a zone of low dissolved oxygen which is largely coincident with the VOC plume present at the site. This is consistent with the release and subsequent degradation of hydrocarbons, consuming the dissolved oxygen within the plume area. However, in the Intermediate Upper PRM Aquifer, the sampling results indicate a zone of elevated dissolved oxygen potentially emanating from upgradient roughly coincident with the VOC plume. These results do not appear to be consistent with the conceptual site model put forth in the RI.

Alkalinity

The results of sampling for alkalinity in the Surficial Upper PRM Aquifer at the site indicates that there is a zone of elevated alkalinity coincident with the portion of the plume under

the source area. This is consistent with the degradation of organic contaminants, resulting in increased alkalinity. However, in the Intermediate Upper PRM Aquifer, the sampling results indicate a zone of decreased alkalinity potentially emanating from upgradient in roughly the same area where elevated alkalinity was present in the Surficial Upper PRM. These results do not appear to be consistent with the conceptual site model put forth in the RI.

Dissolved iron

The results of sampling for iron in the Surficial and Intermediate Upper PRM Aquifers at the site indicate that there is a zone of elevated iron concentrations roughly coincident with the VOC plume, with the greatest concentrations of iron generally found in the Intermediate Upper PRM. These results are counterintuitive to the dissolved oxygen sampling, as dissolved oxygen concentrations are typically inversely related to the dissolved iron concentrations, i.e. oxidizing conditions typically results in reductions in dissolved iron. These results do not appear to be consistent with the conceptual site model put forth in the RI.

Upgradient impacts

Overall, the data indicates that there may be some upgradient impacts at the site on the geochemistry of the Surficial and Intermediate Upper PRM Aquifers, as many of the geochemical conditions observed at the site within the CVOC plume are also observed in wells upgradient of the source area. In the Surficial Upper PRM Aquifer, this includes elevated iron and arsenic concentrations and low dissolved oxygen in upgradient wells. In the Intermediate Upper PRM Aquifer, the upgradient impacts include VOCs as well as elevated alkalinity and iron.

CVOCs

The distribution of CVOCs at the site, as related to concentrations found in soils, indicates that significant degradation of the CVOCs is occurring at the site. While PCE and TCE are found in soils at concentrations similar to their degradation products, they are largely not present in ground water. As their mobility is roughly equivalent to that of their daughter products, sorption does not explain the lack of PCE and TCE in ground water. The only mechanism which could result in this distribution is reductive dechlorination of PCE and TCE. The food source driving the reductive dechlorination is likely the hydrocarbons also present in the source area at the site. The lack of these food sources to drive the reductive dechlorination in the downgradient portion of the plume may preclude significant degradation of 1,2-DCE in that area, while vinyl chloride may continue to be degraded in the more oxic conditions observed near the downgradient toe of the plume. However, the inconsistency between the dissolved oxygen and iron concentrations in the Intermediate Upper PRM Aquifer make it difficult to draw any conclusions regarding the plume chemistry in this area. In addition, the lack of sampling for other MNA parameters such as ORP makes it difficult to evaluate the potential for continued degradation of the CVOCs at the site.

Arsenic

Arsenic mobility can be impacted by a number of factors, including the redox state of the aquifer, the presence of iron, and the form of the arsenic. The elevated arsenic present in ground water at the site is largely confined to the Surficial Upper PRM Aquifer. The highest concentrations of arsenic are found in the suboxic Surficial Upper PRM, while substantially

lower concentrations are found in the more oxic Intermediate Upper PRM. Another factor in arsenic transport is the presence of iron. The PRM aquifer commonly contains significant levels of iron, which under reducing conditions can increase the dissolved iron content of the ground water substantially. Under oxidizing conditions, the iron will generally be in an insoluble form. on which arsenic will adsorb. Last, the oxidation state of the arsenic (arsenate or arsenite) will also impact its mobility in the ground water. The presence of organic contaminants and anoxic conditions in the Surficial Upper PRM at the site may have resulted in the locally higher dissolved concentrations of arsenic. Without adequate information on the oxidation state of the arsenic, as well as the redox conditions of the aquifer, it is difficult to evaluate what remediation technique would be most applicable. Regardless of which state the arsenic is in or the redox conditions of the aquifer, however, the arsenic will only move at a small fraction of the rate of ground water flow, reducing the ability of pump and treat to be an effective and time efficient remedy.

Other methods for arsenic remediation that may be applicable to this site include chemical fixation through soil mixing (such as treatment with calcium polysulfide or oxidative treatments), oxidation within the aquifer, and permeable reactive barriers with zero valent iron (which would also be effective for the CVOCs). Additional sampling at the site to further characterize the geochemical conditions, along with bench scale or pilot scale tests, should be used to determine the most appropriate arsenic treatment method for this site.

.Proposed Plan Specific Comments

Page 13

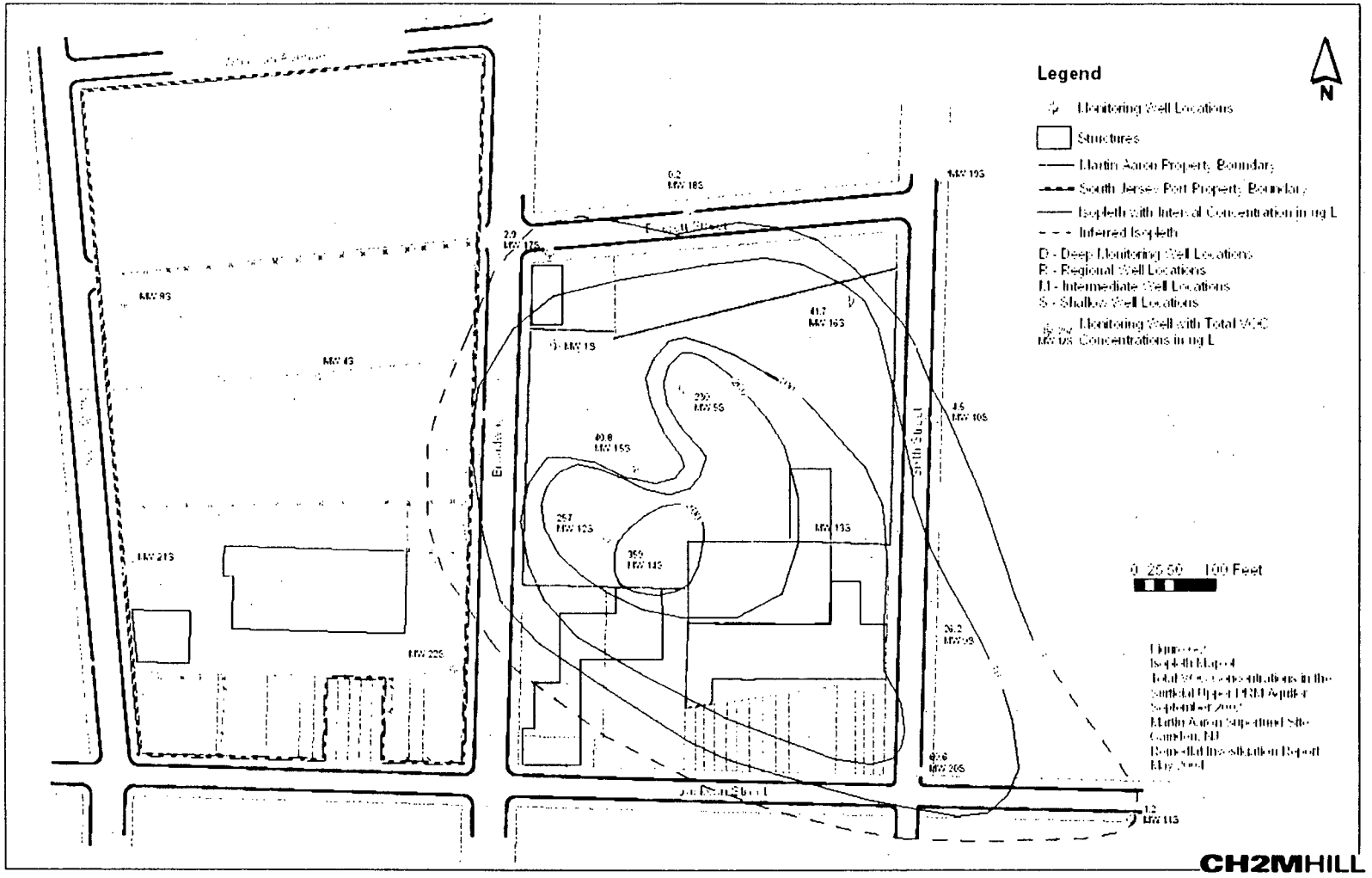
"The prospects for natural mechanisms to decrease the concentration or mobility of arsenic in groundwater are very limited, though a soil remedy addressing arsenic source areas would improve groundwater conditions."

No basis is provided for this statement. If the natural state of the aquifer is to return to oxygenated conditions once the organic contamination is addressed, then there is a potential for the aquifer to naturally attenuate the dissolved arsenic through oxidation and adsorption. This mechanism has clearly been active at the site, given the distribution of arsenic in the subsurface and the low levels of arsenic present downgradient from the source area.

"In addition, the presence of clay and silt lenses within the shallow aquifer will make groundwater restoration difficult, especially for arsenic, since metals tend to sorb onto clay particles making them difficult to remediate."

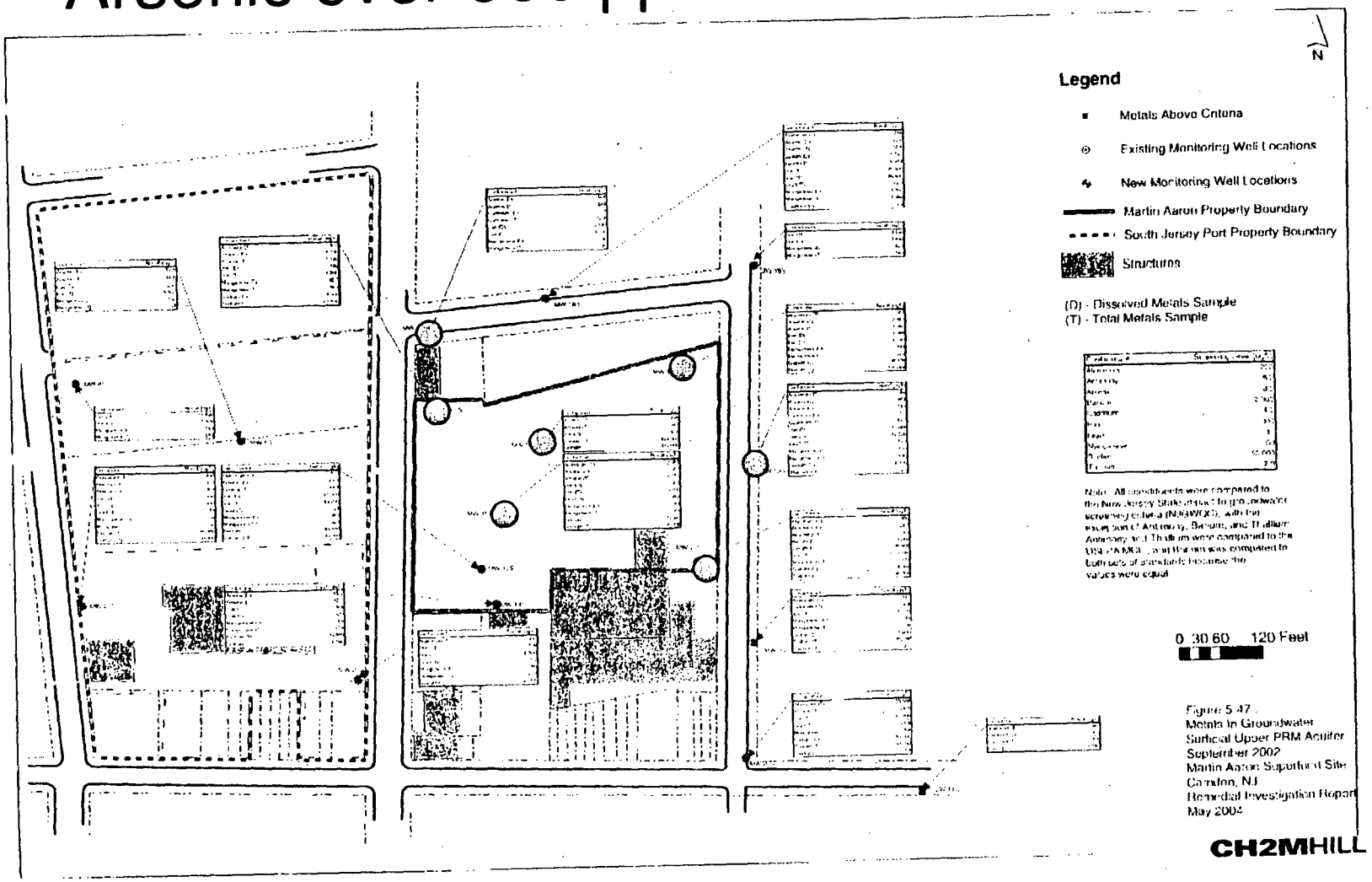
The presence of clay and silt lenses within the shallow aquifer impacts the implementation of all of the evaluated remedies, but would likely have the greatest impact on any pump and treat remedy, as the transport characteristics of arsenic will prolong this type of remedy due to the very high number of pore volumes that would be required to flush the arsenic from the aquifer and these low permeability zones.

Total VOC Plume – 9/02 S.U. PRM

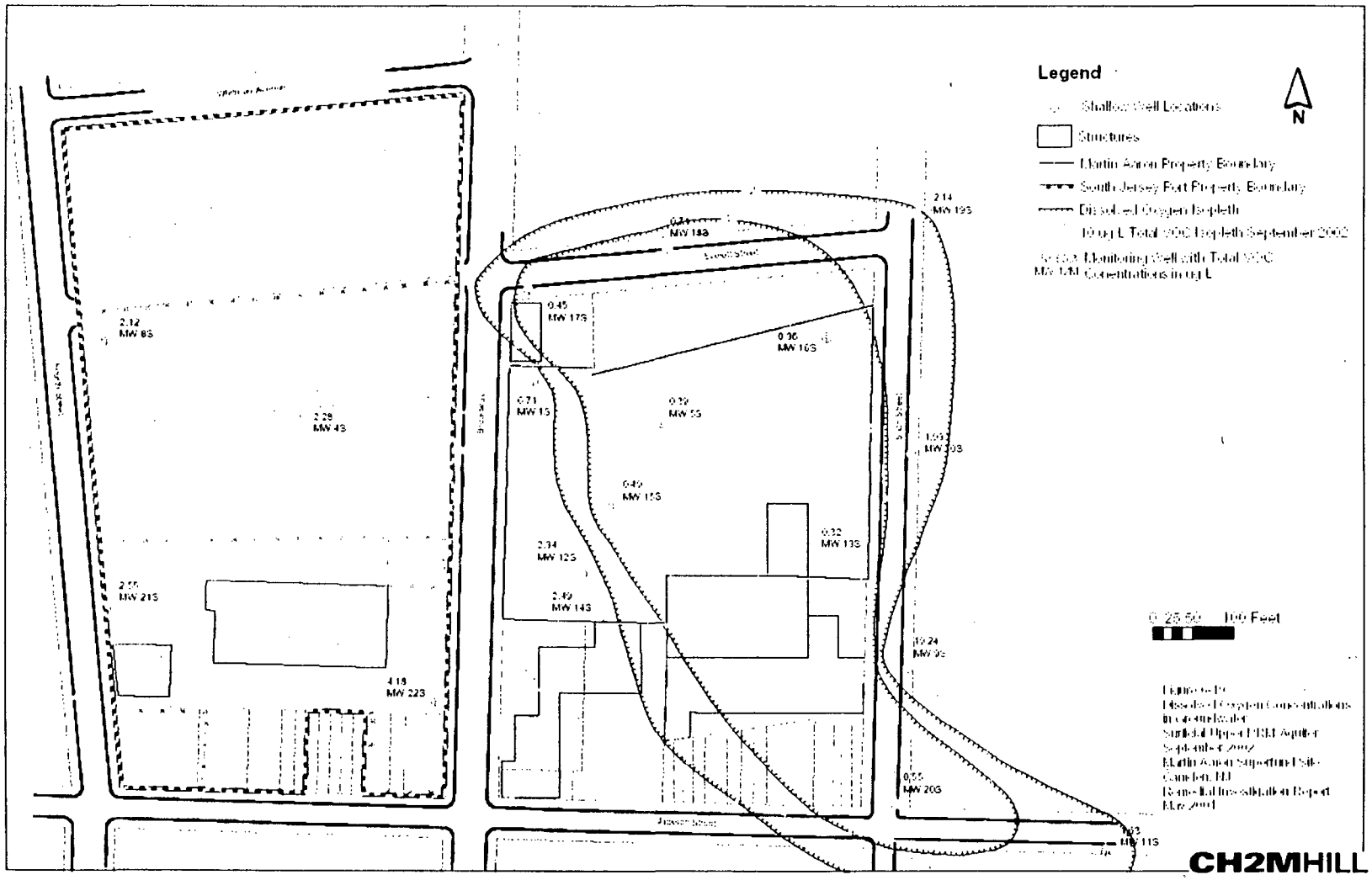


500465

Arsenic over 500 ppb – 9/02 S.U. PRM



Dissolved Oxygen – 9/02 S.U. PRM



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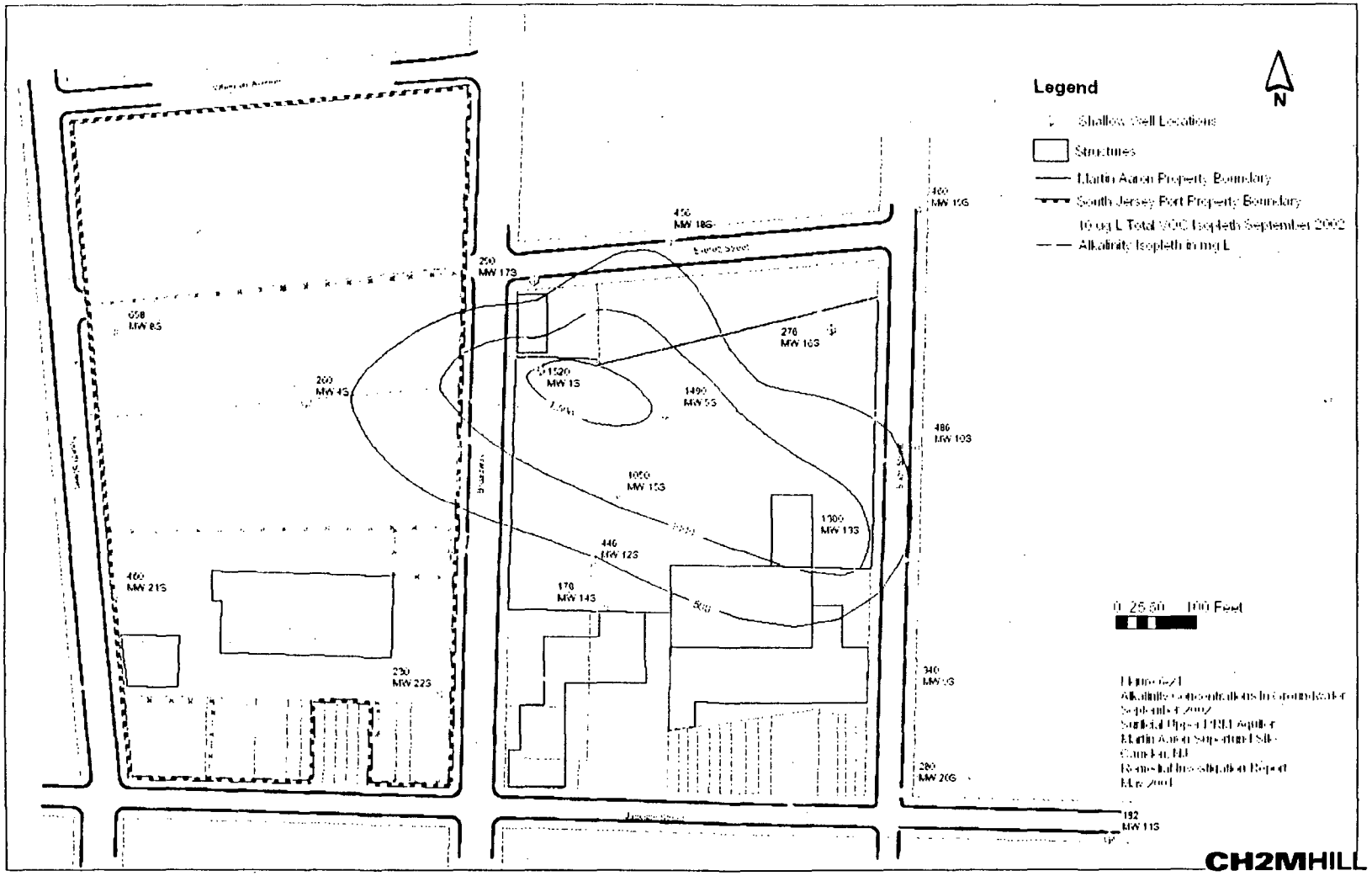
Alkalinity – 9/02 S.U. PRM



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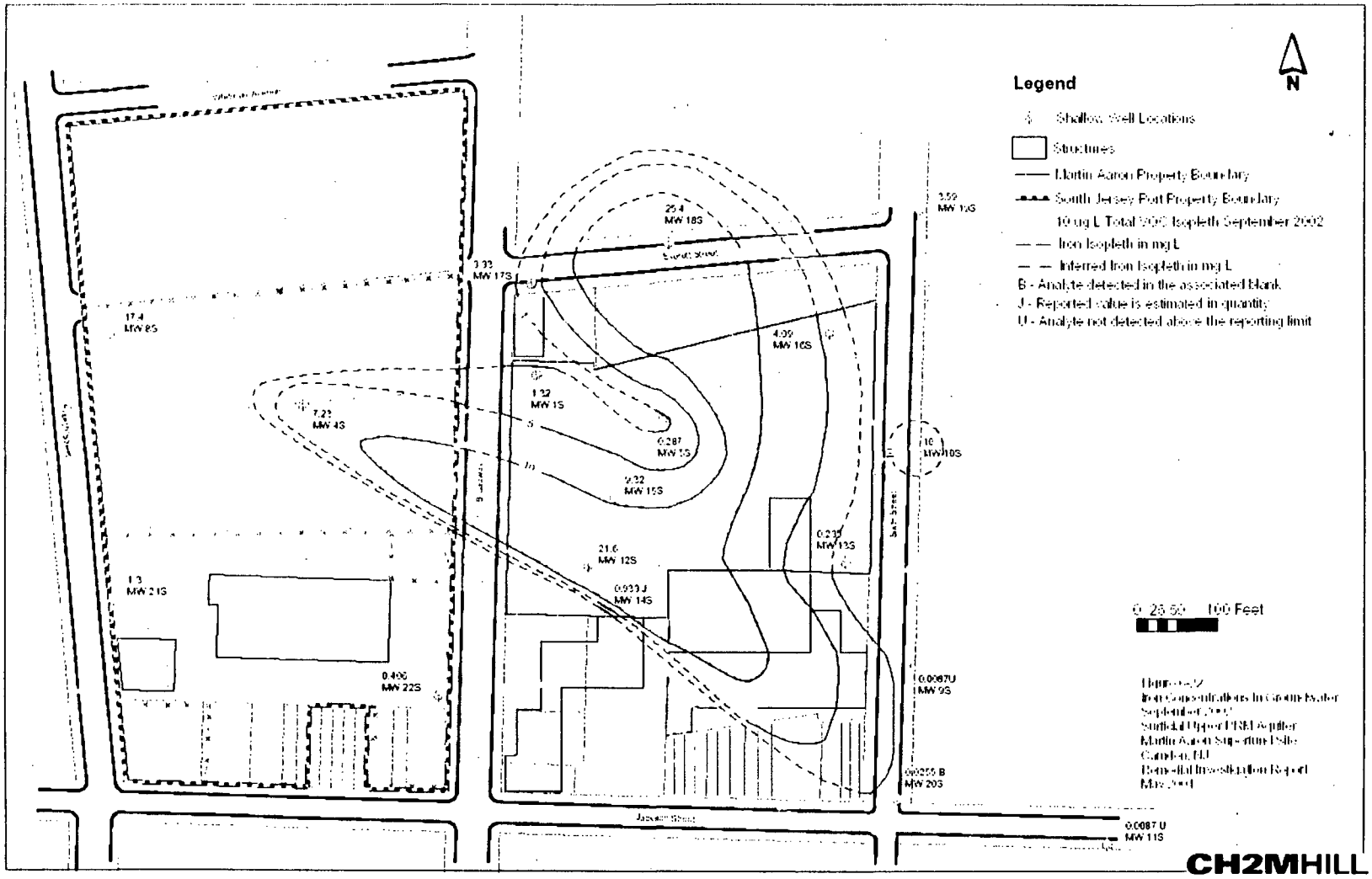
Iron – 9/02 S.U. PRM



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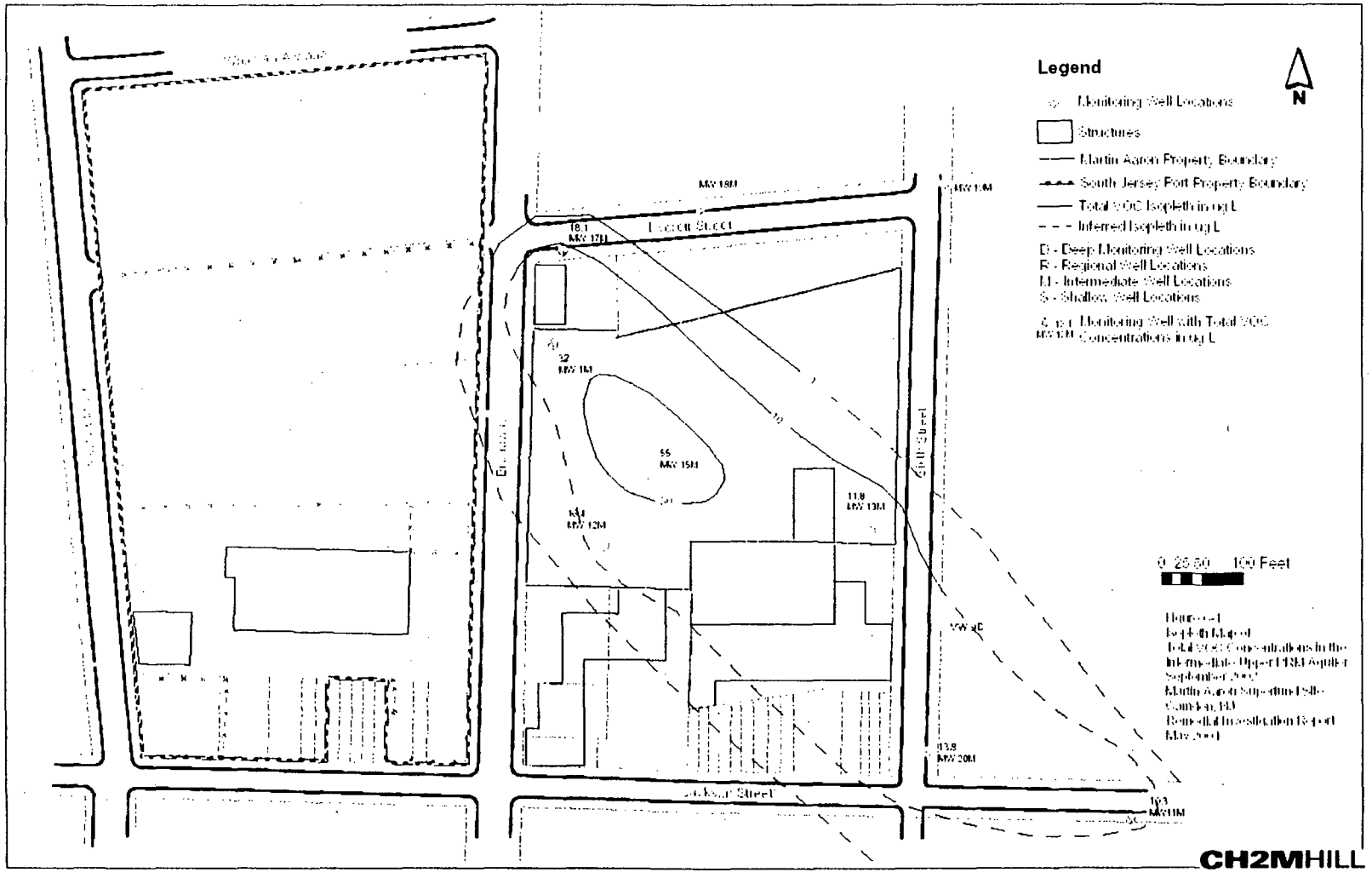
Total VOC Plume – 9/02 I.U. PRM



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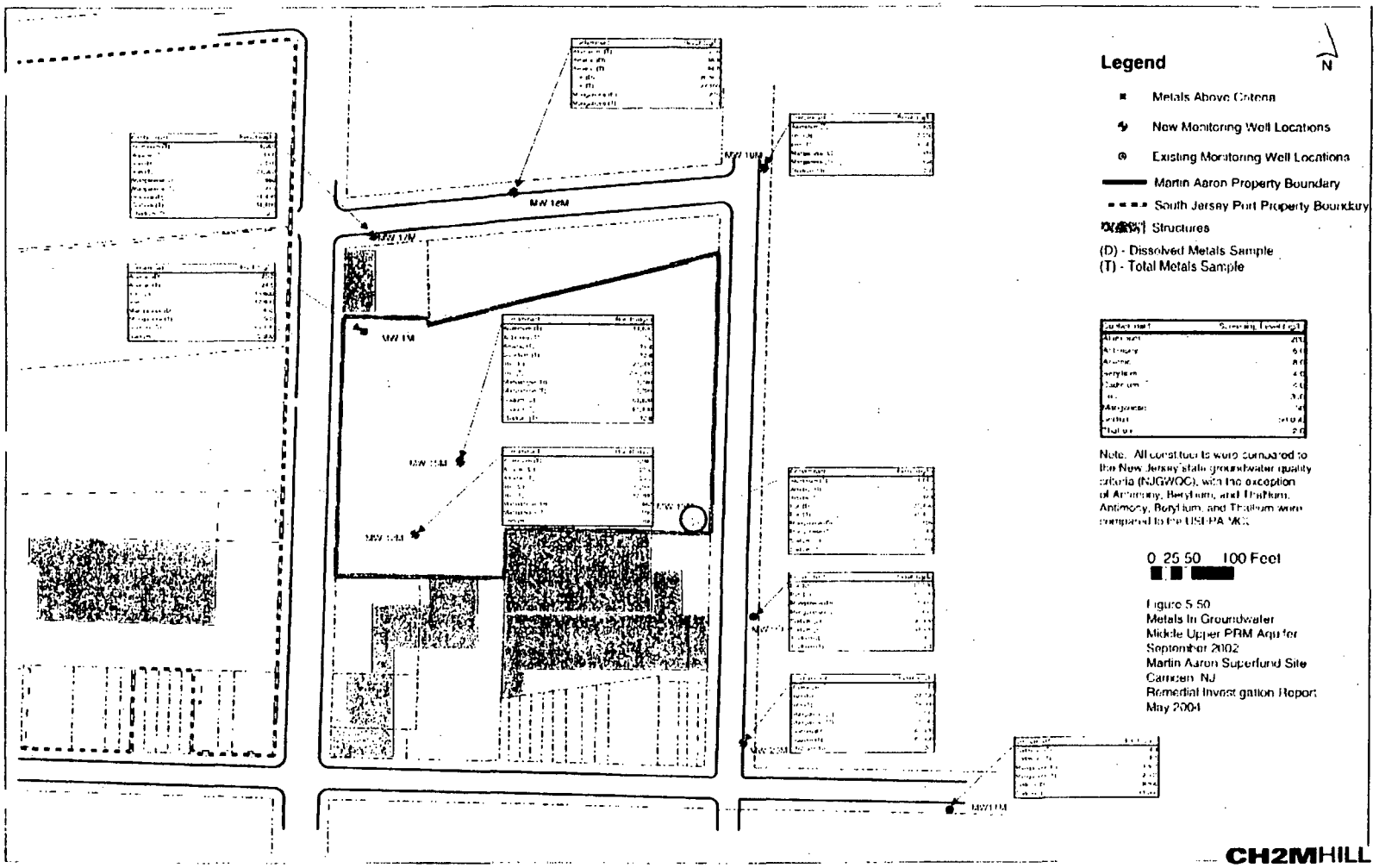
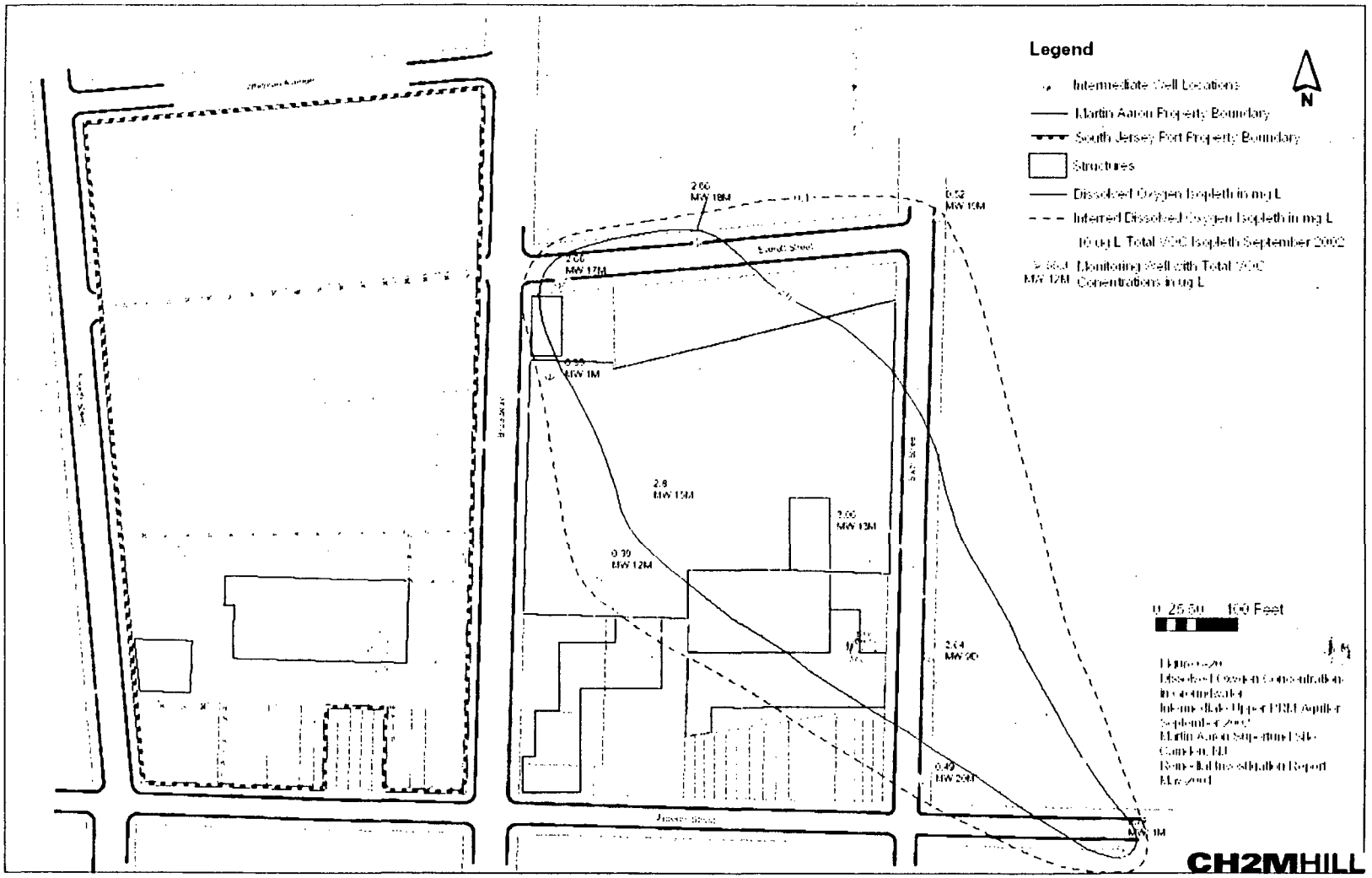
Arsenic over 100 ppb – 9/02 I.U. PRM



500471

Dissolved Oxygen – 9/02 I.U. PRM



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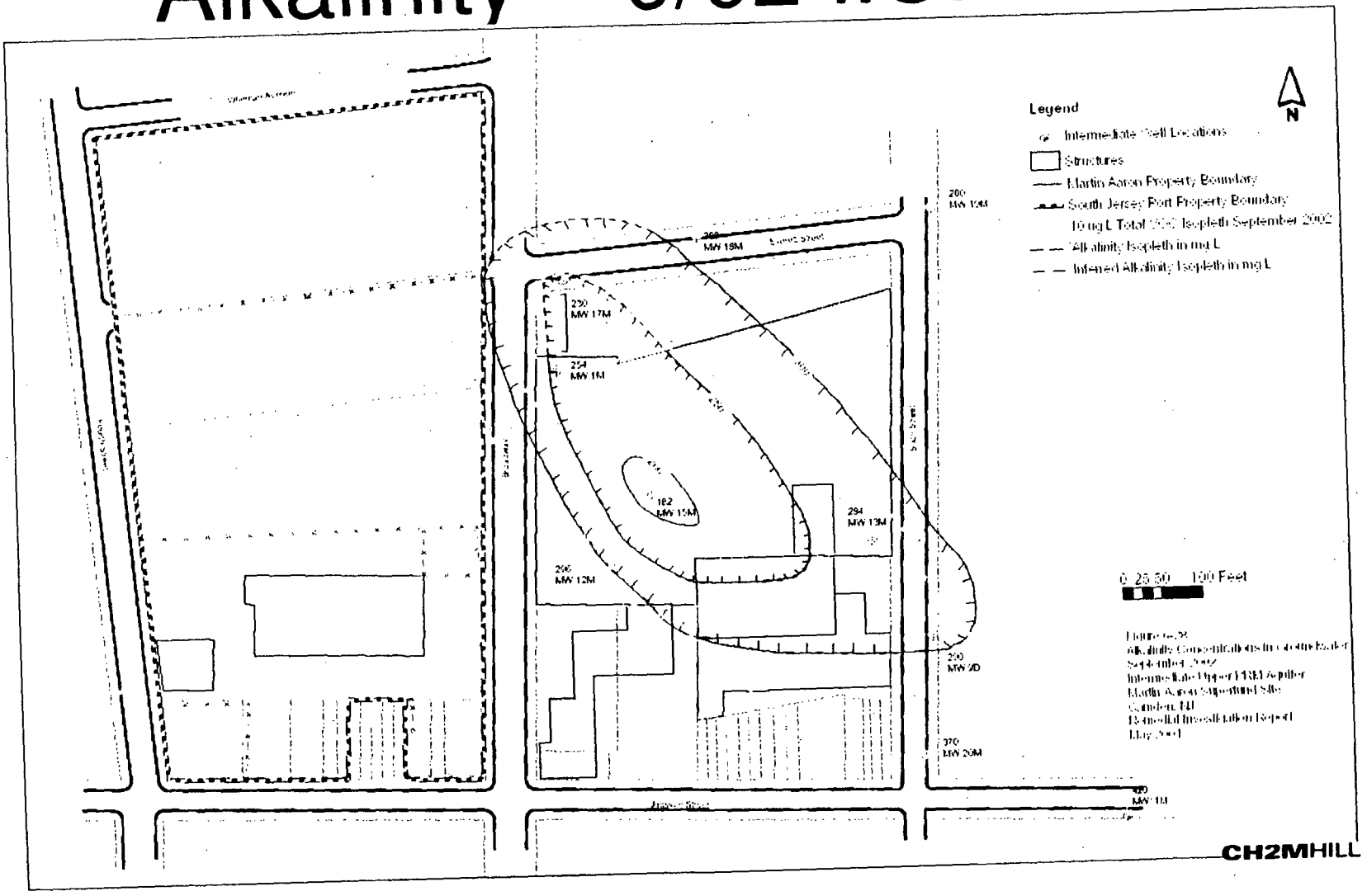
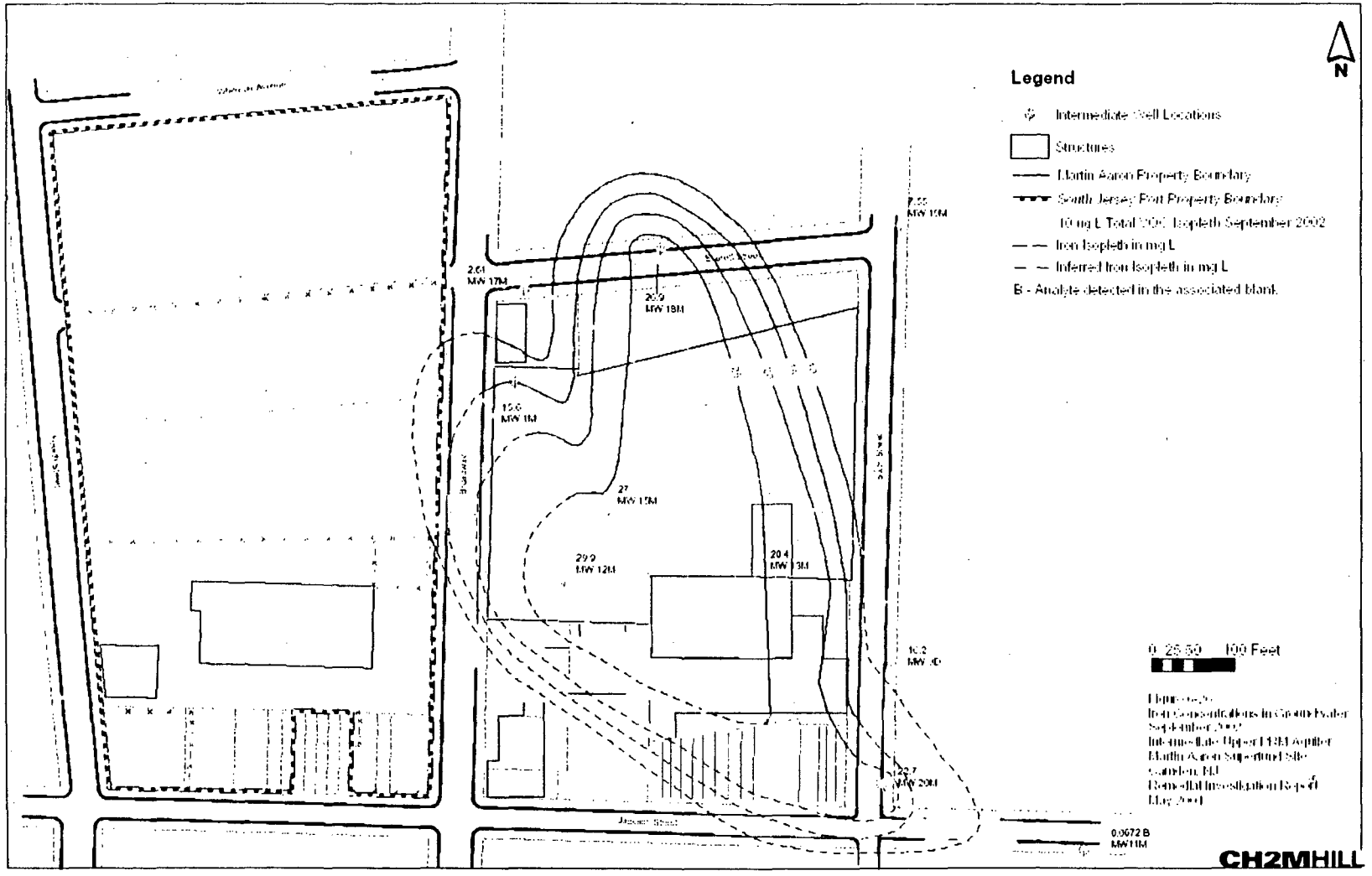
Alkalinity – 9/02 I.U. PRM



500473

Iron – 9/02 I.U. PRM



500474

Attachment 4
Arsenic Pore Flushing Calculation

MCLANE ENVIRONMENTAL

A Limited Liability Company
707 Alexander Road, Suite 206
Princeton, NJ 08540
609.987.1400 Fax 609.987.8488

September 12, 2005

MEMORANDUM

To: File

From: Charles McLane

Subject: **Simple Pore Volume Flushing Model for Ground Water Contaminated with Arsenic Martin Aaron Superfund Site, Camden, New Jersey**

As a check on EPA's estimate of 10 years to remediate ground water for arsenic, a simple dissolved plume volume flushing calculation was performed. The analysis was performed using the method of Zheng (1992) as described by EPA (1994; 1997). The calculations, are based in part on a range of arsenic retardation values that bracket an estimated retardation factor of 90, identified by EPA as a representative value for arsenic (USEPA 1996), and an estimated extraction rate of one plume volume per year from the zone of arsenic-contaminated ground water. To achieve New Jersey state standards for arsenic in ground water, a concentration reduction of approximately two orders of magnitude will be required.

The results indicate that hundreds of years will be required to attain cleanup of arsenic in ground water for the pump and treat system currently proposed for the Site. As EPA points out (e.g., USEPA 1994, 1997), because of the simplifying assumptions used in the flushing analysis (e.g. that ground water is a well-mixed reactor with no slow desorption or other tailing effects during cleanup), this simple calculation likely represents an underestimate of the actual cleanup time.

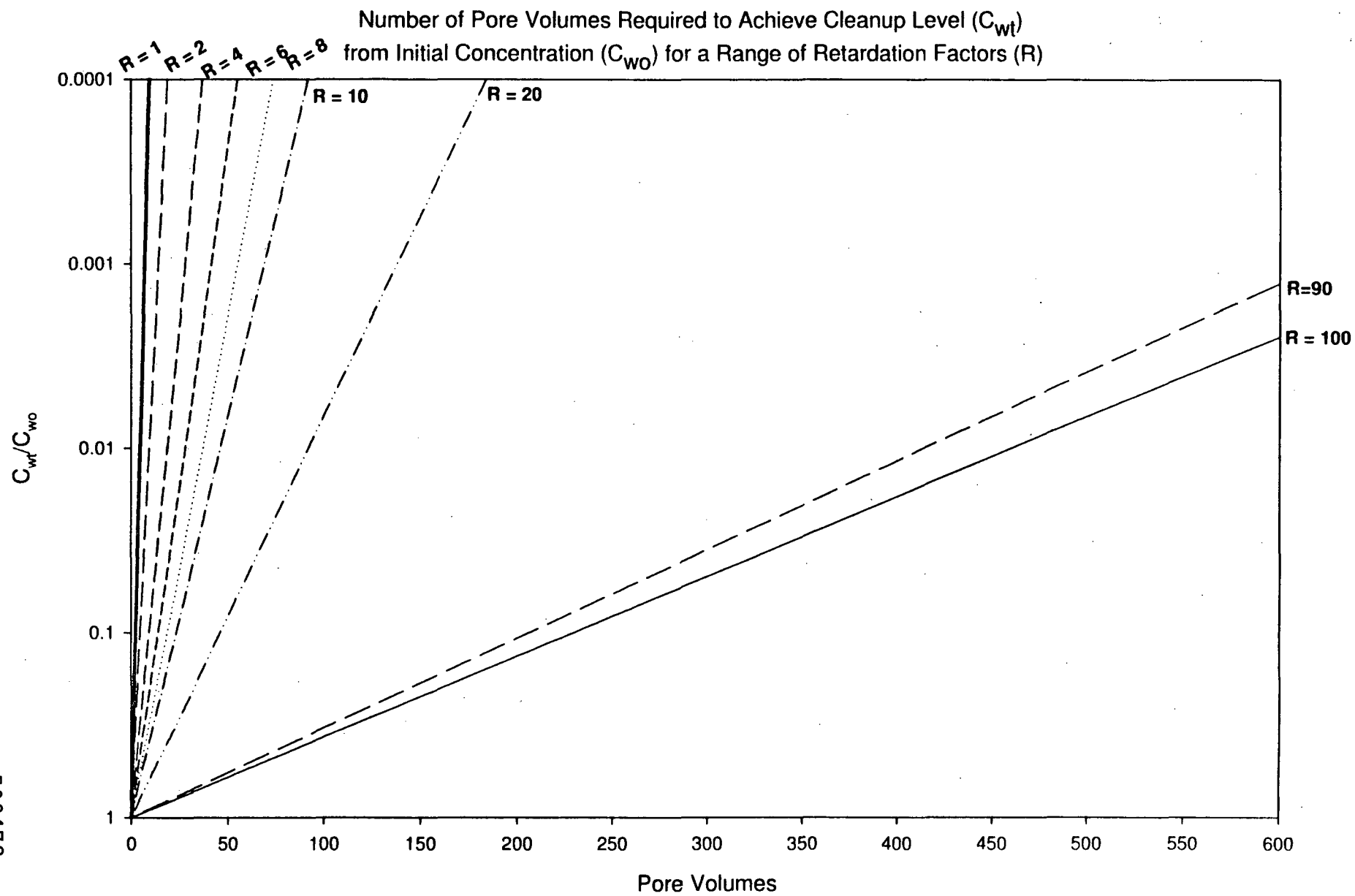
References

USEPA, Cohen, Robert M.; Mercer, James W.; Greenwald, Robert M.; Beljin, Milovan S. 1997. Design Guidelines for Conventional Pump-and-Treat Systems. EPA/540/S-97/504.

USEPA, 1996. Soil Screening Guidance: Technical Background Document, Part 5 Chemical-Specific Parameters. EPA/540/R-95/128.

USEPA, Cohen, Robert M.; Vincent, Alex H.; Mercer, James W.; Faust, Charles R.; Spalding, Charles P. 1994. Methods for Monitoring Pump-and-Treat Performance. EPA/600/R-94/123.

Zheng, C., 1992. MT3D - A Modular Three-Dimensional Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems, S.S. Papadopulos and Associates, Bethesda, MD.


Number of Pore Volumes Required to Achieve Cleanup Level (C_{wt})
from Initial Concentration (C_{wo}) for a Range of Retardation Factors (R)
R = 1
R = 2
R = 4
R = 6
R = 8
R = 10
R = 20
R=90
R = 100
0.0001
0.001
0.01
0.1
1
C_{wt}/C_{wo}
0
50
100
150
200
250
300
350
400
450
500
550
600
Pore Volumes

500478

Attachment 5
VOC Pore Flushing Calculation

MCLANE ENVIRONMENTAL

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707 Alexander Road, Suite 206
Princeton, NJ 08540
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September 12, 2005

MEMORANDUM

To: File

From: Charles McLane

Subject: **Simple Pore Volume Flushing Model for Ground Water Contaminated with VOCs Martin Aaron Superfund Site, Camden, New Jersey**

As a check on EPA's estimate of the timeframe (approximately 40 to 50 years) to remediate ground water for VOCs, a simple dissolved plume volume flushing calculation was performed. The analysis was performed using the method of Zheng (1992) as described by EPA (1994; 1997). The calculations, are based in part on a range of retardation values that bracket representative values of approximately 1.5 to 6 for VOCs of interest (PCE, TCE, DCE and VC), and an estimated extraction rate of one plume volume per year from the zone of VOC-contaminated ground water. To achieve ground water standards for the Site, a concentration reduction of approximately one to two orders of magnitude will be required.

The results indicate that approximately 10 years will be required to attain cleanup of VOCs in ground water for the pump and treat system currently proposed for the Site. As EPA points out (e.g., USEPA 1994, 1997), because of the simplifying assumptions used in the flushing analysis (e.g. that ground water is a well-mixed reactor with no slow desorption or other tailing effects during cleanup), this simple calculation likely represents an underestimate of the actual cleanup time. However, given the low concentrations of VOCS in ground water at the site, the fact that VOCs are sorbed much less strongly than metals such as arsenic, and the fact that Site data provide evidence of natural attenuation processes that are not accounted for in the simple flushing calculation described above, this simple calculation may be taken as a reasonable first approximation of the VOC cleanup time for the Site.

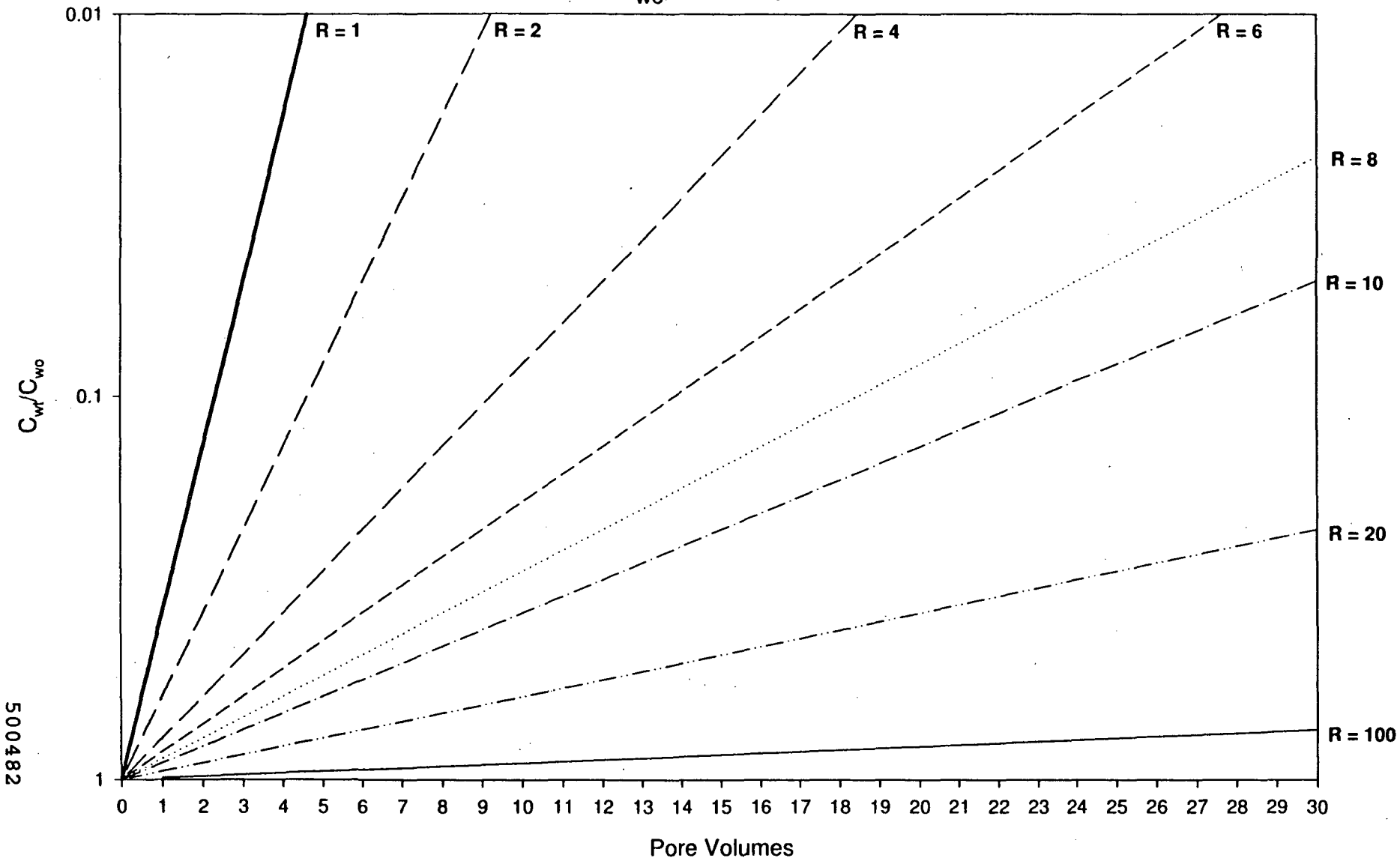
References

USEPA, Cohen, Robert M.; Mercer, James W.; Greenwald, Robert M.; Beljin, Milovan S. 1997. Design Guidelines for Conventional Pump-and-Treat Systems. EPA/540/S-97/504.

USEPA, Cohen, Robert M.; Vincent, Alex H.; Mercer, James W.; Faust, Charles R.; Spalding, Charles P. 1994. Methods for Monitoring Pump-and-Treat Performance. EPA/600/R-94/123.

Zheng, C., 1992. MT3D - A Modular Three-Dimensional Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems, S.S. Papadopulos and Associates, Bethesda, MD

Number of Pore Volumes Required to Achieve Cleanup Level (C_{wt})
from Initial Concentration (C_{wo}) for a Range of Retardation Factors (R)



500482

EXHIBIT B

Discussion of Possible In Situ Remediation Technologies for the Arsenic Contaminated Soils and Groundwater at the Martin Aaron Site in Camden, New Jersey, prepared by Parsons.

Discussion of Possible *In Situ* Remediation Technologies for the Arsenic Contaminated Soils and Groundwater at the Martin Aaron Site in Camden, New Jersey

1.0 INTRODUCTION

This paper has been prepared by Parsons at the request of the Martin Aaron PRP Group to address the potential use of various *in situ* arsenic remediation technologies at the Martin Aaron Superfund Site. The goals of this white paper are to (1) discuss the appropriateness of *in situ* remediation as a viable clean up option for the Martin Aaron site, (2) provide a basic discussion of *in situ* remedation techniques that can be sucessfully applied to the remediation of arsenic in both soil and groundwater, and (3) briefly describe a path forward for evaluating various *in situ* options at the site.

The United States Environmental Protection Agency (EPA) Region 2 recently released a "Proposed Remedial Action Plan" (July 2005) detailing various remedial options for site cleanup.[1] EPA has proposed to use site-wide excavation and pump-and-treat to address all contamination at the site. However, based on available literature and Parsons' experience, the use of *in situ* remediation techniques as a viable option for site cleanup (specifically applied to arsenic) was prematurely discounted by EPA.

Over the past several years *in situ* treatments of contaminants have been widely used to clean up contaminants at remediation sites. According to the EPA, *in situ* technologies make up 42% of all source control treatments at Superfund remedial action sites and nearly three times as much contaminated soil has undergone remediation by *in situ* treatment (40 million cubic yards [cy]) than by *ex situ* treatment (13 million cy). *In situ* remediation of groundwater has been utilized at 132 superfund sites since 1982.[2] Great advances have been made in understanding what processes affect *in situ* contaminant treatment, the longevity of *in situ* treatment technologies, and the acceptance of these technologies by both state and federal agenicies. The EPA recently published a technical report evaluating various *in situ* techniques specifically applied to arsenic remediation.[3] Table 1 provides a list of representative sites where *in situ* methods have been used sucessfully to treat arsenic contamination.

2.0 SITE BACKGROUND

The 2.4-acre Martin Aaron site is located in an industrialized section of Camden, New Jersey. The Remedial Investigation (RI) revealed that contamination at the site consists of volatile organic compounds (VOCs), metals (e.g., arsenic) and a range of other constituents.[4] According to the EPA, arsenic concentrations in subsurface soils at the site tend to be concentrated in the upper 10 feet of soil. Arsenic concentrations in groundwater decrease by an order of magnitude when moving a short distance from

localized hot spots on the property. [4] Parsons believes that the Martin Aaron site is a good candidate for use of *in situ* treatment technologies based on a review of the Feasibility Study (FS) and RI.

3.0 IN SITU REMEDIATION TECHNOLOGIES APPLICABLE TO THE MARTIN AARON SITE

Successful implementation of *in situ* treatment alternatives that use reactive media depends on two primary design considerations. The first design consideration is evaluation and selection of the reactive media that can treat each of the constituents of interest (COI) to achieve applicable design targets (concentrations). The second design consideration is evaluation, selection, and implementation of a method of delivering the reactive media to the subsurface that provides sufficient contact between the COIs and the reactive media in the treatment zone.

Below is a summary of several *in situ* arsenic remediation technologies that should be evaluated for use at the Martin Aaron site (pending the results of further investigation). The relatively shallow nature of the soil contamination combined with a lack of significant human exposure pathways makes the site an ideal candidate for an *in situ* remediation approach. The discussion is divided into technologies that are appropriate for soil and for groundwater. Attention is also given to EPAs evaluation of the use of *in situ* remediation techniques for both soil and groundwater at the site. However, the discussion below only focuses on individual *in situ* treatments that are potential candidates for use at the site and how they can be applied. It does not discuss the many possible combinations of *in situ* techniques that could be used simultaneously or in a "treatment train" to effectively clean up the site.

In Situ Soil Techniques:

Solidification/stabilization (S/S) describes the technique of solidifying a contaminated soil or waste material (through the addition of an additive such as cement) to immobilize the contaminant both chemically and physically, and to reduce leaching potential to groundwater. Often times a chemical such as ferrous sulfate can be added to the cement mixture to enhance the capture of arsenic in the binder matrix. According to EPA, S/S is an established treatment technology often used to treat arsenic in soils and waste.[3] The EPA has identified approximately 77 (58 full-scale and 19 pilot-scale) applications of S/S to treat arsenic. Of the 77 projects, 45 took place at 41 Superfund sites. [3]

In the site FS the EPA uses the phrase "*in situ* stabilization" to refer to both physical and chemical remediation techniques. [5] The processes that govern physical and chemical stabilization are very different and they should be considered separately. *In situ* stabilization can be accomplished through physical binding (i.e., solidification with cement) or by chemical processes (i.e., chemical fixation). The following excerpt taken from the site FS incorrectly generalizes *in situ* solidification/stabilization (S/S) technologies and their limitations:

"In situ stabilization has several limitations. Contaminant depth can limit the effectiveness and some of the application processes. A potential for the stabilized material to weather and release into the environment also exists. Extensive pilot and leachability tests need to be conducted to verify the effectiveness of in situ stabilization. This process is effective with inorganics but not as effective for VOCs and SVOCs. The Martin Aaron Site has a complex mixture of contaminants including inorganics, SVOCs and VOCs. This method would be used primarily for arsenic contaminated soil and therefore, would need to be used in conjunction with other containment or treatment technologies for the remainder of the COCs exceeding PRGs."

Based on a literature review and Parsons experience, many of the technology concerns suggested by the EPA above have been successfully addressed for S/S techniques applied at various remediation sites. The FS discusses the potential use and limitations of S/S at the site using cement specifically. Solidification using cement (with and without additives) has been used successfully to treat both arsenic- and VOC-contaminated soil at depths greater than 10 feet. [6, 7, 8] Solidification/stabilization can be applied to contaminated soils both above and below the water table. Given that the arsenic contaminants in soil are primarily located within the upper 10 feet, contaminant depth should not be a limitation at the Martin Aaron site. Studies performed at other sites showed that after ten years the structural integrity and geochemical nature of the solidified mass continues to exceed the original performance standards established prior to implementation of S/S.[9] The data obtained revealed no evidence that the long-term future integrity of the site would be less stable than current site conditions. Therefore, Parsons does not believe that weathering of the solidified mass would be a limitation to the use of S/S at the Site.

The EPA suggests on page 18 of the PRAP that the uncertainties regarding the implementability of S/S at the site would be high, especially given the heterogeneous nature of the fill material at the site. [1] The heterogeneous nature of the fill material does not hinder the use of a S/S process involving cement. The typical application of S/S via mixing with augers or heavy machinery is not affected by the heterogeneity of the soils. Using these application techniques ensures that the soils are physically mixed and that the cement comes into direct contact with the contaminants of concern (irrespective of the grain size). Based on Parsons experience and a review of the FS and RI, there is no technical justification for EPA to conclude that S/S could not be applied at the Martin Aaron site.

<u>*In Situ* Groundwater Techniques:</u>

When evaluating *in situ* treatment technologies for groundwater the EPA only evaluated one method as described in the following two excerpts from the FS:

"In this response action, metals in groundwater are treated in situ by the addition of organic sulfur compounds, which stabilize the metals. The sulfur compounds react with

the dissolved metals to form a complex which sorbs to the soil particles and immobilizes them. This technology is effective for metals in groundwater, but is not effective for VOCs or SVOCs seen in groundwater. Additional treatment would be required for this technology to be effective to treat all COCs seen in groundwater at the Martin Aaron Site."

"Compounds such as calcium polysulfide solutions decompose in water, reacting with carbon dioxide and oxygen to produce calcium thiosulfate and hydrogen sulfide. Metals are precipitated out of water as metal sulfides by the reaction with the calcium thiosulfate and H2S."

The solubility of inorganic compounds is governed by acidity, measured by pH, and oxidation-reduction potential (ORP, or Eh) of water. Therefore, treatment amendments are evaluated on their ability to move and maintain the pH and/or Eh of the treatment zone in a range that is favorable for immobilization of all inorganic constituents. The *in situ* treatment method described by EPA above would only work under reducing conditions. Insufficient data was collected during the RI to accurately characterize the geochemical environment of the subsurface soils and surficial aquifer at the site. The aerobic/anaerobic nature of the surficial aquifer has not been clearly defined. *In situ* treatment of arsenic can take place in both oxidizing and reducing conditions; however, the mechanisms used to treat arsenic under these conditions are very different. It is therefore unadvisable to discount all *in situ* treatment methods when the geochemical nature of the subsurface environment has not been fully defined. Finally, the EPA did not consider other chemical reagents successfully used to treat both inorganic and organic contaminants such as ferric chloride, hydrogen peroxide, potassium permanganate, and zero valent iron. [10, 11, 12]

Furthermore, EPA's claim that different technologies would be required to treat the VOCs and SVOCs in the groundwater is not cause to rule out *in situ* arsenic treatment because for the most part, the contaminants are not colocated.

On page 18 of the PRAP the EPA suggests that the "uncertainties" involved with the implementation of alternative G4 (geochemical fixation) are high relative to the implementation of all other groundwater techniques. [1] However, EPA has classified common *in situ* treatment design parameters, such as chemical dosage rate and chemical mix type (developed during treatability studies to effectively design and deliver the treatment technology), as uncertainties. In recent years great advances have been made in methodologies for determining the appropriate *in situ* technologies (including appropriate chemical mixes) for contaminants such as arsenic at specific sites. Parsons believes that design parameters developed during *in situ* treatability studies are no more uncertain than data collected during pumping tests used to design pump-and-treat systems. They are simply parameters that must be established prior to proper implementation of the technology. Below is a summary of two *in situ* techniques that could potentially be used at the Martin Aaron site to treat groundwater. The techniques also have applications for treating soils.

In Situ Chemical Fixation

In Situ Chemical Fixation (ISCF) is an innovative *in situ* arsenic remediation technology. Variations of ISCF processes have also been applied to heavy metals in cationic form (e.g., Cd^{2+}, Cr^{3+}, Pb^{2+}) in both soil and groundwater applications. ISCF works by chemically fixing the contaminant with the use of a binding agent and, depending on the characteristics of the medium and newly formed phase, reduces the toxicity and/or water solubility of the contaminant. In ISCF, a liquid reagent (e.g., ferric chloride, ferrous sulfate) is applied to contaminated soil or aquifer media in place. Research shows that arsenic compounds formed with ferric (Fe^{3+}) ferrous (Fe^{2+}) iron and calcium (Ca^{2+}) salts tend to be highly insoluble and relatively stable.

Parsons has in-depth knowledge of the successful implementation of full-scale ISCF at two arsenic-contaminated substation sites in the panhandle of Florida. ISCF arsenic treatments have also been successfully applied at the Silver Bow Creek Superfund site in Montana and the Wisconsin DNR Orchard Soil Project. [3] Results from soils treated using ISCF show a dramatic decrease in leachable arsenic (both TCLP and SPLP) as compared to untreated soils; specifically, total leachable arsenic was reduced by a factor of 200 to 1000 in the studies. [13, 14, 15] The subsurface conditions (e.g., grain size, depth of arsenic contamination, size of arsenic plume, and presence of organic peat layers) at the Martin Aaron site are very similar to the successful full-scale ISCF demonstration sites in Florida. [13, 14, 15] In reviewing the RI, FS and PRAP, Parsons could see no justification to conclude that ISCF could not be effectively applied at the Martin Aaron site to treat arsenic in both soils and groundwater.

In Situ Oxidation/Redox Manipulation

In situ redox manipulation (ISRM) involves injection of a chemical reducing/oxidizing agent in the contaminant plume. The agent alters the chemical redox potential of aquifer fluids and sediments. Redox-sensitive metals in the source area or migrating through a down-gradient treatment zone are immobilized. The oxidizing agents most commonly used for treatment of hazardous contaminants in soil are ozone, hydrogen peroxide, hypochlorites, chlorine, chlorine dioxide, potassium permanganate, and Fenton's reagent (hydrogen peroxide and iron). The reducing agents most commonly used are dithionite, gaseous hydrogen sulfide, and zero-valent colloidal iron. [12] Some of the advantages of *in situ* oxidation treatment of contaminants are that it is fast, aggressive, and indifferent to many contaminant characteristics and concentrations.

In situ oxidation has been successfully used to treat arsenic-contaminated groundwater at various facilities (Table 1). [16, 17] The Atofina Chemicals Inc. Superfund Site, in Tacoma, Washington, used hydrogen peroxide followed by a ferric chloride solution to stabilize arsenic in groundwater. [18] Data from the site shows that arsenic concentrations were reduced by 61 to 99.9% after 3 months, a 92 to 99.9% reduction after 6 months, and

reductions as high as 99% after 16 months. After nine months, more than 70% of the wells on site had 85 to 99.9% reductions in dissolved arsenic concentrations.

Parsons believes that *in situ* oxidation/reduction could be applied at the Martin Aaron site to both soils and groundwater though a series of direct push injection points. EPA did not directly consider this technology in their feasibility study.

4.0 SUMMARY AND PATH FORWARD

In situ treatment alternatives can be applied as targeted source remediation measures, site wide remediation measures, or as treatment barriers. When compared to *ex situ* techniques, *in situ* treatment of contaminants pose less of a health risk because there is no need to remove, transport, and dispose of the contaminants. *In situ* technologies typically offer a more rapid and complete destruction of the contaminant when compared to conventional pump-and-treat technologies. [12]

The EPA has assumed that *ex situ* methods for contaminant treatment at the site will be more effective than *in situ* treatments without performing the appropriate and necessary treatability or pilot studies to support this assumption. Likewise the EPA has classified common *in situ* treatment design parameters (developed during treatability studies) as uncertainties (e.g., chemical dosage rate, chemical mix type).

The published arsenic literature indicates that many variables may influence arsenic mobility in soil and aquifer media. Significant parameters include pH, oxidation/reduction potential (ORP), carbon content, iron and other metal oxides/hydroxides, anion and cation exchange capacity, arsenic concentration, and grain-size distribution (particularly fines). [19] Additional site characterization should be conducted and treatability studies should be performed to evaluate potential *in situ* remediation techniques that could be successfully applied to the site. Discussed below are basic steps which could be taken to finalize site characterization and establish a path forward for conducting treatability studies:

1. Additional soil and groundwater data should be collected in the vicinity of arsenic contamination. The following analyses should be conducted; arsenic speciation, iron speciation, ORP evaluation, grain size analysis, and major anion/cation analysis in groundwater.
2. Site-specific arsenic distribution coefficients (K_d) should be calculated for subsurface soils. The K_d values can be used for creating more accurate fate and transport models for the site. This would provide a means for more accurately estimating the mobility of arsenic in the subsurface and the time required to meet cleanup goals using various *in situ* techniques. [19]
3. Leaching tests (e.g., SPLP and/or TCLP) should be conducted on contaminated soils from various areas to confirm the contributions of contaminants to groundwater (in other words, to confirm the location of true arsenic hot spots).

4. The above data should be evaluated in conjunction with existing site information and a literature review to determine one or two *in situ* remediation techniques worth evaluating in treatability studies.
5. Both subsurface soil and groundwater should be collected for treatability testing (can be collected during step one). The following two phases of treatability studies should be conducted; (1) batch experiments to determine the conditions necessary to optimize *in situ* treatment (ISCF) of arsenic and possibly other contaminants found on site, and (2) bench-scale column tests to demonstrate the feasibility of a field-scale application of an *in situ* treatment technology. Batch testing will provide a quick indication as to whether or not a particular technique is appropriate for the site. It will also provide initial performance parameters that can be used in dynamic flow column testing. Column testing should be performed on contaminated soils from the site utilizing groundwater to simulate *in situ* site conditions.
6. Finally, the results of batch and column testing should be used to design a pilot-scale field application at the site.

TABLE 1
IN SITU REMEDIATION TECHNOLOGIES & CASE EXAMPLES

In Situ Technique	Media		Contaminant		Site Name	State	EPA Region	Reference
	Soil	Groundwater	Arsenic	VOC				
Solidification/Stabilization	X		X		Energized Substation in Florida	FL	Region 4	6
Solidification/Stabilization	X			X	Columbus MGP	GA	Region 4	7
Solidification/Stabilization	X		X		Outboard Marine CO.	IL	Region 5	8
Solidification/Stabilization	X		X		Anaconda Smelter	MT	Region 8	3
Solidification/Stabilization	X		X		Jacksonville Naval Smelter	FL	Region 4	3
Solidification/Stabilization	X		X		Fernald Env. Management Site	OH	Region 5	3
Solidification/Stabilization	X		X		Imperial Oil Company-Champion Chemical	NJ	Region 2	3
Solidification/Stabilization	X		X		Portable Equipment Salvage Company	OR	Region 10	3
Solidification/Stabilization	X		X		Maggillis & Gibbs/Bell Lumber & Pole	MN	Region 5	3
Solidification/Stabilization	X		X		Palmeto Wood Preserving Site	SC	Region 4	3
Solidification/Stabilization	X		X		Spring Hill Mine	MT	Region 8	3
Soil Flushing/Washing	X	X	X		Energized Substations in Florida	FL	Region 4	10,13,14
In Situ Chemical Fixation	X	X	X		Energized Substation in Florida	FL	Region 4	10,13,14
In Situ Chemical Fixation	X		X		Silver Bow Creek/Butte Area	MT	Region 8	3
In Situ Chemical Fixation	X		X		Wisconsin DNR Orchard Soils	WI	Region 5	3
Electrokinetic Remediation	X	X	X		Energized Substation in Florida	FL	Region 4	16
In Situ Oxidation/Redox Manipulation		X	X		Peterson/Puritan, Inc. Superfund Site,	RI	Region 1	18
In Situ Oxidation/Redox Manipulation		X			ATOFINA Chemicals Inc. Superfund Site	WA	Region 10	19

Note: This table list only a small number of sites (for illustration purposes) where in situ remediation technologies have be utilized to clean up arsenic and VOC contamination. Additional case studies may be found in references 2 and 3 and at www.epareachit.org, www.clu-in.org, and www.epa.gov.

5.0 REFERENCES

1. U.S. EPA., *Proposed Remedial Action Plan Martin Aaron Site*, July 2005
2. U.S. EPA., *Treatment Technologies for Site Cleanup: Annual Status Report (Eleventh Edition)*. Office of Solid Waste and Emergency Response. EPA-542-R-03-009. February 2004.
3. U.S. EPA., *Arsenic Treatment Technologies for Soil, Waste, and Water*. Office of Solid Waste and Emergency Response. EPA-542-R-02-004. September 2002.
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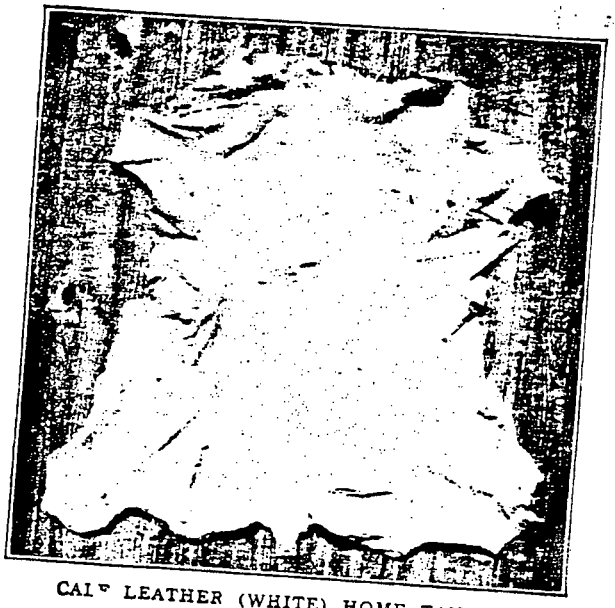
EXHIBIT C

Excerpts from Home Tanning and Leather Making Guide, Albert B. Farnham (circa 1900).

675.2



CALF LEATHER (WHITE) HOME TANNED

HOME TANNING AND LEATHER MAKING GUIDE

A BOOK OF INFORMATION FOR THOSE WHO WISH TO TAN AND MAKE LEATHER FROM CATTLE, HORSE, CALF, SHEEP, GOAT, DEER AND OTHER HIDES AND SKINS; ALSO EXPLAINS HOW TO SKIN, HANDLE, CLASSIFY AND MARKET.

PROPERTY OF ALLENTOWN PUBLIC LIBRARY

By
ALBERT B. FARNHAM
Tanner and Taxidermist

PUBLISHED BY
A. R. HARDING
COLUMBUS, OHIO

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cellar or some such place, through the fall, winter and spring months without any other preparation.

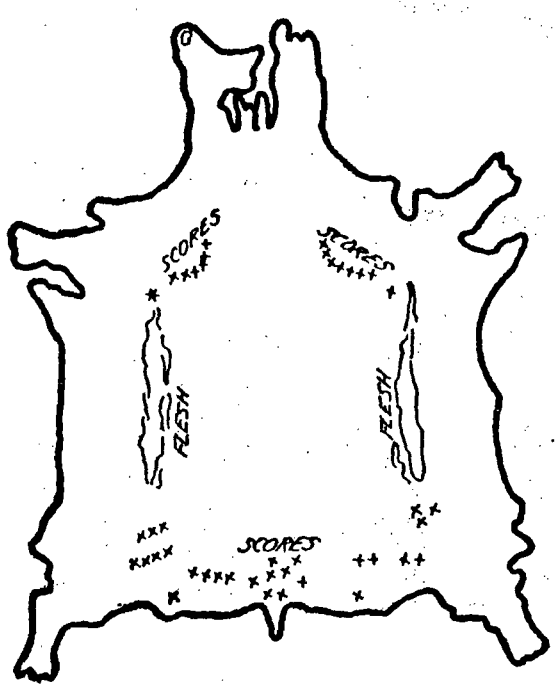
This gives opportunity to select skins for tanning and to sell whenever prices are favorable. Such hides can not be safely kept after May or June unless poisoned with an arsenical solution. This solution is made as follows:

Powdered Arsenic .....10 lbs.
Concentrated Lye.....4 oz.
Water.....8 gals.

or smaller quantities in proportion. Mix the arsenic and lye with the water in a tub or jar and let it stand several days, five or six, say. Mix one part of this solution with five parts water and apply to both sides of the hides with a brush or better, a sprayer. I hardly need add the caution that this solution be kept away from stock or children, as it is, of course, very poisonous. Unless treated in some such manner, hides will be riddled with holes or entirely eaten up by the dermestes or bacon beetle during the summer months.

Any cut 6 inches from edge of hide reduces it in value one grade, as will also five scores or

one score where the nail can be pushed through. Places rubbed by dragging reduce one grade. Brands and grub holes are also reckoned as damages, as they mar the leather for many uses,



A POORLY TAKEN OFF HIDE, SCORED AND FLESH LEFT ON

Scores (cuts) are very numerous around the tail and hind quarters, which is the most valuable section of the hide. Careful knife work will prevent these defects.

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which they are piled or packed as previously described. When transferring the hides and skins from the bank to the pile, it will be necessary to sprinkle a little more salt over each one as it is laid on the pile. A careful watch should be kept for unsalted spots or sections not well supplied with salt, and if any are found they should be completely covered with salt.

While the salting of calfskins and yearlings is practically the same as for cattle hides, some recommend the use of medium-fine salt for the first two. This is a good plan to follow, although the use of finer salt is not necessary. Horsehides may be salted in exactly the same way as cattle hides.

Sheepskins, however, require the use of fine salt. They must also be allowed a little more time to cool off, and should not be kept more than five or six days after salting, since they have a tendency to heat very quickly and easily. For the same reason it is advisable not to put more than 10 in one pile.

Protecting Stored Hides Against worms and Bugs. Cured hides and skins are often attacked

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by insects and worms during storage and transportation. This is especially true in the case of dried hides and skins not cured with salt and of those in tropical or semi-tropical countries. Various preparations, the so-called "hide poisons," are applied as a protection against insects and worms. Many of these preparations are covered by patents which contain complete instructions as to the methods of application.

As a rule, the poison is applied by sprinkling the solution over the hair where the insects are found. A light application on the flesh side will do no harm. Arsenious acid in alkaline solution, potassium cyanide, carbolic-acid creosote, naphthols, naphthalenese, and the like are used for this purpose. As most of the "hide poisons" are deadly poisons, the utmost care must be exercised in handling them.

Modern American Tanning gives the following directions for making "hide poison:"

Dissolve 40 pounds of red or white arsenic and 1 pound of concentrated lye with water in a kerosene barrel. Allow this mixture to stand for one week. Two pailfuls of this mixture, poured into an oil barrel full of water, give a solution ready for use.

EXHIBIT D

Excerpts from Massachusetts Contingency Plan – Background Levels of PAHs and Metals in Soil, May 2002.

Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil

Updates: Section 2.3 *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1992)

Discussion

Polycyclic Aromatic Hydrocarbons ("PAHs") are ubiquitous and consistently present in the environment and are typically formed during the incomplete burning of organic material including wood, coal, oil, gasoline and garbage. PAHs are also found in crude oil, coal tar, creosote and asphalt. Historically, PAHs have been associated with human activities such as cooking, heating homes and industries and fuel for operating automobiles, although low levels of PAHs are also present in the environment from natural sources, such as forest fires. Their presence in the environment at higher concentrations is an artifact of habitation and is due to the widespread practice of emptying fireplaces, stoves, boilers, garbage, etc. in rural and urban areas over the past several hundred years. As a result, it is very common to detect "background" levels of PAHs in soils. Metals are both naturally occurring and found in man-made materials (such as paint, fuel, fertilizers and pesticides) widely distributed in the environment. Naturally occurring metals present in wood and coal are often found concentrated in ash residue.

DEP has obtained background data from various sources documenting the concentrations of PAHs and metals in soil affected by human activities, particularly soil associated with wood ash and coal ash. These levels are representative of typical concentrations found in areas with fill material, *not* pristine conditions. DEP has also compiled background soil data for metals that are representative of undisturbed, natural conditions.

The identification of generic values for PAHs and metals in soil is intended to streamline the risk characterization process (310 CMR 40.0900) and determination of applicable Response Action Outcome Category (310 CMR 40.1000). Nothing in this Technical Update obviates the need to establish location-specific background conditions for other purposes, such as compliance with the anti-degradation provisions of the Massachusetts Contingency Plan ("MCP") described at 310 CMR 40.0032(3).

Definition of Background (310 CMR 40.0006)

Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

(a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecological conditions, or atmospheric deposition of industrial process or engine emissions;
(b) attributable to coal ash or wood ash associated with fill material;
(c) releases to groundwater from a public water supply system; or
(d) petroleum residues that are incidental to the normal operation of motor vehicles.

EXHIBIT E

Comments Regarding USEPA's Evaluation of Alternatives Using the Nine Criteria Required in the National Contingency Plan

EXHIBIT E

Comments Regarding USEPA's Evaluation of Alternatives Using the Nine Criteria Required in the National Contingency Plan

Introduction

de maximis, inc., on behalf of the Martin Aaron PRP Group, has compiled the following comments regarding USEPA's evaluation of alternatives using the nine criteria listed above. ***de maximis*** has concluded that USEPA has not adequately demonstrated that its Preferred Alternative for soil, S-4 (excavation and off-site treatment and disposal) or its Preferred Alternative for groundwater, G-5 (extraction, treatment and discharge to the CCMUA) provide the best balance of tradeoff's among the alternatives.

The National Contingency Plan (NCP) requires that USEPA select a remedy that is cost-effective, permanent and provides the best balances of the following nine criteria:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume
5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

Criteria 1 and 2 are considered by USEPA to be "Threshold Criteria" and statutorily must be satisfied in order for an alternative to be eligible for selection. If an alternative does not meet these alternatives, it cannot be carried forward in the evaluation process. Criteria 3 through 7 are considered "Balancing Criteria". USEPA must identify which of these criteria vary significantly and focus its evaluation on these factors. Criteria 8 and 9 are considered "Modifying Criteria" and are to be formally assessed by USEPA after the public comment period.

I. Comments on the Evaluation of the Threshold Criteria

Overall Protection of Human Health and the Environment

On page 14 of the PRAP, USEPA states that:

> *"Alternatives S2 through S6 are **all** considered protective of human health because they **all** prevent direct contact with contaminated soils in excess of the direct contact Cleanup Goals".* (Emphasis added)

Similarly, relative to its Preferred Alternative for groundwater, USEPA states on page 15 of the PRAP that:

> *"The no further action alternative is not considered protective because it does nothing to prevent exposure to contaminated groundwater in the future, which would result in unacceptable future risk. **The remaining alternatives are considered protective.**"* (Emphasis added).

Therefore, USEPA has not demonstrated or concluded that its Preferred Alternative for soil (S4) or for groundwater (G5) provide a greater degree of overall protection of human health and the environment than the other alternatives (except the "No Action" alternative.). Therefore, all alternatives pass this criterion and are carried forward in the evaluation.

Compliance with ARARs
On page 15 of the PRAP, USEPA's states relative to the soil alternatives that:
*"Location and Action-specific ARARS would be met under **all** active alternatives".* (Emphasis added).

Nowhere in the FS or PRAP does USEPA conclude that alternatives G2 through G5 do not comply with ARARs. In fact, USEPA concludes that only alternative G1 (the "No Action" Alternative) does not meet this Threshold Criterion and was therefore eliminated from further consideration at this point in the evaluation.

Therefore, all alternatives meet this criterion and must be evaluated (balanced) by the remaining criteria.

II. Comments on the Evaluation of the Balancing Criteria

Long-term Effectiveness and Permanence
USEPA's states on page 16 of the PRAP that:
"Alternatives S3 and S5 are ranked lower than S4 and S6 since they involve in-situ treatment of the soil sources areas, but are still effective and permanent in the long-term" (Emphasis added).

EPA concludes that soil Alternatives S3 and S5 are effective and permanent in the long-term USEPA has ranked Alternatives S3 and S5 as lower because it has *assumed* that the potential effectiveness of these in-situ remedies are more uncertain. Yet, USEPA has not conducted any treatability or pilot studies to confirm those assumed uncertainties and therefore has not substantiated its ranking of these alternatives. Because EPA appropriately considered S3 and S5 effective and permanent, it therefore cannot use these as a basis for alternative selection.

Relative to groundwater, EPA concludes in the PRAP on page 16 that
*"Alternative G4 ranks **higher** than Alternatives G3 and G5 for the arsenic plume because the arsenic is quickly treated after injection, curtailing or eliminating mobility."* and,

*"Alternative G4 ranks **lower** than its Preferred Alternative G5 for the VOC portion of the plume."*

USEPA has not demonstrated in the RI, FS or PRAP through testing or modeling that the MNA component of Alternative G4 will not provide for a permanent remedy for VOCs once the source control remedy is complete. In fact, by its own admission in its RI Report and elsewhere in the FS, USEPA concludes that the VOC portion of the plume is

undergoing natural attenuation as demonstrated by the groundwater monitoring data. Therefore, EPA has no basis to rank G4 lower than G5 relative to VOCs.

Conversely, USEPA indicates that its Preferred Alternative for groundwater (G5 – extraction and treatment) may in fact be *less* effective and *less* permanent compared to other alternatives. To the point and by its own admission, USEPA states in the PRAP that:

"...however, certain factors, such as the presence of silt and clay layers in the aquifer and the potential for dewatering of the zone of contamination may limit the effectiveness of the Preferred Alternative in reaching the groundwater Cleanup Goals in a reasonable time frame." [Emphasis added.]

Furthermore, USEPA concludes on page 4-14 of its FS that:

> *"It has been assumed that the system would be operated for 10 years to remove the majority of the contaminant mass (assumed to be seven and one-half pore volumes) and that MCLs in groundwater (with the exception of the shallow Upper PRM groundwater) will be met within the 10-year timeframe."*(Emphasis added).

It is clear from this statement that USEPA has assumed a 10-year pumping timeframe without engineering support and has doubts as to its effectiveness. Furthermore, the Shallow PRM Aquifer where remediation in 10 years is the zone of greatest arsenic contamination. The need to make multiple assumptions and exceptions relative to the performance of its Preferred Alternative illustrates why USEPA cannot conclude that its Preferred Alternative for groundwater –G5—will be more effective and provide longer-term permanence. To the contrary, by its own admission, it is likely that the remedy will not be effective in the areas of greatest contamination and may never achieve RAOs – therefore will be less effective and less permanent. On these bases, USEPA should have ranked its Preferred Alternative as weaker than other alternatives.

Reduction of Toxicity, Mobility, or Volume or Contaminants in Soil Through Treatment

USEPA's Preferred Alternative S4 for soil (excavation, treatment and off-site disposal) does not provide for a higher degree of toxicity reduction through treatment compared to in-situ stabilization. Both alternatives require treatment of the same volume of contaminants. USEPA has not conducted any studies to support its assumption that the other alternatives will be less effective at reducing toxicity through in-situ treatment.

USEPA has assumed that its preferred remedy for soil will provide for a greater reduction in contaminant mobility because the contaminants are removed from the Site. USEPA. has not conducted any studies at the site to demonstrate that the in situ alternatives will not equally reduce contaminant mobility. USEPA is simply defaulting to the conclusion that removing the soils from the site reduces the contaminant mobility. There has been no real comparative evaluation done between alternatives.

USEPA's Preferred Alternative for soil does not provide for a greater reduction in the volume of contaminants because an in-situ remedy would need to address the same

volume of soil. USEPA's selected alternative simply moves the same volume of treated soil to another location.

Reduction of Toxicity, Mobility, or Volume or Contaminants in Groundwater Through Treatment

USEPA states in the PRAP that:
"Alternatives G4 and G5 offer a comparable level of improvement in mobility and toxicity reduction and would be rated higher than the hydraulic containment Alternative G3."
Therefore, this criterion does not provide USEPA with a basis to select Alternative G5 over Alternative G4.

USEPA maintains that its Preferred Alternative for groundwater will result in a *higher degree* of volume reduction because the contaminants are removed from the groundwater. USEPA cannot make this conclusion, when as previously discussed, its own FS acknowledges that the most contaminated zone of the aquifer might not be remediated by its Preferred Alternative.

Natural attenuation can also result in a reduction of the volume of contaminants. Without appropriate monitoring of that degradation (and volume reduction), USEPA has no basis to conclude that its Preferred Alternative will result in a higher degree of volume reduction.

Short-term Effectiveness
USEPA states in the PRAP on page 17 that:
"Alternatives S4, S5 and S6 achieve remedial action objectives more quickly than Alternatives S2 and S3 since they each involve some type of excavation, which takes less time to implement."

On page 17 of the PRAP, USEPA estimates that the two in-situ alternatives for soil, S3 and S5 will take approximately 2.5 years to implement. First, that is inconsistent with the USEPA's recognition that Alternative S3 will take longer than S5. Second, USEPA has not conducted any pilot or bench scale testing to be able to quantify the time for the in-situ alternatives to achieve the RAOs.

The time frame of 2.5 years for Alternative S3 (SVE and soil stabilization) is driven more by the time for SVE than for soil stabilization. The time for soil stabilization would be more similar to excavation (USEPA's Preferred Alternative).

Although EPA estimates its Preferred Alternative for soil will take approximately 5 months to complete, none of the remedial alternatives for soil are estimated by USEPA to take more than 2.5 years to complete. Notwithstanding the above-mentioned concern regarding the lack of pilot or bench scale testing, 2.5 years to remediate the soil at a Superfund site is not an uncommon or unreasonable time period. EPA has used SVE as a treatment option at numerous sites throughout the country.

USEPA conveys in the PRAP that its Preferred Alternative for groundwater (G5) is expected to achieve MCLs in groundwater in as little as 10 years. As detailed by the evaluation by other professionals (see report by McLane Environmental) USEPA's calculations likely underestimate the remedial time for arsenic by a factor of 10 (e.g. McLane estimates that pore flushing will take over 100 years for arsenic.). Secondly, it does not appear that USEPA has factored into its calculation of time frame the influence of contaminated groundwater flowing on to the site. This influx of contamination will increase the time frame estimated by USEPA for Alternative G5. Third and as mentioned above, USEPA has expressed serious concerns that the site-specific conditions may make it not possible to achieve the groundwater. If that is true, then USEPA's estimation of time for its Preferred Alternative has little meaning. USEPA's Preferred Alternative should be ranked lower than certain other alternatives for the sole reason that USEPA is uncertain that pump and treat will work at all for the most contaminated groundwater zone.

Implementability

In the PRAP, USEPA expresses concerns regarding the uncertainties associated with the implementation of alternatives other than its Preferred Alternative. These concerns do not appear in the FS. In fact, USEPA concludes in the FS that:
"all alternatives can be implemented at the site, and no technical or administrative implementability problems are expected for any of the alternatives" (FS p.5-11).

Therefore, USEPA has not adequately explained the discrepancy between PRAP and the FS. This criterion, therefore, does not affect the balance of the comparison between certain alternatives.

Cost

In Section 7 of the PRAP, USEPA lists the estimated cost for each of the soil and groundwater alternative but makes no comparative evaluation.

Conclusion Regarding USEPA's Evaluation of the Balancing Criteria

USEPA has not demonstrated that its Preferred Alternative for soil provides the best balance among the evaluated alternatives. This can be summarized for the soil alternative as follows:

- USEPA concludes that soil alternatives S3, S4, S5 and S6 will all be effective and permanent. They all pass the threshold criteria. USEPA's assumption that S3 and S5 should be ranked lower is unfounded, as USEPA has not completed the necessary pilot or bench scale testing to support that assumption.
- USEPA's decision to excavate and remove the soil from the site does not result in a greater reduction in volume compare to an in-situ remedy. Both alternatives address the same volume of contaminants. USEPA's decision to excavate and remove the soil does not necessarily provide for a greater reduction in toxicity or mobility compared to an in-situ technology.
- USEPA has concluded that soil alternative S4, S5 and S6 all provide for short-term effectiveness. USEPA assumes that S4 will have a greater short-term

effectiveness compared to S3, however this assumption is driven by the SVE component of alternative S3, and not the soil stabilization component for arsenic.

- USEPA has concluded that all of the alternatives can be implemented without limitation.
- USEPA's Preferred Alternative for soil is significantly more costly than the other alternatives, such as in-situ stabilization.

Similarly, USEPA has not demonstrated that its Preferred Alternative for groundwater provides the best balance of the Balancing Criteria. In fact, it is believed that USEPA's Preferred Alternative for groundwater provide one of the weaker balance of these criteria, as follows:

- The primary contaminant in groundwater is arsenic and USEPA recognizes that the remediation of arsenic in groundwater is more complex that the remediation of VOCs. USEPA ranks in-situ Alternative G4 greater in long-term effectiveness and permanence than its Preferred Alternative in addressing arsenic, yet selects its Preferred Alternative because is assumes MNA will be less effective for the VOC contamination. This assumption, as noted above, is unfounded.
- USEPA concludes that Alternative G4 and G5 are equal in their ability to reduce the toxicity and mobility of contaminants. Yet this is contradicted by it's own FS, which acknowledges the likelihood that pump and treat will likely not remediate the most contaminated zone in the aquifer.
- USEPA's Preferred Alternative for groundwater has not been shown to provide a greater degree of short-term effectiveness compared to other alternatives. To the contrary, USEPA (as noted above) concedes that its Preferred Alternative may never achieve the RAOs to due limitations at the Site.
- USEPA concludes that all of the groundwater alternatives are implementable.
- USEPA has chosen the alternative with the greatest cost. Moreover, because of its acknowledged uncertainties regarding short and long-term effectiveness, USEPA has likely significantly underestimated the cost of its Preferred Alternative.

III. Comments on the Evaluation of the Modifying Criteria

State/Support Agency Acceptance

To the best of our knowledge, NJDEP is still evaluating the PRAP and therefore has not yet provided its acceptance of EPA's Proposed Remedy for the Site.

Community Acceptance

On behalf of the Martin Aaron PRP Group, ***de maximis*** attended the public meeting held on July 26, 2005. There were a significant number of residents and other members of the public that provided verbal comments on the remedy and also indicated they would be submitting written comments.

IV. Comments on USEPA's Summary of the Preferred Alternative Section

In light of the above-mentioned comments, we point out the following inconsistent and unsupported statements made by USEPA as the basis for selecting its Preferred Alternative.

1. USEPA summarily states:
   "The Preferred Soil Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal, and is expected to allow the site to be used for its reasonably anticipated future land use, which is commercial/industrial."

This summation is in direct contradiction to USEPA's statements in the PRAP, considering on page 14:

"Alternatives S2 through S6 are all considered protective of human health because they all prevent direct contact with contaminated soils in excess of the direct contact Cleanup Goals". (Page 14, PRAP)

Therefore, this criterion **does not support** the selection of USEPA's Preferred Soil Alternative S4 over Alternatives S2, S3, S5 or S6.

Second, USEPA's Preferred Soil Alternative **is not** the only alternative that will allow the site to be used in the future for a commercial/industrial purpose, since USEPA concludes that all soil alternatives can be completed in less than 2.5 years. Moreover, USEPA has not estimated the time to stabilize the soil for arsenic -- which is likely to be similar in time to excavation and removal.

2. USEPA summarily states:
   "The Preferred Soil Alternative reduces the risk within a reasonable timeframe, and at a cost comparable to other alternatives that use on-site treatment, and provides for long-term reliability"

First, USEPA concluded that its preferred alternative would take approximately 5 months while the in situ technologies would take approximately 2.5 years. Nowhere in the PRAP did USEPA conclude that 2.5 years is an unreasonable time frame. In fact, 2.5 years is not uncommon for a soil remedy at a Superfund site. The VOC remediation component and not the arsenic remediation component drive USEPA's time frame for the in-situ remedy.

Second, it is not appropriate to characterize the cost of Preferred Alternative S4 ($6,580,000) as being "comparable" to Alternative S3 ($3,630,000). This significant cost difference (e.g. nearly $3,000,000) should be justified by USEPA, which can only be accomplished by conducting the appropriate pilot testing and analysis to confirm the effectiveness of the lower cost alternatives.

Third, as noted above, USEPA concluded on page 16 of the PRAP that:

"Alternatives S3 and S5 are ranked lower than S4 and S6 since they involve in-situ treatment of the soil sources areas, but are still effective and permanent in the long-term" (emphasis added).

Therefore, the second USEPA summary statement is not supported.

3. USEPA summarily states:
   "Although S3 and S5 were similar in some respects, Alternative S4 was chosen because it has fewer uncertainties in addressing the Source Areas, at a cost comparable to S3 and S5."

First, the "uncertainties" referred to by USEPA are simply design parameters unknowns associated with the implementation of any in-situ alternative – items that are routinely and easily addressed through field studies, pilot studies and treatability studies prior to remedy selection.

Second, as noted above, the cost of Alternative S4 ($6,580,000) is not considered comparable to Alternative S3 ($3,630,000). The significance of this cost difference underscores that USEPA should conduct the studies to eliminate the "uncertainties" before defaulting to a much more costly remedy.

4. On page 19 of the PRAP, USEPA identifies a number of factors supporting its selected Alternative G5 over other groundwater alternative, as follows:
   "With the removal of the VOC Source Areas, natural attenuation may address the remaining VOCs in groundwater in a reasonable time frame; <u>however the same cannot be said</u> for the arsenic contamination. The removal of arsenic soil Source Areas, as recommended by EPA in this Proposed Plan, is <u>expected</u> to result in <u>some</u> reductions in groundwater arsenic levels, but residual arsenic levels are <u>expected</u> to persist in groundwater." (Emphasis added).

First, USEPA's FS identifies the potential that arsenic may undergo natural attenuation, but monitoring after source removal is needed before the time frame can be determined.

Secondly, USEPA's conclusion that arsenic will not undergo natural attenuation is clearly based on a number of expectations -- not on the basis of scientific studies. Therefore, USEPA's assertion that arsenic will not undergo natural attenuation in a reasonable time frame is not supported.

Thirdly, and most important, USEPA should not dismiss natural attenuation for VOCs as a remedy for groundwater.

"While the VOC plume may attenuate without groundwater remediation, Alternative G5 would speed that process and aggressively reduce the arsenic contaminant concentrations is a relatively short time frame (10 years)."

The timeframe USEPA estimates is unsupported by its own documents -- the FS concludes that remediation of the most contaminated groundwater zone may never occur, due to dewatering or the presence of silts and clays in the zone where contaminants are concentrated. To that point, and surprisingly, USEPA devotes the

next paragraph in the PRAP to reasons why the pump and treat alternative might not achieve the groundwater RAOs.

"The Preferred Alternatives are believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time."

First, USEPA's Preferred Alternative does not provide the best balance of tradeoffs among the alternatives, as detailed above. Secondly, USEPA qualification "based on information available to EPA at this time" reflects the fact that USEPA does not have the appropriate amount of information to make the decision at this time.

"USEPA believes the Preferred Alternative would be protective of human health and the environment and would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alliterative treatment technologies to the maximum extent practicable."

First, this statement is not true because the Preferred Alternative is not cost-effective and does not use alternative treatment technologies to the maximum extent practicable. Secondly, this statement would be more appropriate for an alternative that combines soil excavation for VOCs, soil stabilization for arsenic, natural attenuation for VOCs in groundwater, and geochemical/in-situ treatment for arsenic in groundwater.

V. Conclusion

USEPA's conclusion that its Preferred Alternative for the Site provides the best balance of tradeoffs among the alternatives is not supported by its own documents. Compared to other technologies, such as soil stabilization, the removal of the VOC and arsenic Source Area soils is:

- not more protective of human health and the environment
- not more permanent
- not more compliant with ARARs
- does not necessarily provide and greater reduction in contaminant toxicity, mobility or volume through treatment
- does not provide for a greater level of short-term effectiveness
- is not more easily implementable
- and certainly is not the most cost-effective.

When comparing, for example, the pump and treat alternative (G5) to Alternative G4 (Geochemical fixation and MNA):

- USEPA concludes G4 is as protective and permanent as G5.
- Both G4 and G5 comply with ARARs.
- G4 has the potential to provide a greater reduction in contaminant toxicity, mobility and volume, especially since USEPA concludes its own groundwater remedy (pump and treat) might not ever address the most contaminated groundwater zone at the Site.

- G4 may be more effective in the short tem, especially since USEPA concludes its own groundwater remedy (pump and treat) might not ever address the most contaminated groundwater zone at the Site.
- Neither G4 nor G5 have limitations on technical implementation. However, it should be noted that G4 would not require the installation of wells, piping, utilities and other implementation complexities as USEPA's Preferred Alliterative G5.
- G4 has the potential to be significantly more cost-effective, especially given USEPA's own conclusion that the groundwater remedy (pump and treat) might not ever address the most contaminated groundwater zone at the Site and may require additional wells and other adjustments to be effective.