EPA/ROD/R02-02/085
2002

EPA Superfund
Record of Decision:

LIBERTY INDUSTRIAL FINISHING
EPA ID: NYD000337295
OU 01
FARMINGDALE, NY
03/28/2002

United States Environmental Protection Agency
Region II
New York, New York
March 28, 2002

RECORD OF DECISION
DECISION SUMMARY

LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE

FARMINGDALE, NASSAU COUNTY, NEW YORK

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Liberty Industrial Finishing Superfund Site
Village of Farmingdale, Town of Oyster Bay, Nassau County, New York

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the selection by the U.S. Environmental Protection Agency (EPA) of the remedial action for the Liberty Industrial Finishing site (the Site) in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601 et seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300. An administrative record for the Site, established pursuant to the NCP, 40 CFR §300.800, contains the documents that form the basis for EPA's selection of the remedial action(see Appendix III).

The New York State Department of Environmental Conservation (NYSDEC) has been consulted on the planned remedial action in accordance with CERCLA §121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy represents the comprehensive remedial action for the Site. It addresses: the soil contamination present primarily on the western half of the property in the Wastewater Disposal Basins, the Building B Basement, and the Northwest Disposal Area; numerous contaminated subsurface features present on the eastern portion of the property; the on-property and off-property groundwater contamination; and localized contamination in pond sediments in nearby Massapequa Creek. The ROD also includes a contingent remedy for soils, described below, to be implemented if the Town of Oyster Bay does not acquire the western portion of the property for park land use.

The Selected Remedy will restore groundwater to its best beneficial use, a source of drinking water, through active remediation of the aquifer and elimination of contaminants in soils that continue to contaminate the groundwater. The removal of contaminants in Site features will eliminate the future risk posed to construction workers. Remediation of contaminated sediments from Pond A will eliminate any potential adverse effects to ecological receptors within the Massapequa Creek from exposure to these contaminants.

The major components of the Selected Remedy include:

Soils:

- excavation and off-Site disposal of all soils contaminated above groundwater protection levels, estimated at 73,100 cubic yards,

- removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features (structures), and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

Groundwater:

- continued operation of the ongoing interim groundwater treatment system that is being converted to a conventional pump-and-treat system to address the groundwater underlying the Site property contaminated by previous operations at the Site,

- continuation of the interim groundwater action by construction and operation of a conventional pump-and-treat system to address groundwater underlying the Site property which is believed to have been contaminated by an upgradient source,

- construction and operation of a conventional pump-and-treat system to treat off-property groundwater contamination,

- implementation of a groundwater monitoring program, and

- institutional controls to prohibit installation or use of groundwater wells for human consumption.

Massapequa Preserve:

- excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments within Pond A of the Massapequa Preserve, and

- implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve.

The Town of Oyster Bay is in the process of acquiring the western portion of the Site for the purpose of expanding Ellsworth Allen Park. If the Town does not complete the acquisition of the western half of the property within a time frame of approximately 6-8 months, or otherwise satisfactorily demonstrate to EPA that it will acquire the property for such purposes within a reasonable time frame, the following contingency remedy for soils will be implemented:

- excavation and off-Site disposal of approximately 25,600 cubic yards of soils contaminated above Site-specific cleanup levels,

- placement of an impermeable cap over 8.75 acres of low-level contaminated soils with a requirement to maintain the integrity of the cap,

- removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features (structures), and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses and institutional controls to prevent activities that could compromise the integrity of the cap.

In addition to the contingent remedy, it should be noted that approximately two-thirds of the features specified in the selected soil remedy and contingent soil remedy are expected to be addressed separately pursuant to an Administrative Order on Consent issued to the Site property owners on March 27, 2002. If the property owners fail to implement this work, then all of the Site features will be addressed as part of the Selected Remedy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121, 42 U.S.C. §9621: (1) it is protective of human health and the environment; (2) it achieves a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains the legally applicable or relevant and appropriate requirements (ARARs) under Federal and State laws; (3) it is cost-effective; (4) it utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable; and (5) it satisfies the statutory preference for remedies that employ treatment to reduce the toxicity, mobility, or volume of the hazardous substances, pollutants or contaminants at the Site.

A five-year review of the remedial action pursuant to CERCLA §121(c), 42 U.S.C. §9621(c), will be necessary to ensure that the remedial action remains protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

> Chemicals of concern and their respective concentrations (see ROD, pages 10 - 25);
>
> Baseline risk represented by the chemicals of concern (see ROD, pages 25 - 38);
>
> Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 38 - 40);
>
> Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, pages 44, 48, and 51); and

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 decision) (see ROD, pages 65 - 71).

William J. Muszynski

Jane M. Kenny
Regional Administrator
EPA-Region 2

3/28/02

Date

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SITE NAME, LOCATION AND DESCRIPTION

The Liberty Industrial Finishing site (the Site) is located approximately one mile south of Bethpage State Park in the Town of Oyster Bay, Village of Farmingdale, Nassau County, New York (see **Figure 1**). The Site includes approximately 30 acres of property known as 55 Motor Avenue and is designated on the Nassau County Tax Map as Lots 327, 328 and 329 of Block 518, Section 48. The property is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east and a small county park, Ellsworth Allen Park, to the west. The northwest corner of the Site abuts property owned by the South Farmingdale Water District which operates two deep public water supply wells at this location which is sidegradient of the Site. The surrounding area is primarily residential with several commercial establishments on the major roads. Approximately ten schools, both primary and secondary, are located within 1.5 miles of the Site. **Figure 2**, which was developed based on historical records, depicts former process facilities as well as potential contaminant source areas at the Site.

Currently, approximately half the Site property (the western portion, Lot 327) consists of primarily vacant land that abuts the park. The other half of the Site (the eastern portion, Lots 328 and 329) contains approximately ten buildings which are leased to a variety of tenants engaged in light industrial activities, such as trucking, warehousing, automobile parts salvaging operations, and product distribution.

The Site terrain is generally flat with numerous areas of standing water after heavy rainfall. There are no streams or drainage ditches on the Site property; however, there are private storm drains located throughout the property. Nassau County storm drains are located along Motor Avenue and Roberts Street, which ultimately drain into the headwaters of Massapequa Creek. This creek passes through the Massapequa Preserve and ultimately discharges into South Oyster Bay on the southern coast of Long Island.

The Site is situated on the glacial outwash plain of Long Island. The uppermost aquifer, the Upper Glacial, is estimated to be 85 feet thick beneath the Site. The depth to the water table is generally approximately 21 feet below ground surface (bgs), although the Site groundwater table fluctuates between 15 and 21 feet bgs. The saturated portion of the Upper Glacial aquifer, with a thickness of 64 feet, begins at the water table and extends down to 85 feet bgs. The Upper Glacial aquifer is underlain by the Magothy aquifer which is approximately 700 feet thick in the vicinity of the Site. Groundwater aquifers underlying the Site are classified as Class GA pursuant to 6 New York Codes, Rules and Regulations Parts 700-705 (6 NYCRR Parts 700-705, effective

September 1991). The Class GA standards apply to any groundwater, surface water body, aquifer or water course from which water is regularly taken for drink or which has been classified for present or future public beneficial use or source for domestic purposes. Similarly, the groundwater aquifers are classified as Class IIA by the U.S. Environmental Protection Agency (EPA) in that the aquifers are current or potential sources of drinking water.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site is a former aircraft parts manufacturing and metal finishing facility that began its operation in the late 1930's. Kirkham Engineering and Manufacturing Company purchased a portion of the Site property in 1937. In 1940, Kirkham changed its name to Liberty Aircraft Products Corp. and purchased the remainder of the 30-acre parcel. From 1940 to 1944, the federal government utilized the Site as a defense plant to develop and maintain production of materials needed for World War II. Materials used in Site operations included volatile organic compounds (VOCs) such as cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE); inorganic compounds containing cadmium, chromium, and cyanide; as well as other materials such as caustics and acids. Throughout most of the period of industrial operation, wastes containing these materials were discharged untreated into below-grade sumps, underground leaching chambers, and unlined, in-ground wastewater disposal basins.

Ownership of and operations at the Liberty site changed numerous times from 1957 until 1986.

In 1957, the Site was sold by Liberty Aircraft and was converted into an industrial park subject to a 25-year lease of the Site to the successor of Liberty Aircraft. Aircraft parts manufacturing was discontinued and a variety of other operations were conducted by tenants at the Site over the years, including metal plating and finishing operations, fiberglass product manufacturing, furniture manufacturing, and warehousing. Metal-plating operations were discontinued at the Site in 1978.

In 1978, the New York State Department of Environmental Conservation (NYSDEC) instituted an enforcement action under State law against Liberty Industrial Finishing Corporation, the last company to conduct plating operations at the Site. Liberty Industrial Finishing Corporation entered into an agreement with NYSDEC for cleanup of the Site. Limited cleanup activities were conducted which consisted of the partial removal of soils from two Former Wastewater Disposal Basins.

In April 1984, the then owner of the Site, Four J's Company, among others, were brought into the State enforcement proceedings by Liberty Industrial Finishing and entered into an Order on Consent with NYSDEC to conduct a remedial investigation and feasibility study (RI/FS) under State law. An RI report was submitted to NYSDEC in November 1985; however, this report was not approved by NYSDEC. In March 1987, NYSDEC entered into a second Order on Consent with 55 Motor Avenue Company, who had assumed Four J's obligations under the first NYSDEC order, for an interim action involving the removal of contaminated soils from the Former Wastewater Disposal Basins. In July/August 1987, approximately 4,000 tons of metals-contaminated soils from the Sludge Drying Bed and Former Wastewater Disposal Basins were excavated and disposed of off-Site.

On June 10, 1986, the Liberty site was placed on the National Priorities List of federal hazardous substance sites. In May 1990, EPA assumed the role of lead agency for the Site from NYSDEC.

In September 1990, EPA utilized its contractor, Roy F. Weston, Inc. to conduct the RI/FS at the Liberty site. Field work was conducted from November 1991 to July 1992 and included various contaminant source and contaminant migration investigations and an ecological investigation. The initial RI report was completed in January 1994. This initial RI report defined much of the contamination at the Site, such as in soils on the western portion of the property, and in the Upper Glacial (shallow) aquifer. However, because the Magothy (lower) aquifer, the Massapequa Creek, and the majority of the soils and subsurface features consisting of vaults, drains, pipes, underground leaching chambers, underground storage tanks, and the northern and eastern sanitary leaching fields on the eastern portion of the property were not fully characterized during the initial RI, EPA determined the need to conduct a supplemental RI/FS for these areas.

Due to repeated instances of excavation and other disturbances, in March 1992, EPA issued an Administrative Order to the current Site owners under Sections 104(e) and 106(a) of CERCLA. Under this order, the property owners were required to refrain from excavating, disposing of, moving, or constructing upon soils at the Site and to refrain from taking any other actions, including disposal activities, that might interfere with EPA's investigation or remediation of the Site.

Based on the results of the initial RI report, EPA conducted a Removal Site Evaluation at the Liberty Site during late 1993 and early 1994, and subsequently determined that several localized areas of the Site posed an immediate risk to trespassers who may come in contact with these areas. These included electrical transformer areas contaminated with polychlorinated biphenyls (PCBs), wastes contained in underground storage tanks, and drums located at the Site. On August 30, 1994, EPA entered into an administrative order on consent (Removal AOC) to nine potentially responsible parties (PRPs) for performance of a time-critical removal action to remove immediate hazards posed primarily by PCBs and transport them to appropriate facilities for treatment and disposal. On August 30, 1994, EPA also issued a unilateral administrative order to six other PRPs directing them to coordinate with the Removal AOC respondents and to participate in the performance of the work required by the administrative order on consent or, in lieu thereof, to pay for their share of that work. Pursuant to the Removal AOC, the removal action began in late 1994 and all field work was completed in the Fall of 1995. This action eliminated the current-use risks associated with the Site. EPA also took steps to restrict access to areas of concern by installing fencing, repairing existing fencing, and posting warning signs.

After EPA released the initial RI report, the Agency had extensive discussions with the community, local officials, and PRPs on future land use and preliminary remedial alternatives for the western Site soils. A stakeholders group representing these parties was established and a mediator was brought in to facilitate the discussions. The mediation process officially began in October 1995 and initially consisted of private meetings and telephone conversations with various stakeholders, which were followed by seven joint sessions among all the stakeholders (the first session occurred on November 21, 1995). However, a consensus about the future land use could not be reached by the community, local officials and the PRPs. EPA ultimately decided, in April 1996, that for the purposes of identifying appropriate remedial alternatives, the reasonably anticipated future land use would be commercial/industrial primarily because the Site was zoned for industrial use from the 1920's until the mid-1980's and has been used for light industrial activities since that time.

In October 1996, EPA completed and released to the public a draft initial FS report which evaluated cleanup alternatives for addressing the contaminated soils on the western portion of the Liberty site. In accordance with the Agency’s decision and rationale regarding the reasonably anticipated future land use provided above, remedial alternatives presented in this draft initial FS report were developed for future commercial/industrial land use. Based on a supplemental soil sampling investigation that was conducted in January 1997, EPA revised the draft initial FS report.

In July 1997, EPA released an initial FS report and Proposed Plan for the remediation of the contaminated soils on the western portion of the Site to the public for comment. A public meeting and a public availability session were held in August 1997 and September 1997, respectively. Many commentors objected to EPA's commercial/industrial land use determination and also expressed concern about the lack of progress in addressing contaminated groundwater. In October 1997, after evaluation of the public comments received on the July 1997 Proposed Plan, EPA announced its decision to postpone the selection of a remedy for the soils on the western portion of the Liberty site to allow time for the Agency to assess further the impact of the soil remedy on the scope and duration of the future groundwater remedy.

On January 24, 1997, EPA issued an administrative order on consent to five PRPs for performance of the supplemental RI/FS (RI/FS AOC), to further characterize Site soils, Site groundwater and Massapequa Creek. Field work for the supplemental RI/FS was conducted from May 1997 to January 2000.

At the September 1997 public availability session, EPA also announced that it would move forward with an action to prevent the significantly contaminated portion of the groundwater contaminant plume (containing both VOCs and metals) from continuing to migrate from the Site until the future long-term comprehensive groundwater remedy was implemented. On March 31, 1998, the EPA selected an interim groundwater action to be performed as a non-time-critical removal action under CERCLA. On August 3, 1998, EPA issued a unilateral administrative order (Removal UAO) to all of the PRPs other than the two federal PRPs directing them to implement the interim groundwater action. The interim groundwater action, which addresses the groundwater plume known to originate at the Site, is being implemented by Coltec Industries with the cooperation of the two federal agency PRPs. Pilot testing of various innovative technologies for the interim groundwater action (similar to those of EPA's selected groundwater remedial alternative, discussed herein) began in December 1998 and was completed in May 1999. Construction of the full-scale interim groundwater treatment system began in November 1999. Treatment for VOCs was initiated in

January 2000, while treatment for metals was initiated in August 2000. However, various operational problems of significant nature that persisted for close to two years prevented the interim groundwater treatment system from continuous operation and effective treatment of groundwater contamination. As a result, in January 2002, EPA directed the PRPs to begin the process of converting the on-Site system into a conventional pump and treat system.

Additional information subsequently became available to EPA regarding the future use of the Site. On June 10, 1999, the Town of Oyster Bay released a study entitled “Preliminary Assessment of Utilizing the Western Portions of the Liberty Industrial Finishing Site for Parkland (May 7,1998)” which indicated a potential recreational use for the far western portion of the property. And, as discussed below, between July 2001 and March 2002, the Town took significant steps to acquire title to all or most of the western portion of the Site property for the purpose of expanding the adjacent Ellsworth Allen park and utilizing the property for recreational purposes. In December 2000, EPA was advised by the Town of Oyster Bay and by the owners of the Liberty site property, that the property owners had made application to the Town of Oyster Bay for a “special use permit” to permit the redevelopment of the easternmost ten acres of the Liberty site. The proposed project includes a supermarket and fueling facility/convenience store, uses that would be consistent with the anticipated commercial/industrial land use for the Site.

On March 27, 2002, EPA issued an administrative order on consent (Index number CERCLA-02-2002-2013) (the Features AOC) to four respondents who currently own and operate the real property included within the Site. The Features AOC requires those respondents to, among other things, i) investigate and remediate below-grade sumps, vaults, drains, pipes, underground leaching chambers, underground storage tanks and other features located on the eastern portion of the Site, as well as to investigate and, if necessary, to remediate the northern and eastern sanitary leaching fields which are also located on the eastern portion of the Site and to the extent that those features or leaching fields lie within the approximately ten acres that are planned by the Site owners for demolition in preparation of the Supermarket/fueling facility development; and ii) remediate by excavation and off-Site disposal an approximately 500 cubic yard mound of contaminated soils and other materials currently located on the western parcel of the Site near to the eastern parcel boundary. This ROD also selects all of the work required by the Features AOC, but subject to its satisfactory completion pursuant to the Features AOC.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

As documented in the previous section, EPA had significant interaction with the community to discuss various reports proposed, proposed remedial efforts, and land use issues. The significant level of community input continued during the public comment period for the comprehensive remedy.

Upon completion of the supplemental investigations, EPA released supplemental RI/FS reports and the Proposed Plan to the public on April 10, 2001 and July 23, 2001, respectively. The July 2001 Proposed Plan, the supplemental RI/FS reports, and all other documents and information upon which the selected remedy is based were made available to the public in the administrative record file at the EPA Records Center in Region II, located at 290 Broadway, 20th Floor, New York, and also at the information repository established and maintained at the Farmingdale Public Library, located at 116 Merritt Road, Farmingdale, New York. The notice of the public meeting and availability of the above-referenced documents appeared in two newspapers, Newsday and the Farmingdale Observer on July 23, 2001 and July 27, 2001, respectively. These notices also announced a public comment period on the July 2001 Proposed Plan and supporting documentation from July 23, 2001 through August 22, 2001. The notice, as well as the July 2001 Proposed Plan, were also mailed to close to 700 interested parties on the Site mailing list. A press release announcing the public meeting and comment period was issued on August 1, 2001. On August 9, 2001, EPA held a public meeting at the Farmingdale Public Library to discuss remedial alternatives, to present EPA’s preferred remedial alternatives, and to provide an opportunity for the interested parties to present comments and questions to EPA.

Per the public’s request at the August 9, 2001 public meeting, EPA extended the public comment period by 30 additional days to September 21, 2001 and scheduled a separate public availability session for September 13, 2001. The notice of the public availability session and extension of the public comment period to September 21, 2001 appeared in the Farmingdale Observer and Massapequa Observer on August 24, 2001, August 31, 2001, and September 7, 2001, and in Newsday on August 28, 2001. The notice was also mailed to all interested parties on the Site mailing list. A press release announcing the same was issued on August 22, 2001.

However, because EPA's Region II office was closed due to the terrorist attacks on the World Trade Center (WTC), the September 13, 2001 public availability session was postponed. Also, because some public comments sent by regular mail were likely not received due to the closing of the postal facility in lower Manhattan, EPA further extended the public comment period to January 25, 2002 and rescheduled the public availability session for January 9, 2002. The notice of the public availability session and the public comment period extension appeared in the <u>Farmingdale Observer</u> and <u>Massapequa Observer</u> on December 14, 2001, December 21, 2001, and January 4, 2002, and in <u>Newsday</u> on December 12, 2001. The notice was also mailed to parties on the Site mailing list. EPA held the public availability session at the Farmingdale Public Library, to provide additional information and another opportunity to respond to comments and questions community members had regarding the proposed remedial alternatives.

Numerous comments were received on the supplemental RI/FS reports and the July 2001 Proposed Plan at the public meeting and the public availability session and throughout the public comment period. Comments and concerns raised by interested parties including members of the public relate to the use of innovative technologies for the comprehensive groundwater remedy; the discharge of treated groundwater; the extent of the Massapequa Creek remedy; human health and risk assessment issues; enforcement-related issues; however, the majority of comments received related to the preferred soil remedy. While there was a general sentiment among the commentors at the public meeting and the public availability session that EPA's preferred remedy was much improved relative to the preferred remedy described in the 1997 Proposed Plan, there was extreme dissatisfaction with preferred soil remedy, particularly with the component of the preferred remedy that would leave nearly 50,000 cubic yards of contaminated soils at the Site covered by an impermeable cap.

EPA received more than 400 letters, electronically and in writing, as well as verbal comments requesting that EPA change the proposed alternative for soil remediation from Alternative SL-2 (which would involve excavation and off-Site disposal of approximately 25,600 cubic yards of contaminated soils and capping of other lesser contaminated soils) to SL-3 (which would involve excavation and off-Site disposal of all contaminated soils that could potentially impact groundwater). Concerns were expressed over the long-term effectiveness of the 8.75-acre capping component of Alternative SL-2, with commentors asserting that the proposed cap would ultimately fail because effective cap maintenance, required to ensure the integrity of the cap and remedy, could not be guaranteed. The commentors insisted that Alternative SL-3 should be selected because it is a permanent remedy that minimizes the potential threat to the sole source aquifer underlying the Site which serves as the drinking water supply for 44,000 people, and because it is more reliable than Alternative SL-2 in protecting human health and the environment. EPA also received oral and written comments from the elected representatives of the community unanimously requesting that EPA select Alternative SL-3 for many of the same reasons cited by the community members. During the comment period. EPA also became aware that the Town of Oyster Bay (Town) had taken significant steps towards formalizing plans to acquire nearly all of the western portion of the Site, including the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town also requested that EPA select Alternative SL-3, because they felt Alternative SL-2 would be incompatible with the recreational uses planned for the property proposed for acquisition. Further discussions and written information provided by the Town resulted in EPA's determination that SL-2 would interfere with the Town's ability to use the park over the short and long term. This information caused EPA to re-evaluate Alternatives SL-2 and SL-3 against the criteria listed in the NCP which EPA uses to evaluate remedies including: permanence and long-term effectiveness. Based upon this re-evaluation and the evaluation criterion of "community acceptance," EPA determined that Alternative SL-3 should be the selected remedy contingent upon the Town's acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6 to 8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy. In the event that Alternative SL-2 becomes the selected remedy, EPA will provide written notice to all stakeholders on the EPA mailing list for the Site.

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

SCOPE AND ROLE OF OPERABLE UNIT

The remedy selected in this ROD represents a long-term comprehensive remedy to address the on-Site soil contamination, the on-Site and off-Site groundwater contamination, and localized contamination in pond sediments in Massapequa Creek downstream of the Site. The primary objective of the selected remedy is to reduce contaminant levels in affected media, including soils, groundwater, and pond sediments, to levels that are protective of human health and the environment.

The selected remedy will complement cleanup actions that have been and continue to be conducted under the removal program (described above): the 1994-95 time-critical PCB removal action that eliminated the current-use risks associated with the Site; the ongoing non-time-critical removal action (interim groundwater treatment system) that is treating the contaminated groundwater underlying the Site property; and the non-time-critical removal action to address the contaminated features, the 500 cubic yard mound of contaminated soils and the sanitary leaching fields.

SUMMARY OF SITE CHARACTERISTICS

The objective of the supplemental RI was to augment the initial RI data in order to more completely delineate the nature and extent of contamination at and emanating from the Site. In addition, an evaluation was also performed which established Site-specific cleanup concentrations in soils that would be protective of groundwater and would also be protective of human health for the most reasonably anticipated future uses of the Site property (commercial/industrial for the eastern portion and commercial/industrial or recreational for the western portion). Field work for the supplemental RI/FS was conducted by five of the Site PRPs pursuant to the RI/FS AOC, under EPA oversight, from May 1997 to January 2000. The supplemental RI/FS reports were issued in April 2001.

The results of the supplemental RI are summarized below by contaminated media, namely, soil, groundwater, and Massapequa Creek sediments. To assess the significance of the detected contaminants, a comparison was made in the supplemental RI report to applicable or relevant and appropriate federal and State environmental and public health requirements, and Site background conditions.

On-Site Soil Contamination

The initial RI and the supplemental RI confirmed several significant on-property source areas including the former

Wastewater Disposal Basins, the former Building B Basement area, the former Building B Ramp Pile, and the Northwest Disposal Area (see **Figure 2**).

The supplemental RI on-Site source investigation included the following field and analytical activities:

- ❏ geophysical investigation,
- ❏ soil gas survey,
- ❏ subsurface feature inspection and sampling,
- ❏ underground storage tank (UST) investigation,
- ❏ county storm drain sampling,
- ❏ soil screening and sampling conducted as part of a groundwater screening program, and
- ❏ comprehensive soil sampling program.

<u>Geophysical Investigation</u>

A geophysical investigation, using ground-penetrating radar (GPR) methods, was conducted at twelve (12) areas across the Site (see **Figure 3**). The objective of the GPR investigation was to further define and delineate suspected structures associated with leaching fields in specific portions of the Site, to identify the location of a possible basement structure beneath the floor slab of former Building D, and to verify the existence of suspected USTs at five on-Site locations. The results of the GPR surveys were used to locate soil and groundwater screening borings to further investigate these features.

<u>Soil Gas Survey</u>

A soil gas survey was conducted at the eastern paved portion (approximately 4 acres) of the Liberty property and along the south side of Motor Avenue to evaluate potential source areas for VOCs in subsurface soils or shallow groundwater (see **Figure 4**). The soil gas results from the eastern portion of the Site were used to optimize the location of soil and groundwater screening boring locations. The objective of collecting soil gas samples from the south side of Motor Avenue was to evaluate the presence of VOCs in shallow soils downgradient and off-property from the former

Wastewater Disposal Basins. A total of 78 soil gas samples were collected from the 42 borings and field-screened for total VOCs. Twenty-one percent of the screening samples were selected for off-property confirmatory laboratory analyses. Overall, the distribution of soil gas concentrations did not infer the presence of any significant VOC concentrations in soil and groundwater beneath the easternmost 4-acre portion of the Site.

Surface Feature Inspection and Sampling

A subsurface feature investigation and sampling program was undertaken in order to identify, describe, and determine the content of various sumps, vaults, drains, or other on-Site subsurface containment features that were located on the eastern portion but not sampled during the initial RI field program. In addition, the purpose of the sampling program was to provide an indication as to whether any of these features represents continuing sources to on-Site soil or groundwater contamination. **Table 1** and **Figures 5 and 6** summarize the locations of the 56 features that were considered during the CRI activities.

Of the 56 suspected or existing subsurface features (28 exterior and 28 interior) that were investigated, four subsurface features (SF-29, SF-44, SF-51, and SF-56) could not be located, but the remaining 52 subsurface features were inspected, described, accessed, and/or sampled. Of the 52 subsurface features, 30 were sampled for solids, aqueous material, or both. Of the 16 features that were found to contain aqueous material, 15 were sampled for aqueous analysis. Of the 33 features that were found to contain solids, 26 were sampled for solid analysis. The 15 aqueous samples and 26 solid samples were analyzed for VOCs, semivolatile volatile organic compounds (SVOCs), pesticides and PCBs, metals, and cyanide. In addition, 13 solid samples were analyzed to determine whether they are hazardous waste per the Toxicity Leachate Characteristics Procedure (TCLP), as regulated by the Resource Conservation and Recovery Act (RCRA). Sampling results indicated that the features do not represent significant sources of contamination (e.g., VOCs and metals) to on-Site soils or groundwater. However, the results did identify two SVOCs, namely, benzo[a]pyrene and dibenzo[a,h]anthracene, in concentrations as high as 0.041 milligrams/liter (mg/l) and 0.007 mg/l, respectively, in several of the subsurface features. These SVOCs do not present a potential threat to groundwater due to their limited mobility and low concentrations within the concrete subsurface features but would present a risk to future Site construction workers who may come in contact with these substances (as further discussed in detail in ***Human Health Risk Assessment section,*** below). TCLP analytical results indicate that none of the samples tested were RCRA hazardous by characteristic.

The volumes of the accumulated soil and aqueous materials (which is believed to be primarily derived from surface drainage) within the inspected subsurface features were estimated as follows: roughly half of the features did not contain any significant materials, and the average size of each feature is on the order of two feet in diameter, with solids having accumulated to an average thickness of two feet and aqueous having accumulated to an average thickness of half a foot. Therefore, a conservative estimate of solid and aqueous materials present would amount to about 6 cubic yards and 40 cubic feet, respectively.

With the exception of the subsurface features in Buildings H and W, the identified features do not appear to be connected to one another over large distances. In addition, the features are not being actively used for any recognizable or intentional purpose by the current tenants. In general, the majority of the inspected subsurface features are self-contained sumps, chambers, or small holes in the ground, some of which have accumulated mud, leaves and surface runoff through time. Many of the pipes that were occasionally observed in these features are now blocked by debris. The few features that are connected (e.g., in Building H), appear to be linked by 8-inch to 12-inch diameter pipes with an estimated total length of 2,000 feet. Assuming that all the pipes are clogged with solids, the resulting additional volume in the pipes would amount to about 18.5 cubic yards.

As discussed above in **SITE HISTORY AND ENFORCEMENT ACTIVITIES** Section, EPA previously issued the Features AOC to four respondents who currently own and operate the Site which requires that they investigate and, as necessary remediate, the subsurface features on the approximately ten-acre portion of the eastern part of the Site property which will be the subject of demolition activities in preparation for commercial redevelopment of the Site. This ROD addresses the investigation and remediation of all of the Features. However, selection of the remediation of the features is subject to prior performance pursuant to the Features AOC.

<u>Underground Storage Tank (UST) Investigation</u>

An UST investigation was conducted to evaluate the suspected locations of five tanks (See **Figures 5 and 6**), which were inferred by Roy F. Weston, Inc. during the initial RI to potentially exist based on their appearance on a fire insurance map, to determine if the tanks also received Site-related liquids such as waste solvents or PCB-bearing waste oils. Of the five suspected locations, four were investigated during the geophysical ground-penetrating radar (GPR) survey which indicated the presence of tank structures at three of the four investigated locations, north of Building C, between Buildings H and U, and north of Building A; the GPR survey did not indicate any evidence of a buried tank structure in a suspected area east of the former Building S pad. Due to safety considerations and inaccessibility, only UT-13, north of Building A, was sampled; one liquid sample was analyzed for RCRA hazardous waste characteristics for organics and metals, and pesticides and PCBs.

The analytical results did not indicate any significant concern for VOC or metal contamination; in addition, no pesticides and PCBs were detected. The TCLP analytical results indicate that the sample tested was not RCRA hazardous by characteristic. Fifteen soil samples were taken adjacent to the fifth suspected UST location north of the Wastewater Disposal Basins which showed limited VOC detections, all below NYSDEC soil guidance values (NYSDEC Technical and Administrative Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, Revision 4/95). However, as part of the selected remedy, a more complete investigation of the three tanks (a UST north of Building C, a UST between Buildings H and U, and the aforementioned fifth suspected UST inferred to be located north of the Wastewater Disposal Basins that was not investigated via GPR survey), including sampling and analysis of any contents, would be conducted as part of the comprehensive soil remedy to determine if any remediation is necessary.

As discussed in the previous subsection "Subsurface Feature Inspection and Sampling," EPA previously issued the Features AOC to four respondents who currently own and operate the Site which requires that they investigate and, as necessary remediate, these three underground storage tanks. And, as discussed in the previous subsection, this ROD addresses the investigation and remediation of the underground storage tanks, but subject to its satisfactory completion pursuant to the Features AOC.

County Storm Drain Sampling

Historic plans indicated that the on-Site storm drainage system was connected to the county storm sewer system (one former connection existed from the former Wastewater Disposal Basins and one former connection existed at the eastern portion of the Site). The county storm sewer discharges into the headwaters of Massapequa Creek near Spielman and Roberts Street. Soil/sludge materials present within five manholes accessing Nassau County storm sewer drains along the north side of Motor Avenue (See **Figures 5 and 6**) were sampled for Site-related constituents (VOCs, cadmium, chromium, or cyanide). Site-related VOCs (i.e., cis-1,2-DCE, TCE, and PCE) were not detected in any of the five samples. Cadmium and chromium were detected in concentrations which were all below their respective Site-specific soil cleanup levels.

Soil Screening and Sampling Conducted as Part of a Groundwater Screening Program

A soil screening and sampling program was implemented to evaluate the potential presence of dense nonaqueous phase liquid (DNAPL)[1] in the subsurface across the entire Site property and to acquire primarily supplemental VOC and metals soil data from locations surrounding suspected source areas. In all, 21 on-Site soil screening borings were completed (see **Figure 7**) and 28 soil samples were analyzed for VOCs, SVOCs, pesticides and PCBs, metals, and cyanide. In addition, four soil samples were collected from the suspected former Building D Basement area and the eastern portion of the Site for RCRA hazardous waste characteristics for organics and metals. Results from a DNAPL-screening test conducted, using a dye, concluded that the presence of DNAPL in on-Site soils is unlikely. Concentrations detected for VOCs, SVOCs, PCBs, and pesticides were below their respective TAGM values. Although cadmium and chromium were not detected above their respective Site-specific groundwater protection cleanup levels developed for the Site (details for the development of cadmium and chromium cleanup levels are provided below) in the subsurface soil samples (i.e., below 1 foot bgs), they were frequently detected at concentrations above their groundwater protection cleanup levels in surface soils and in soils sampled from the former Wastewater Disposal Basins

[1] Dense nonaqueous phase liquid (DNAPL) is a chemical (or mixture of chemicals) that is a liquid in its pure form, which does not readily mix with water but does slowly sink and dissolve in water. Generally, when present in the subsurface, DNAPLs slowly release vapor and dissolved phase contaminants, resulting in a zone of contaminant vapors above the water table and a plume of dissolved contaminants below the water table. DNAPLs, in general, are very difficult to remediate.

area. The TCLP analytical results indicate that the four soil samples tested were not RCRA hazardous by characteristics.

Comprehensive Soil Sampling Program

The comprehensive soil sampling program was conducted in the western portion and part of eastern portion of the Site to further delineate the horizontal and vertical extent of concentrations of cadmium, chromium, and VOCs. This effort was also conducted to derive Site-specific concentrations of cadmium and chromium that would be protective of the underlying groundwater aquifers using the Synthetic Precipitation Leachate Procedure (SPLP) methodology. Using a grid layout approach, 92 soil borings were completed to 20 feet bgs with samples collected at five-foot intervals, beginning with the collection of a surficial sample. The locations of the on-Site grid layout soil borings in Areas A through E are shown in **Figure 8**. Based on the analytical results for cadmium and chromium (total soil concentrations) and their corresponding SPLP extraction leachate from 18 samples collected from the four SPLP soil borings, 10 mg/kg cadmium and 143 mg/kg chromium were developed as Site-specific soil clean-up levels. (For comparison purpose, the NYSDEC TAGM values for cadmium and chromium are 10 mg/kg and 50 mg/kg, respectively.) Based, on NYSDEC’s Technical and Administrative Memorandum (TAGM), the following soil cleanup objectives were adopted for VOC contaminants: 0.7 mg/kg of TCE, 0.25 mg/kg of cis-1,2-DCE, and 1.4 mg/kg of PCE.

Thirty-four VOC soil samples were collected from Areas A, B, C, and the northern portion of Area D (excluding the former Wastewater Disposal Basins). Site-related VOCs were detected in only two soil samples (0.19 mg/kg and 0.13 mg/kg TCE), both within the Northwest Disposal Area and both below the TAGM value. Of the 42 VOC soil samples collected from the remainder of Area D (including the former Wastewater Disposal Basins), VOCs were detected in only five soil samples from locations near the former Wastewater Disposal Basins and at the northwest corner of former Building N. Two samples were above the TCE TAGM (0.7 mg/kg) with the highest concentration of 1.17 mg/kg; no other VOC TAGM values were exceeded. Of the 60 VOC soil samples collected from Area E, only one VOC, TCE, exceeded its TAGM value. TCE was detected in soil samples collected in the vicinity of the former Building B Basement area. The detected TCE concentrations ranged from 0.072 mg/kg to 5.09 mg/kg. Fifteen VOC confirmatory soil samples were collected from the former Building B Ramp Pile; none showed any Site-related VOC concentrations above respective TAGM values.

Three hundred and forty soil samples were collected from Areas A through E and analyzed for metals. The results indicate that the former Wastewater Disposal Basins, the former Building B Basement area, the Northwest Disposal Area, and the former Building B Ramp Pile are significant on-property source areas with cadmium and chromium concentrations well in excess of their respective soil cleanup levels; outside these source areas, cadmium and chromium were also detected, in scattered locations, in concentrations above their respective soil cleanup levels. In general, based on the supplemental soil sampling data for VOCs and metals, many of the locations where VOCs were detected in excess of their respective Site-specific soil cleanup levels are co-located with soils that also have cadmium and chromium concentrations above their respective soil cleanup levels.

Samples were also collected for RCRA TCLP characteristics analysis from the various source areas across the Site. Results indicated that samples collected from the Northwest Disposal Area, the former Building B Basement area, and the former Building B Ramp Pile tested positive for RCRA hazardous waste characteristics, due to metals contamination.

The supplemental RI results relating to on-property soils indicate that the majority, or approximately 95%, of the soil contamination is situated on the western portion of the Site (e.g., the former Wastewater Disposal Basins, the former Building B Ramp Pile, and the Northwest Disposal Area); the balance of the soil contamination is situated on the eastern portion of the Site (e.g., the Building B Basement area and the Building G floor drain).

The total volume of Site soils, based on above soil cleanup levels, that would require remediation was estimated at 73,100 cubic yards. In addition, due to the co-location of metal and VOC contaminants of concern, EPA believes that if the contaminated soils are remediated to 10 mg/kg cadmium and 143 mg/kg chromium soils cleanup levels, then the VOC contaminants in soils, estimated at approximately 500 cubic yards, will also be adequately addressed. The bulk of the contamination is located in four discrete areas: the Former Wastewater Disposal Basins (11,400 cubic yards), the Northwest Disposal Area (32,000 cubic yards), the Building B Basement (3,500 cubic yards), and the former Building B Ramp Pile (500 cubic yards); of these soils, the volume of RCRA hazardous soils was estimated to be 16,000 cubic yards. All 16,000 cubic yards of RCRA hazardous soils will be excavated for off-Site disposal and treatment at a RCRA Subtitle C facility. The remaining 25,700 cubic yards of soils represent low-level soil contamination that are scattered and present throughout seven acres of soils that abut the four discrete source areas.

The results from the soil gas survey and soil borings completed on the easternmost 4-acre portion of the Site by Main Street indicate it is free of any soil contamination above the soil cleanup levels and, therefore, would qualify for a partial Site delisting from the National Priorities List. Similarly, with the exception of land included in the Northwest Disposal Area, the Site property bordering Ellsworth Allen Park does not appear to have been impacted by Site-related disposal activities.

Groundwater Contamination

An extensive groundwater investigation was conducted to evaluate the nature and extent of contamination in both the Upper Glacial aquifer and the Magothy aquifer. Initially, a groundwater screening program was conducted to evaluate groundwater and to optimize locations for permanent monitoring wells to be installed in the Upper Glacial and Magothy aquifers. A total of 17 on-property (see **Figure 9**) and 34 off-property (see **Figure 10**) groundwater screening borings were completed, from which 38 screening samples and 113 screening samples, respectively, were collected for analyses of VOCs, cadmium, and chromium. Based on the groundwater screening results, 7 on-property and 31 off-property monitoring wells were installed to augment the existing monitoring well network, which consisted of 26 initial RI monitoring wells (11 on-property and 15 off-property). Therefore, there are currently 16 on-property monitoring wells completed in the Upper Glacial aquifer and 2 on-property monitoring wells completed in the Magothy aquifer (see **Figure 11**). In addition, there are currently 26 off-property monitoring wells completed in the Upper Glacial aquifer and 20 off-property monitoring wells completed in the Magothy aquifer (see **Figure 11**). In all, three rounds of new and existing monitoring well sampling were conducted. The first sampling round included 9 on-property wells and 29 off-property wells, the second sampling round included 10 on-property wells and 33 off-property wells (including the Farmingdale High School irrigation well), and the third sampling round included 1 on-property well and 14 off-property wells.

Sampling results indicate that two distinct plumes exist beneath the property. These plumes have been designated as Plume A and Plume B. Plume A originates on the western portion of the Liberty property, while Plume B apparently originates primarily upgradient of the Site, east of Plume A. Plume A is characterized by TCE concentrations (including degradation products such as cis-1,2-DCE) coming mainly from the former Building B Basement area and the former Wastewater Disposal Basins and extending south-southwest (generally west of Woodward Parkway). There is no significant PCE concentration in Plume A. Plume A is also characterized by chromium and cadmium contamination. Plume B is characterized by PCE concentrations (including degradation products) and extends across the Site toward the south-southwest (generally east of Woodward Parkway). PCE contamination was highest approximately 300 feet north of the Liberty property with a concentration of 1,100 micrograms/liter (μg/l) which indicates that the primary source of Plume B contamination is upgradient of the Liberty property. Unlike Plume A, Plume B is not characterized by chromium and cadmium contamination. Both Plumes A and B were delineated as relatively narrow in shape, which is typical of plumes in sandy aquifers similar to the Upper Glacial aquifer. The on-property and off-property extent of contamination in Plume A has been delineated while further investigation of Plume B and its source(s) is being conducted by EPA.

In Plume A, the cadmium and chromium contamination exists throughout the Upper Glacial aquifer under the Liberty property (maximum detected concentrations of 262 μg/l cadmium and 156 μg/l chromium) and to a lesser extent in the the upper portion of the Magothy aquifer (maximum detected concentration of 10 μg/l chromium - cadmium was not detected). The Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for cadmium and chromium are 5 μg/l and 50 μg/l, respectively. Inorganic contamination in the off-property groundwater is almost entirely limited to the Upper Glacial aquifer (maximum detected concentrations of 135 μg/l of cadmium and 553 μg/l of chromium); chromium was detected at a concentration of 63.5 μg/l in one sample collected from a monitoring well located near the intersection of Fallwood Parkway and Kent Street and screened in the upper portion of the Magothy aquifer. The inorganic contaminant plume appears to extend approximately a mile beyond the Site property just to the north of the Southern State Parkway.

Plume A sampling data for groundwater beneath the Liberty property indicated that VOC contamination is limited to the upper portion of the Upper Glacial aquifer (maximum detected concentrations of 1,500 μg/l of TCE, 810 μg/l of cis-1,2-DCE, and 2 μg/l of PCE); the MCL for TCE, cis-1,2-DCE and PCE is 5 μg/l. VOC sampling data for off-property groundwater revealed that Site-related VOC contamination is present throughout the Upper Glacial aquifer (maximum detected concentrations of 160 μg/l of TCE, 48 μg/l of cis-1,2-DCE, and 7 µg/l of PCE) and into the upper portion of the Magothy aquifer (maximum detected concentrations of 490 µg/l of TCE, 24 µg/l of cis-1,2-DCE, and 3 µg/l of PCE) between Fallwood Parkway and the Woodward Parkway Elementary School; samples collected from the upper portion of the Magothy aquifer downgradient of the school, however, did not exceed drinking water standards. The VOC contaminant plume within the Upper Glacial aquifer also appears to extend approximately a mile beyond the Site property just to the north of the Southern State Parkway.

The depth to the water table is approximately 21 feet bgs, although the Site groundwater table fluctuates between 15 feet bgs and 21 feet bgs. Based on six rounds of groundwater elevations (or depth-to-groundwater table measurements), groundwater flow within the Upper Glacial aquifer was determined to be predominantly horizontal and in the south-southwesterly direction; the horizontal flow velocity in the Upper Glacial aquifer was estimated to be about 1.6 feet/day. The direction of the horizontal component of groundwater flow within the Magothy aquifer is also in the south-southwesterly direction, with a slight south-southeasterly component north of the Farmingdale High School; the horizontal flow velocity in the Magothy aquifer was estimated to be about 0.17 feet/day.

A numerical groundwater fate and transport model, using the United States Geological Survey (USGS) MODFLOW/MT3D model, was also conducted to simulate groundwater flow and transport in the vicinity and downgradient of the Site. The model domain included the Farmingdale and Bethpage area to the north and the Massapequa and Wantagh regions to the south of the Site. In addition, the USGS MODPATH code was used to assess flow paths and travel times between the Site and areas of groundwater discharge. The model was calibrated against observed head data obtained during the supplemental RI activities and against well data contained in the Nassau County Department of Public Works database (e.g., observation wells, supply wells, pumping information). During the calibration process, the flow model input parameters (i.e., literature-based values for hydraulic conductivity, recharge, etc.) were adjusted to produce a model calibrated to average, observed groundwater elevation data. Sensitivity analyses for the main model parameters were performed. The time-versus-concentration plots for cadmium, chromium, and TCE for the 1940-2010 period, generated by the fate and transport model, show that the concentrations of these contaminants peaked during the 1950's and 1960's and have decreased or remained stable since that time.

Through a collaborative effort with the Massapequa and South Farmingdale Water Districts, six sentinel monitoring wells were installed upgradient of the water districts' drinking water supply well fields to serve as an early warning system should contamination migrate close to the well fields. The water districts' periodic monitoring of these sentinel wells has not detected any Site-related contamination.

Massapequa Creek and Preserve

The initial RI revealed that the Liberty groundwater contaminant plume within the Upper Glacial aquifer discharges into Massapequa Creek north of Pond A. The County storm sewer system, to which the on-Site storm drainage system is connected, also discharges into the headwaters of Massapequa Creek. **Figure 12** shows several detention ponds along the Massapequa Creek corridor. From north to south, these ponds are referred to as Pond A (north of the Southern State Parkway), Pond 1, Pond 2, Pond 3, Pond 4 (also referred to as Massapequa Reservoir and located south of Sunrise Highway), and Pond 5 (also referred to as Massapequa Lake, located north of Merrick Road and approximately 4.5 miles south of the Site). These ponds were constructed to control localized flooding and silting of the streambed. The conceptual model of Site contamination based upon the RI indicates that these ponds serve as detention basins for runoff and associated sediments entering the creek from the watershed. Pond A, being located farthest upstream and closest to the Liberty Site, therefore has the greatest potential to be affected by contaminated groundwater discharge from the Liberty Site. This information indicated the need to expand the limited investigation of the Massapequa Creek that was initially conducted during the initial RI.

The objective of the supplemental RI was to further define the extent of groundwater discharge, and to evaluate potential ecological effects in an ecological risk assessment. The supplemental RI included the following activities:

- surface water sampling,
- stream and pond sediment sampling,
- sediment toxicity (bioassay) testing,
- fish sampling, and
- benthic macroinvertebrate surveys.

Figure 12 shows the ecological sampling locations in the Massapequa Creek and ponds that were investigated. Mill Pond, located in Bellmore approximately four miles west of the Massapequa Preserve, was utilized as a reference pond with which to compare results of the supplemental RI. Analytical results from the supplemental RI were screened in order to determine potential ecological risks from groundwater requiring further evaluation in the risk assessment. Exceeding screening benchmarks does not necessarily indicate the need for cleanup, or even the presence of actual risks, but indicate the need for further Site-specific evaluation of potential ecological risks in order to form the basis of informed risk management decisions. Results of the supplemental RI indicated that several chemicals present in groundwater discharging from the Site were also present in surface water and sediment at levels exceeding ecologically-based screening benchmarks. The highest frequency and magnitude of these values were noted in Pond A.

Surface Water Sampling

Surface water samples were collected from 13 locations within the Massapequa Creek system and analyzed for VOCs and cadmium, chromium and lead. The samples were collected between the eastern branch headwaters of Massapequa Creek and just south of Pond 2. Results indicated only trace concentrations of VOCs in the surface water samples, none above the NYSDEC chronic ambient water quality standards (AWQS). The major VOC constituent detected was methyl-tertiary butyl ether (MTBE), a common anti-knock gasoline additive, which is non-Site-related and was likely introduced into the Massapequa Creek by stormwater runoff from the adjacent highways and urban development. TCE in excess of 1 μg/l was only detected north of Pond A. Cadmium was detected above the NYSDEC chronic AWQS between Pond A and Pond 1 and above the NYSDEC acute AWQS upstream of Pond A; cadmium concentrations to the south of Pond 1 were either nondectable or below the AWQS. Total chromium concentrations were below the NYSDEC AWQS throughout the study area. Hexavalent chromium concentrations exceeded the AWQC only north of Pond A. These results are compatible with overall characteristics of shallow groundwater discharge into the Massapequa Creek.

Stream and Pond Sediment Sampling

Five rounds of stream sediment and pond sediment sampling were conducted, though not all locations were sampled in each round.

During the first round, 15 stream or pond sediment samples were collected from locations within the Massapequa Creek and ponds, between the headwaters of the Massapequa Creek and just south of Pond 2. During the second round, 11 pond sediment samples were collected from two locations in Pond A, three locations in and near Pond 1, three locations in Pond 2, and three locations in Pond 3. During the third round, 14 pond sediment samples were collected from one location from Pond A, one location from Pond 1, one location from Pond 2, two locations from Pond 3, three locations from Pond 4 (Massapequa Reservoir), and three locations from Pond 5 (Massapequa Lake), and one location from reference pond (Mill Pond). During the fourth round, 8 sediment samples were collected from Pond A, Pond 1, Pond 2, Pond 3 (two locations), Pond 4, Pond 5, and Mill Pond. During the fifth round, 11 pond sediment samples were collected from Pond A.

Sediment samples collected during rounds 1 and 2 were analyzed for VOCs and metals. Samples collected during rounds 3, 4, and 5 were analyzed for metals only, in particular, cadmium, chromium and lead. Only trace concentrations of the Site-related VOCs, TCE (0.6 to 1.0 μg/kg) and 1,1,1-TCA (0.5 to 2.2 microgram/kilogram (μg/kg)), which is a degradation product of TCE, were detected. Metal concentrations in stream sediments were lower (by about two orders of magnitude) than the metals concentrations in pond sediments. The metals data were compared to NYSDEC guidance values used to screen contaminated sediments for possible adverse ecological impacts. Cadmium concentrations which exceeded the NYSDEC Severe Effect Level (SEL) sediment screening guideline (9 mg/kg) in all ponds except the reference pond (Mill Pond), were highest in Pond A and Pond 1. Chromium concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; chromium concentrations were highest in Pond A, Pond 1, and Pond 4. Lead concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; lead concentrations were highest in Pond A, Pond 1, and Pond 5. Lead is considered non-Site-related as it is believed to have been introduced into the Massapequa Creek via urban runoff.

As the NYSDEC SELs are generic guidance criteria, they suggest the possibility for adverse ecological impacts. In such situations, Site-specific information (e.g., sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses) is usually relied upon to provide additional information regarding the potential for ecological effects to result from exposure to contamination present in the system.

Sediment Toxicity (Bioassay) Testing

Sediment toxicity testing was performed to evaluate whether the metals concentrations in sediments have any effect on the survival of acclimated test organisms. Two rounds of sediment toxicity tests were conducted; the first round was conducted on sediments from all six Massapequa Creek ponds and the second round was conducted on sediments from only Pond A where the highest cadmium, chromium, and lead concentrations of 248 mg/kg, 839 mg/kg, and 1,160 mg/kg, respectively, were detected. The sediment toxicity tests were conducted on two standard benthic invertebrate test organisms (*Hyalella azteca and Chironomus tentans*) by exposing them to Site sediments. Pond sediments with cadmium concentrations of at least 99.9 ppm and chromium concentrations of at least 457 ppm caused a significant reduction in survival of *Hyalella azteca* and a significant reduction in growth of *Chironomus tentans* compared to the control sediments.

Fish Sampling

Fish tissue sampling was performed to determine metals concentrations in fish tissue, or bioaccumulation, for use in the human and ecological risk assessments. Fish samples (carp and sportfish) were collected from five ponds (Pond A and Pond 2 through Pond 5) and the reference location. Both carcass and fillet analyses were performed for lead, chromium, and cadmium. Fish tissue analytical data indicate that the concentrations of chromium, cadmium, and lead were higher in fish collected from Pond A compared to the downstream ponds. This difference was most pronounced for lead in carp, as might be expected considering the niche of these species. The carp is a bottom feeder with a limited forage range, while sportfish (e.g., bluegill and pumpkinseed) are more mobile and tend to feed in the water column. In Pond A, the decreasing order of relative concentration above the reference sample was lead, chromium and cadmium. In Pond A whole fish sample for carp, lead, chromium, and cadmium were detected at 6.8 mg/kg, 4.0 mg/kg, and 1.0 mg/kg, respectively. For comparison, in reference Mill Pond whole fish sample for carp, lead, chromium, and cadmium were detected at 1.0 mg/kg, 0.42 mg/kg, and 0.025 mg/kg, respectively.

Benthic Macroinvertebrate Surveys

The objective of the benthic macroinvertebrate survey was to evaluate the abundance and diversity of the macroinvertebrate community in the ponds along Massapequa Creek. The composition of this community can be a useful indicator for the degree of overall impacts to the ecological habitat. Twelve sediment samples for macroinvertebrate analyses were collected from ponds along Massapequa Creek. Results from the macroinvertebrate study indicate that the benthic macroinvertebrate populations at all locations, including the reference location, were impoverished, of low diversity, and consisted largely of bloodworms, a few midges, and leaches. This is attributed to the introduction of contaminants into the locations from urban runoff. However, Pond A was found to have the lowest diversity and the least evenness of all ponds. The Mill Pond reference location also had very low number of total specimens, richness, diversity and evenness.

Additional details on the Site-specific sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses as to their risk implications are described under “Summary of Site Risks” below.

SUMMARY OF SITE RISKS

A Human Health Risk Assessment Update (HHRA) (and HHRA Addendum) and Ecological Risk Assessment Update (ERA) were conducted to estimate the human and ecological risks associated with current and future Site conditions. A baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the Site, if no remedial action were taken. As described above, during the comment period, EPA became aware, after the HHRA had already been prepared, that the Town of Oyster Bay had taken significant steps towards formalizing plans to acquire nearly all of the western portion of the Site for recreational development. The Town advised EPA that its planned recreational uses might include, among other uses, walking/nature trail and sensory gardens, a picnic area, cabins, and campgrounds for Boy Scout outings. Based on this information, EPA re-evaluated in the HHRA Addendum potential cancer risks and noncancer hazards associated with these potential future uses of the western portion of the Site.

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 adverse effects (response). Risk Characterization--summarizes and combines results of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks.

Current Federal guidelines for acceptable exposures are an individual lifetime excess carcinogenic risk to a reasonably maximally exposed individual in the range of 10-4 to 10-6 (e.g., a one-in-ten-thousand to a one-in-a-million excess cancer risk or likelihood of an additional incidence of cancer) and a Hazard Index (HI) (which reflects noncarcinogenic effects for a human receptor) equal to 1.0. An HI greater than 1.0 indicates a potential for noncarcinogenic health effects.

For purposes of the HHRA, the following potential exposure areas were considered: western portion of the Site, eastern portion of the Site, off-property residential areas (includes Ellsworth Allen Park and Woodward Parkway School), and the Massapequa Preserve.

<u>Hazard Identification</u>

During data evaluation, relevant Site information is compiled and analyzed, in order to select contaminants of concern (COCs). For the Liberty site, several inorganic chemicals and organic compounds meeting appropriate QA/QC requirements were selected as COCs because of the potential hazard they pose to human health and the environment. Selection of COCs that would be representative of Site risks for specific environmental media was made for the following potential exposure areas:

- western portion of the property (surface soil, surface/subsurface soil, on-property Upper Glacial groundwater, and on-property Magothy groundwater),
- eastern portion of the property (solid waste, aqueous waste, and surface/subsurface soil),
- off-property residential areas (subsurface soil, off-property Upper Glacial groundwater and off-property Magothy groundwater), and

- Massapequa Preserve (surface water, sediment, and fish tissue).

The most frequently selected COCs include cadmium, chromium, and TCE. **Table 2** summarizes the COCs and medium-specific exposure point concentrations for the COCs detected in various media within the aforementioned four potential exposure areas.

Exposure Assessment

Exposure point concentrations were calculated from sample data sets (e.g., soil and sediment) to represent the reasonable maximum exposure (RME) to various current and hypothetical future individuals on and around the Liberty site. **Table 3** provides a limited conceptual Site model of potential exposures for the Liberty site. This table focuses on those exposure pathways associated with unacceptable levels of risk. A complete conceptual Site model can be found in Table 1 of the HHRA. Based on current and future land uses, groundwater uses and surface water uses, the HHRA evaluated potential health effects for the following exposure pathways for current and/or future Site use scenarios for each of the four potential exposure areas.

- Western Portion of the Property

  Current Trespassers - ingestion of, dermal contact with, and inhalation of surface soil; inhalation of surface/subsurface soil; and inhalation of vapors from Upper Glacial groundwater by a trespasser.

  Future Commercial/Industrial Workers - ingestion of, dermal contact with, and inhalation of surface /subsurface soil; inhalation of vapors from Upper Glacial groundwater; inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater.

  Future Construction Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; inhalation of vapors from Upper Glacial groundwater; inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater.

  Future Recreational Users - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; inhalation of vapors from Upper Glacial groundwater;

inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater (ingestion of, and dermal contact with, soils were re-evaluated in the HHRA Addendum).

- Eastern Portion of the Property

  Current Trespassers - inhalation of solid waste and aqueous waste.

  Current Commercial/Industrial Workers - inhalation of solid waste.

  Future Commercial/Industrial Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; and inhalation of solid waste and aqueous waste.

  Future Construction Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; ingestion of, dermal contact with, and inhalation of solid waste; and dermal contact with and inhalation of aqueous waste.

- Off-property Residential Areas

  Current Off-property Residents - inhalation of Upper Glacial groundwater.

  Current Off-property School Children - inhalation of Upper Glacial groundwater.

  Current Off-property School Employees - inhalation of Upper Glacial groundwater.

  Future Off-property Residents - ingestion of, dermal contact with, and inhalation of Magothy groundwater.

  Future Off-property Recreational Users - ingestion and inhalation of Upper Glacial groundwater; and ingestion of, dermal contact with, and inhalation of subsurface soils.

- Massapequa Preserve

Current Swimmers - ingestion of and dermal contact with surface water; and ingestion of and dermal contact with sediment.

Current Fishers - ingestion of fish tissue.

Many of the sample locations were biased, i.e., they were selected due to the presence of elevated levels of contaminants. Therefore, the values calculated on those data sets are a conservative estimate of the RME. In addition to the calculation of exposure point concentrations (**Table 2**), several Site-specific assumptions regarding future land-use scenarios and exposure pathways, e.g., inhalation, ingestion, and dermal contact, were made. Assumptions were based on Site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of Site-specific data.

Toxicity Assessment

Standard dose conversion factors, oral and inhalation reference doses, and oral and inhalation cancer slope factors were used to estimate the noncarcinogenic and carcinogenic hazards associated with Site contaminants. **Tables 4 and 5** provide the cancer and noncancer toxicity data, respectively, for the COCs based on information in the Integrated Risk Information System (IRIS), the 1997 Health Effects Assessment Summary Tables, and EPA's National Center for Environmental Assessment Superfund Technical Support Team. The risk estimators used in this assessment are accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various COCs.

At this time, cancer slope factors and Reference Doses are not available for the dermal route of exposure. Thus, the dermal slope factors used in the assessment have been extrapolated from oral values using appropriate adjustment factors based on data on the chemical's absorption. Adjustments in the oral cancer slope factors and Reference Doses are listed in Tables 5 and 6 of the July 2000 Final Baseline Human Health Risk Assessment report.

A number of chemicals lack adequate toxicity information to quantify the potential risks and hazards associated with exposure. A list of the chemicals not quantitatively evaluated are also provided in the July 2000 Final Baseline Human Health Risk Assessment report. Lack of data to quantify risks and hazards for these chemicals may potentially underestimate the risks and hazards at the Site.

Risk Characterization

The Risk Characterization summarizes the risks and hazards for chemical contaminants through various routes of exposure.

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk = CDI x SF

where:	risk =	a unitless probability (e.g., 2×10^{-5}) of an individual's developing cancer
	CDI =	chronic daily intake averaged over 70 years (mg/kg-day)
	SF =	slope factor, expressed as $(mg/kg\text{-}day)^{-1}$.

These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of Site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for Site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ<1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI<1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI > 1 indicates that Site-related exposures may present a risk to human health.

The HQ is calculated as follows:

Noncancer HQ = CDI/RfD

where: CDI = Chronic daily intake
RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

The risks presented in **Tables 6 and 7** summarize the cancer risks from exposure to those chemicals with risks greater than 1 in 1,000,000 and the noncancer hazards from exposure to those chemicals with Hazard Index greater than 1, respectively.

For the western portion, in the HHRA, the only receptor whose noncarcinogenic hazard exceeds EPA’s benchmark value of an HI of 1 is the commercial/industrial worker, exposed to contaminants in the Upper Glacial groundwater and evaluated under a future use scenario, with an HI of 8.9. This exposure currently does not occur, since groundwater is not used as a drinking water source at the Site. The primary contributors to this HI are cadmium (HQ of 7.5) and chromium (HQ of 1.4). None of the cancer risks estimated for the western portion exceed EPA’s target risk range. As discussed below (see Human Health Risk Assessment Addendum - Western Parcel), the HHRA Addendum determined that there is an unacceptable noncancer risk to certain recreational users.

For the eastern portion, the receptor whose cumulative risk exceeds one-in-a-million excess cancer risk is the future construction worker (1×10^{-3}), which is greater than the upper boundary of the acceptable cancer risk range. For the future construction worker, the primary contributing medium and route is dermal exposure to aqueous waste, with benzo(a)pyrene and dibenzo(a,h)anthracene as the primary contributors to the cumulative risk. Dermal protection during handling of aqueous wastes would significantly reduce potential exposure and risks for this receptor. The only receptor whose cumulative hazard index exceeds 1.0 is the future construction worker (31). The primary contributor to the hazard index is dermal exposure to aqueous wastes, with chromium (HQ of 1.5) and a PCB (Aroclor 1260 with an HQ of 31) being the primary contaminants of concern.

For the off-property residential areas, the receptors whose cumulative cancer risks exceed EPA's target cancer risk are current and future off-property residents. The current off-property resident's cumulative cancer risk from exposure to the Upper Glacial groundwater is 1.9×10^{-3}, which is driven by vinyl chloride and 1,1-DCE (two degradation products of TCE). The evaluation of noncarcinogenic effects shows that the hazards to the off-Site child resident are 95 (HI values for cadmium of 35, for chromium of 8.7, and for manganese of 50), and the off-Site adult resident are 26 (HI values of 8.4 for cadmium, 6.1 for chromium, and 11 for manganese). Under a future use scenario, the risks to the child and adult residents from exposure to the Magothy groundwater are 4.5×10^{-4}, with vinyl chloride and 1,1-DCE as the most significant contributors to the risk. The noncarcinogenic hazards to the off-Site residents using the Magothy groundwater are 6.8 for the child resident, with chromium (HQ of 1.7) and manganese (HQ of 3.2) as the primary chemicals of concern. The HI for the adult resident is less than EPA's acceptable level. It is noted, however, that these scenarios are hypothetical as the groundwater in the vicinity of the Site is not used for public drinking water supply.

For the Massapequa Preserve, all carcinogenic risks estimated for surface water, sediment, and fish tissue are within EPA's acceptable risk range for all populations. Noncarcinogenic HI values for surface water and fish tissue for all populations and for adults exposed to sediment are less than EPA's benchmark of an HI value of 1. The HI value for children exposed to sediment slightly exceeds the benchmark (HI of 1.1), although no HQ values for an individual chemical exceeds 1.

Finally, several locations were identified as potential areas of concern for chromium. Dermal exposure to chromium may result in allergic responses in certain sensitive individuals, which is called "contact dermatitis." The areas of concern are the western portion surface samples in the northwest disposal area and the southern portion of the disposal basins; the western portion subsurface soil in and near the disposal basins, northwest disposal area and the ramp excavation pile on the Building N foundation (or former Building B Ramp Pile); and the eastern portion subsurface soil in the Building B basement. Potential effects from exposure to chromium in these areas can be managed and reduced by following the appropriate measures as outlined in the health and safety plan, including wearing gloves and other personal protection equipment and limiting exposure to the contaminated materials.

Human Health Risk Assessment Addendum - Western Parcel

In the HHRA Addendum, a four-step process similar to that of the HHRA was utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization. The HHRA Addendum re-evaluated potential cancer risks and noncancer hazards associated with the Town of Oyster Bay's planned future recreational uses of the western portion of the Site, as described above, for the following receptors: adults (over the age of 18 years), adolescents (age of 6 - 18 years), and children (under the age of 6 years).

For an adult recreational user, the cancer risk is within the acceptable range of 10^{-6} to 10^{-4}, while the noncancer risk, from exposure via incidental ingestion and dermal contact, is within EPA's acceptable level of an HI of less than or equal to 1.

For an adolescent recreational user, the cancer risk is within the acceptable range. The noncancer risk slightly exceeds the acceptable level of an HI of 1. When this occurs, the next level of evaluation requires that the HI for each target organ should be calculated to see if the HI for any target organ exceeds the acceptable level. The HI for each target organ is below the benchmark value of 1. This indicates that adverse health effects are not expected for the adolescent as a result of possible exposure to Site-related contaminants.

For a child recreational user, the cancer risk is within the acceptable range. However, the noncancer risk exceeds the benchmark value of 1 (HI of 8.6). The significant contributors to this value are cadmium (HQ of 4.0) and hexavalent chromium (HQ of 1.4). These hazard quotients indicate the potential for noncancer health effects if no remediation occurs. Additional details are provided in an EPA document entitled, "March 25, 2002 Liberty Industrial Finishing Site Human Health Risk Assessment Addendum - Western Parcel," which is provided in **APPENDIX I** to this ROD.

Ecological Risk Assessment

The purpose of the Ecological Risk Assessment Update (ERA), which was conducted as part of the supplemental RI, was to identify and estimate the potential ecological impacts associated with the exposure of fish and wildlife to Site-related contamination within the Massapequa Preserve. Specifically, the ERA focused on the potential impacts of the COCs found in sediments and surface waters of the Massapequa Preserve, downstream of the zone of influence of a groundwater plume that originates at the Site, to terrestrial and aquatic ecological receptors.

A four-step process is utilized for assessing Site-related ecological risks for a reasonable maximum exposure scenario:

- *Problem Formulation* - 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.

Surface water and sediment of the Massapequa Preserve were analyzed for both inorganic and organic chemicals, and fish tissues were analyzed for cadmium, chromium, and lead. The COCs were identified by comparing contaminant concentrations in surface water and sediment with the ecologically-based screening benchmarks. Detection of cadmium, chromium, and lead (which is believed to have been introduced into the Massapequa Creek via urban runoff) in most of the Massapequa Creek Pond sediment samples at concentrations above their respective NYSDEC SELs suggested the possibility of adverse effects. Therefore, as explained above, sediment toxicity testing (bioassays) and fish tissue analyses were conducted to further assess the potential effects.

Sediment toxicity testing was performed to evaluate whether the metals concentrations in sediments have any effect on the survival of acclimated test organisms. These tests are bioassays conducted in a laboratory where certain organisms are exposed to contaminated sediment samples and monitored. Two rounds of sediment toxicity tests were conducted; the first round was conducted on sediments from all six Massapequa Creek ponds and the second round was conducted on sediments from only Pond A where the highest cadmium, chromium, and lead concentrations of 248 mg/kg, 839 mg/kg, and 1,160 mg/kg, respectively, were detected. The sediment toxicity tests were conducted on two standard benthic invertebrate test organisms (*Hyalella azteca* and *Chironomus tentans*) by exposing them to Site sediments. The bioassay results indicated toxicity to the test organisms from exposure to the sediment samples from Pond A. Pond sediments with cadmium concentrations of at least 99.9 ppm and chromium concentrations of at least 457 ppm caused a significant reduction in survival of *Hyalella azteca* and a significant reduction in growth of *Chironomus tentans* compared to the control sediments.

Fish tissue sampling was performed to determine metals concentrations in fish tissue for use in the human and ecological risk assessments. Fish samples were collected from five pond locations in Massapequa Preserve (Pond A and Pond 2 through Pond 5) and from the reference location. Both carcass and fillet analyses were performed for lead, chromium, and cadmium. Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk in Pond A. The highest body burdens of chromium and lead were reported in fish collected from Pond A. Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk from the contaminated sediments in Pond A. The highest concentrations of cadmium were found in fish from Pond A and Pond 5. The highest concentrations of chromium and lead were found in fish from Pond A. In Pond A, the whole fish sample for carp contained lead, chromium, and cadmium at 6.8 mg/kg, 4.0 mg/kg, and 1.0 mg/kg, respectively.

The objective of the benthic macroinvertebrate survey was to evaluate the abundance and diversity of the macroinvertebrate community in the ponds along Massapequa Creek. Twelve sediment samples for macroinvertebrate analyses were collected from ponds along Massapequa Creek. As explained above, results from the macroinvertebrate study indicate that the benthic macroinvertebrate populations at all locations, including the reference location, were impoverished, of low diversity, and consisted largely of bloodworms, a few midges, and leaches. This is attributed to the introduction of contaminants into the locations from urban runoff. Pond A was found to have the lowest diversity and the least evenness. However, the Mill Pond reference location also had very low number of total specimens, richness, diversity and evenness.

Based on the weight-of-evidence from the cumulative Massapequa Creek investigatory results as described above, it was concluded that Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish.

Discussion of Uncertainties in Risk Assessment

The procedure 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; and,
- toxicological data.

Uncertainty in environmental sampling arises, in part, from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant 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 contaminants of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants 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 baseline human health risk assessment provides upper-bound estimates of the risks to populations near the Site, and it is highly unlikely to underestimate actual risks related to the Site.

Specifically, several aspects of risk estimation contribute uncertainty to the projected risks. EPA recommends that the arithmetic average concentration of the data be used for evaluating long-term exposure and that, because of the uncertainty associated with estimating the true average concentration at a Site, the 95% upper confidence limit (UCL) on the arithmetic average be used as the exposure point concentration. The 95% UCL provides reasonable confidence that the true average will not be underestimated. Exposure point concentrations were calculated from soil sample data sets to represent the reasonable maximum exposure (RME) to various current and hypothetical future populations on and around the Liberty site property. Many of the soil and sediment sample locations were biased, i.e., they were selected due to the presence of elevated levels of contamination. Therefore, the UCL values calculated on those data sets are a conservative estimate of the RME. In fact, the true UCL values on the actual distributions of chemicals of concern in soil are less than the values calculated from the analytical data. Uncertainty associated with sample laboratory analysis and data evaluation is considered low as a result of a rigorous quality assurance program which included data validation of each sample result.

In addition to the calculation of exposure point concentrations, several Site-specific assumptions regarding future land use scenarios, intake parameters, and exposure pathways are a part of the exposure assessment stage of a baseline risk assessment. Assumptions were based on Site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of Site-specific data. However, there remains some uncertainty in the prediction of future use scenarios and their associated intake parameters and exposure pathways. The exposure pathways selected for current scenarios were based on the Site conceptual model and related supplemental RI data. The uncertainty associated with the selected pathways for these scenarios is low because Site conditions support the conceptual model.

Standard dose conversion factors, risk slope factors, and reference doses are used to estimate the carcinogenic and noncarcinogenic hazards associated with Site contaminants. The risk estimators used in this assessment are generally accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various chemicals of potential concern.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the July 2000 Final Baseline Human Health Risk Assessment report.

Based on the results of the supplemental RI/FS and the baseline risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected remedy, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) 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), NYSDEC's recommended soil cleanup objectives, Site-specific risk-based levels, and the most reasonably anticipated future land use for the Site, i.e., commercial/industrial for the eastern portion and commercial/industrial or recreational for the western portion. The RAOs which were developed for soil, sediment, and groundwater are designed, in part, to mitigate the health threat posed by ingestion, dermal contact, or inhalation of vapors and particulates where these soils are contacted or disturbed or where groundwater may be contacted. The RAOs are also intended to mitigate the health threat posed by the ingestion of groundwater and are designed to prevent further leaching of contaminants from the soil to the groundwater.

The following remedial action objectives were established for the Site:

On-Site Soils

- Prevent the direct exposure of receptors to Site-related contaminants through inhalation, direct contact or ingestion, or mitigate soil contaminant concentrations to a level that will not pose unacceptable risks to human health and the environment,

- Reduce the concentration or mobility of soil contaminants to a level which will prevent further degradation of groundwater.

- Remove all RCRA hazardous waste from the Site.

- Remove any structural impediments that might interfere with pre-design sampling and implementation of soil, subsurface feature, and groundwater remediation.

On-Site Subsurface Features (on Eastern Portion of the Site) and Underground Storage Tanks

- removal of contaminated aqueous and/or solid materials from subsurface features and underground storage tanks.

On-Site and Off-Site Groundwater

- Prevent or minimize ingestion, dermal contact and inhalation of inorganic- and organic-contaminated groundwater that are above State and Federal maximum contaminant levels (MCLs).

- Restore groundwater quality to levels which meet State and Federal MCLs.

Massapequa Creek Pond A Sediments

- prevent adverse effects to ecological receptors within the Massapequa Creek and associated ponds caused by exposure to Site-related contaminants.

In order to meet these objectives, preliminary remedial goals, or PRGs, were developed during the supplemental FS for various contaminants of concern. In developing the final soil cleanup numbers presented below, consideration was given to risks posed by the contaminants under reasonably anticipated future uses of the Site, protection of the underlying sole-source aquifer, and the NYSDEC TAGMs.

Based on the information provided in the supplemental RI report and the HHRA, soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium were developed for the Site. The NYSDEC’s soil cleanup objectives, as specified in the TAGM, were adopted as the soil cleanup levels for TCE, cis-1,2-DCE, and PCE, respectively: 0.7 mg/kg, 0.25 mg/kg, and 1.4 mg/kg. These soil cleanup levels represent allowable concentrations in soils that would be protective of human health under future commercial/industrial or recreational uses of the Site. These soil cleanup levels would also maintain the drinking-water quality of the underlying groundwater aquifers. Due to the spatial and vertical location of contaminants of concern, EPA believes that if the contaminated soils are remediated to the cadmium and chromium cleanup levels, then the VOC contaminants in soils will also be adequately addressed.

For the purpose of determining whether the subsurface features and the underground storage tanks have been adequately remediated, the following PRGs will be used: 10 mg/kg cadmium; 143 mg/kg chromium; 0.7 mg/kg TCE; 0.25 mg/kg cis-1,2-DCE; 1.4 mg/kg PCE; 1 mg/kg PCBs for soils between zero and 1 foot bgs and 10 mg/kg PCBs for soils below 1 foot bgs; 35 mg/kg cyanide; 0.29 mg/kg benzo[a]pyrene; and 0.29 mg/kg dibenzo[a,h]anthracene. (The PRGs, 10 mg/kg PCBs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, and 0.29 mg/kg dibenzo[a,h]anthracene, are preliminary remediation goals for commercial-industrial risk-based screening concentrations and were developed by EPA Region IX.)

Groundwater cleanup levels for cadmium, chromium, TCE, cis-1, 2-DCE, and PCE are State and Federal MCLs, i.e., cadmium = 5 µg/l, chromium = 50 µg/l, TCE = 5 µg/l, cis-1,2-DCE = 5 µg/l, and PCE = 5 µg/l. Due to the distribution of contaminants that were detected in the groundwater, EPA believes that if the contaminated on-Site and off-Site groundwater is remediated to these State and Federal drinking water standards, then all other inorganic and organic contaminants in the groundwater will also be adequately addressed.

Sediment cleanup levels of 50 mg/kg cadmium and 260 mg/kg chromium were developed for remediation of Pond A sediments.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action 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, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a Site. CERCLA §121(d), 42 U.S.C. §9621(d), further mandates that a remedial action attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under Federal and State laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Based on the information contained in the supplemental RI/FS reports and the HHRA and the ERA, the Proposed Plan evaluates, in detail, three remedial alternatives for Site soil contamination, three remedial alternatives for groundwater contamination, and two remedial alternatives for sediment contamination within Pond A. The soil, groundwater, and sediment alternatives for the Site are presented below. Institutional controls in the form of deed restrictions are also required for all soil and groundwater remedial alternatives.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with the PRPs, design the remedial action or procure contracts for design and construction.

The alternatives discussed below may vary in title and description from those identified in the FS report. In addition, in conformance with its July 2000 guidance document entitled, “Guide to Developing and Documenting Cost Estimates During the Feasibility Study,” EPA recalculated the costs of the FS remedial alternatives utilizing a discount rate of 7%, assumed a 20-year time frame (except for a 50-year time frame for cap maintenance under Alternative SL-2), and included a category encompassing periodic costs which might be incurred during the long-term operation and maintenance of each alternative.

The remedial alternatives are:

Soil Remedial Alternatives

The cleanup levels for Site soils presented under the discussion entitled, “Remedial Action Objectives,” above, would require remediation of approximately 73,100 cubic yards of soil. The bulk of the contamination, including 16,000 cubic yards of soils that are hazardous wastes under RCRA, is located in four discrete areas: the Former Wastewater Disposal Basins (11,400 cubic yards), the Northwest Disposal Area (32,000 cubic yards), the Building B Basement (3,500 cubic yards), and the former Building B Ramp Pile (500 cubic yards), with the remaining 25,700 cubic yards of low-level contaminated soils scattered and present throughout abutting seven acres of soils.

Of particular concern at the Liberty site is contamination in the subsurface soil that may come in contact with the groundwater. Unlike conditions at other sites where subsurface contamination is subject to leaching primarily from infiltrating precipitation, at the Liberty site, there exists a significant volume of contaminated soils that are in contact with the groundwater, as the groundwater table can fluctuate from 15 to 21 feet bgs. In addition to the three soil remedial alternatives described below, two other alternatives were considered in the supplemental FS report but were not carried through the detailed comparative analysis in the Proposed Plan.

One alternative involving the contaminated soils at depth of 15 to 21 feet included excavating the contaminated soils and replacing this material with clean fill, redepositing the excavated soils above the clean fill and installing a cap. This alternative was eliminated from the detailed consideration in the Proposed Plan because it would not comply with New York Environmental Conservation Law §27-0704 (Long Island Landfill Law) which is an applicable or relevant and appropriate requirement (ARAR) for the Site. This law prohibits the creation of new landfills on Long Island in an effort to protect the sole source aquifer which is the primary source of drinking water for Long Island residents.

Another alternative involved excavation and stabilization of contaminated soils and redeposition of the stabilized material on the Site property. This alternative was also eliminated from detailed consideration in the Proposed Plan because it also would not comply with the Long Island Landfill Law. In addition, this alternative would require time to perform treatability studies remedial design and the actual treatment of inorganically- and organically-contaminated soils; it would be technically difficult to stabilize some soils given the nature of the highest levels of contamination found at the Site; and it would likely not be widely accepted by the public.

Alternative SL-1: No Action

Capital Cost:	N/A
Total Operation and Maintenance Cost:	N/A
Present Worth Cost:	N/A
Construction Time:	N/A

The Superfund program requires that the “no-action” alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the soil contamination at the Site.

Because this alternative would result in contaminants remaining on Site, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative SL-2: Excavation and Off-Site Disposal of Contaminated Soils Near the Water Table and Capping of Other Contaminated Soils

Capital Cost:	$7,863,000
Total Operation and Maintenance (O&M) Cost:	$1,077,000
Present Worth Cost*:	$8,940,000
Construction Time:	1 year

* The present worth costs for Alternative SL-2 are calculated using a discount rate of 7 percent, a 50-year time interval, and annual, as well as periodic, O&M expenses.

Alternative SL-2 would involve the excavation and off-Site disposal of approximately 25,600 cubic yards of contaminated soils at depths of approximately 15 to 21 feet bgs and corresponding overlying soils (above 15 feet bgs) that exceed cadmium and chromium cleanup levels, as well as other Site soils, which would be characterized as RCRA hazardous waste. The excavation, which would need to be conducted when the water table is low, would occur primarily in the area of the Former Wastewater Disposal Basins. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Soils that were not contaminated above Site-specific cleanup levels would be left at the Site. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the Site to the original grade. For cost-estimating purposes, it is assumed that 16,000 cubic yards of the excavated soils would be sent to a RCRA Subtitle C facility.

This alternative would also include capping the remaining areas of the Site (approximately 8.75 acres in total) where concentrations exceed cadmium and chromium cleanup levels. The cap would be either an asphalt cover system or engineered structure, such as a building. If asphalt were used, it would be designed and constructed to include a 5-inch thick bituminous stabilized base overlain by a geotextile fabric and a 2-inch bituminous concrete wearing course with a permeability on the order of 5×10^{-8} cm/sec. The geotextile fabric would prevent surface cracks from spreading, reduce the potential for infiltration through cracks that may occur between maintenance activities, and further reduce the overall permeability of the asphalt cover system. **Figure 13** shows a conceptual diagram of the work to be performed under Alternative

SL-2. As part of the engineering evaluation and design for Alternative SL-2, various cover system designs would be tested to ensure that the objective of reducing surface permeability to 5 x 10^{-8} cm/sec can be achieved. Because the cap is susceptible to weathering and cracking, a maintenance and inspection program would be required to ensure the long-term integrity of the cap. The maintenance and inspection program will consist of visual inspections of the asphalt cap, performed on a quarterly basis. In addition, a comprehensive groundwater monitoring program would be implemented to evaluate the effectiveness of the cap system.

In addition, contaminated USTs and other subsurface features would be remediated through the removal of the aqueous and/or solid materials from the USTs and the subsurface features, via application of readily available technologies (such as liquid and sludge removal by vacuum suction). Related to the UST/features investigation and remediation, sampling and analysis at the northern and eastern sanitary leaching fields would be performed and contaminated soils, sediments, sludges, liquids and/or other forms of Waste associated therewith would be removed and disposed of off Site. As discussed above, under **"SUMMARY OF SITE CHARACTERISTICS"** ("Subsurface Feature Inspection" and "Sampling and Underground Storage Tank UST Investigation"), a portion of the UST/subsurface feature and sanitary leaching field activities which are described in this paragraph and a portion of the activities relating to remediation of the Former Building B Ramp Pile, are the subject of an administrative order on consent previously issued by EPA. These activities are included in the selected soil alternatives subject to satisfactory completion pursuant to that administrative order.

This alternative would leave contaminants at the Site and would not allow for unrestricted land use. Therefore, institutional controls (e.g., deed restrictions to limit the future use of the Site to recreational (western portion only) or commercial/industrial uses) to limit demolition or construction at the Site until the subsurface features have been remediated; and a prohibition on Site activities that would damage the cap. In addition, because this alternative would result in soil contamination remaining at the Site, CERCLA would require that the Site be reviewed at least once every five years to ensure that it remains protective of human health and the environment.

Alternative SL-3: Excavation and Off-Site Disposal of All Contaminated Soils

Capital Cost:	$12,862,000
Total Operation and Maintenance Cost:	$ 230,000
Present Worth Cost*:	$13,092,000
Construction Time:	1 ½ years

* The present worth costs for Alternative SL-3 and for groundwater alternatives and sediment alternatives, discussed below, are calculated using a discount rate of 7 percent, a 20-year time interval, and annual, as well as periodic, O&M expenses.

Alternative SL-3 would involve excavation and off-Site disposal of approximately 73,100 cubic yards of contaminated soils that exceed cadmium and chromium cleanup levels. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the Site to the original grade. **Figure 14** shows a conceptual diagram of the work to be performed under Alternative SL-3. The USTs/subsurface features/northern and eastern sanitary leaching fields investigation and remediation provisions described under Alternative SL-2 would also pertain to Alternative SL-3. Also, the institutional controls described under Alternative SL-2 would apply to Alternative SL-3 except that there would be no need for the control relating to the prohibition of activities that might damage the integrity of the cap.

Under this alternative, CERCLA’s five-year review would also be required to ensure that the remedial action remains protective of human health and the environment.

Groundwater Remedial Alternatives

As noted above, the interim groundwater remedy selected in March 1998 called for the treatment of the contaminated groundwater leaving the Liberty property. However, during the design of the interim groundwater remedy, it was learned that the principal source for Plume B is apparently upgradient of the property, and EPA decided that it was necessary to further evaluate this plume. EPA recently completed the fieldwork for this effort. Because it has been shown that effective treatment of Plume A will involve treating Plume B, EPA has determined that Plume B should be addressed as part of any Liberty comprehensive groundwater remedial action. A comprehensive groundwater remedy for the Liberty site would thus address contamination from both plumes. EPA is attempting to identify the location of the source of the Plume B contamination and will evaluate options for remediating the source once identified.

The contaminated groundwater at the Site will be remediated to federal and New York State drinking water and groundwater standards.

Alternative GW-1: No Action

Capital Cost:	$ 180,000
Total Operation and Maintenance Cost:	$ 1,080,000
Present Worth Cost:	$ 1,260,000
Construction Time:	Immediately

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the off-property groundwater contamination. However, this alternative does include the implementation of a groundwater monitoring program, which would include installation of eight shallow and eight deep monitoring wells. Quarterly sampling, analyses, and water level measurements from new as well as selected existing on-Site and off-Site monitoring wells would be performed to assess contaminant migration and the long-term effectiveness of this no-action alternative. Under this alternative, the interim groundwater action would cease operation after the three-year period (September 2003) authorized under the non-time critical removal action.

Because this alternative would result in contaminants remaining in the groundwater plume above drinking water standards, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions might be implemented to remove or treat the groundwater contamination.

Alternative GW-2: In-Well Groundwater Treatment with Continuation of the On-property Interim Groundwater Action

Capital Cost*:	$5,030,000
Total Operation and Maintenance Cost*:	$9,999,000
Present Worth Cost*:	$15,029,000
Construction Time:	1 year

* Includes the following costs for Plume B treatment system, employing the same innovative technologies: capital cost of $813,000, total 20-year operation and maintenance cost of $1,821,000, and present worth cost of $2,634,000.

Alternative GW-2 would involve the use of two innovative technologies to remove VOCs and metal contaminants in the groundwater below ground. The first treatment component would involve in-well vapor stripping which is also known as groundwater circulation well (GCW) technology. In such a system, air is pumped into a well causing groundwater in the vicinity of the well to circulate around and through the well, while at the same time causing volatile contaminants to volatilize or be bubbled out of the groundwater. The volatile contaminants would be captured by an above-ground vapor-phase granular activated carbon unit.

As air stripping is not an effective means of removing metals, removal of soluble metal contaminants would be accomplished through a second treatment component which would incorporate a chelating medium which is an organic medium that captures metals. Once the metal contaminants have been removed, the clean groundwater would be pumped back into the aquifers. The chelating materials would be periodically regenerated to remove the captured metals; the resulting metals-contaminated waste would be disposed of at an off-Site EPA-approved hazardous waste facility.

Because the off-property component of the plume in the Magothy aquifer is limited to VOCs (i.e., only VOCs in the upper portion of the Magothy aquifer as compared to VOCs and metals in the Upper Glacial aquifer), it would only require a GCW system for VOC removal; the off-property component of the plume in the Upper Glacial aquifer would, however, require a GCW system coupled with a metals-removal technology component. The optimal location for the off-property GCW treatment system would be between Woodward Parkway and the headwaters of the Massapequa Creek (i.e., east of Woodward Parkway Elementary School near where the elevated Site-related VOC concentrations have been detected). And, the optimal location for the off-property GCW treatment system coupled with a metals-removal technology component would be in the vicinity of monitoring well cluster MW-9, where the elevated Site-related metal concentrations have been detected. Three GCWs without a metals-removal technology component would be installed approximately 180 feet deep in the Magothy aquifer and three GCWs with a metals-removal technology component would be installed approximately 60 feet deep in the Upper Glacial aquifer. The total circulation rate of these six GCWs would be approximately 375 gallons per minute (gpm).

Because the hydrogeochemical characteristics of the Magothy aquifer are distinct from those of the Upper Glacial aquifer, pilot testing of the GCW treatment component, discussed above, would need to be conducted as part of the design effort to evaluate its effectiveness and feasibility in the Magothy aquifer.

Alternative GW-2 would also involve the continuation of the interim groundwater action with respect to the significantly-contaminated portion of the groundwater plume beneath the Site property within the Upper Glacial aquifer. The interim groundwater action employs innovative technologies identical to those described above. A total of three GCW systems have been installed approximately 90 feet deep into the bottom of the Upper Glacial aquifer, downgradient of the Former Wastewater Disposal Basins on the Site property and parallel to Motor Avenue. The three GCW systems are designed to handle a combined, average flow of 210 gpm. Plume B would also be addressed by installation and long-term operation of five GCW systems in the north-central portion of the Liberty property, within the Upper Glacial aquifer perpendicular to the direction of groundwater flow, to treat VOCs. The configuration of the Plume B treatment system as well as the cost estimates would be further refined upon EPA’s review of the recently completed field investigation.

Alternative GW-2 would also include an enhanced monitoring program to document and monitor the leading edge of the off-property groundwater contaminant plume where concentrations are near nondetectable levels or drinking water standards and, therefore, would render the application of any active groundwater remedial alternative economically infeasible. Under this alternative, a Site-specific groundwater fate and transport model would also be performed to assess the effectiveness of natural attenuation in the leading edge of the plume in conjunction with groundwater remediation.

In addition, institutional controls (e.g., deed restrictions to prohibit installation or use of groundwater wells for human consumption purposes) would need to be implemented.

<u>Alternative GW-3: Groundwater Extraction and Treatment with Continuation of Interim Groundwater Action</u>

Capital Cost*:	$ 5,200,000
Total Operation and Maintenance Cost*:	$12,424,000
Present Worth Cost*:	$17,624,000
Construction Time:	1 ½ years

* Includes the following costs for Plume B treatment system, employing the same conventional pump-and-treat technologies: capital cost of $509,000, total 20-year operation and maintenance cost of $1,814,000, and present worth cost of $2,323,000.

Alternative GW-3 would consist of a conventional groundwater pumping and treatment system. The off-property contaminated groundwater would be extracted from both aquifers and pumped to an above-ground treatment system. Inorganic contaminants such as metals would be treated through ion exchange, precipitation with coagulation, and filtration. Organic contaminants would be treated through air stripping coupled to liquid and vapor phase carbon. Treatability studies would be performed to determine the optimum operating parameters for the groundwater treatment system. Residual waste from the treatment process such as sludges from the metals-treatment stage would be disposed of off Site in accordance with all applicable or relevant and appropriate federal and State disposal requirements (e.g., RCRA Land Disposal Requirements (LDRs)); spent carbon used to remove organic contaminants would be handled similarly or regenerated.

Treated groundwater would be either reinjected into aquifers or discharged to the Massapequa Creek. Alternative GW-3 would also involve the continuation of performance of the interim groundwater action; however, it would continue as conventional pumping and treatment as described under the foregoing paragraph. The Plume B treatment system would be conventional pump and treat.

Due to significantly greater potential short-term and long-term impacts associated with construction of an off-property conventional pump-and-treat system, as compared to Alternative GW-2, the off-Site contaminated groundwater would be pumped back to the Liberty site for treatment at an on-property groundwater treatment system. One of the two extraction well clusters would be optimally located near the Woodward Parkway Elementary School (between Woodward Parkway and the headwaters of the Massapequa Creek) and the other near the Massapequa Creek, near present monitoring well cluster MW-9. The extraction well cluster near the Woodward Parkway Elementary School would be installed approximately 180 feet deep in the Upper Glacial aquifer and the extraction well cluster near the present monitoring well cluster MW-9, to the northwest of the Farmingdale High School, would be installed approximately 60 feet deep in the Magothy aquifer. The total pumping rate of these four groundwater extraction wells would be approximately 250 gpm. An aquifer pumping test to evaluate the hydrogeological characteristics of the Magothy aquifer would need to be conducted as part of the design.

For cost-estimating purposes, it was assumed that the extracted groundwater would be treated to meet drinking water standards required for aquifer reinjection. Approximately eight reinjection wells would be necessary. However, a detailed evaluation of groundwater reinjection would need to be conducted as part of the design effort.

The enhanced monitoring program provisions described under Alternative GW-2 would be carried out under Alternative GW-3.

In addition, the institutional controls and CERCLA five-year review required under Alternative GW-2 would also be required for Alternative GW-3.

Sediment Remedial Alternatives

As previously noted, based on the weight of evidence from the cumulative Massapequa Creek investigation, the remediation of Site-related contamination within the Massapequa Creek ponds will be limited to Pond A. Sediment cleanup levels of 50 mg/kg cadmium and 260 mg/kg chromium were developed for remediation of Pond A sediments. These remedial goals were established in recognition of the Site conceptual model, which indicates that if the groundwater contamination is addressed, the primary source of sediment and surface water contamination within the Massapequa Creek system will also be addressed. Moreover, removal of sediments within Pond A, the farthest upstream pond, where adverse ecological effects are greatest, would remove the primary source of contaminated sediments entering the creek below the site, and its lower ponds.

Alternative SD-1: No Action

Capital Cost:	$ N/A
Total Operation and Maintenance Cost:	$ 283,000
Present Worth Cost:	$ 283,000
Construction Time:	Immediately

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the sediment contamination within the Massapequa Creek ponds. However, this alternative does include the implementation of a Pond A sediment and surface water monitoring program. Quarterly sampling and analyses from Pond A sediment and surface water would be performed to assess the continued potential impact from the Site groundwater contaminant.

Because this alternative would result in Site-related contaminants remaining in Pond A, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions might be implemented to remove or treat the Massapequa Creek pond sediments.

Alternative SD 2: Excavation or Vacuum Extraction and Off-Site Disposal of Contaminated Sediments from Pond A

Capital Cost:	$ 2,989,000
Total Operation and Maintenance Cost:	$ 384,000
Present Worth Cost:	$ 3,373,000
Construction Time:	1 year

Alternative SD-2 would involve the removal of contaminated sediments from Pond A by either excavation or vacuum extraction. If the sediments were removed by excavation, the pond would be dewatered and then excavated to a desired average depth of 1.5 feet, or a depth sufficient to collect the impacted fine-grained sediments, using conventional earth moving equipment. The underlying coarse sandy and gravelly sediments were found to be not impacted and, therefore, would not be removed. The surface water drained from the pond and stormwater would be diverted temporarily to a detention basin or Massapequa Creek. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. If sediment were to be removed by the vacuum extraction method, draining of the pond or the temporary diversion of surface water and stormwater would not be necessary.

Removal of sediments, with a moisture content of 67%, to a depth of 1.5 feet throughout Pond A (138,000 square feet or 3.2 acres) would generate approximately 2,600 cubic yards of impacted sediments. These sediments would be staged adjacent to the pond and dewatered using a combination of passive draining and active filtration. The excess porewater would be returned to the pond. It is estimated that the volume of dewatered sediment would be approximately 1,300 cubic yards (or about 50% of the wet volume). The substrate of the ponds and any impacted wetlands would be restored. The dewatered sediments (i.e., the filter cake consisting of compressed sediment) would undergo a sediment contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the sediment residue would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste.

To ensure that Pond A remedy, as described above, is protective of the entire Massapequa Creek and Preserve, including the five lower ponds, the remedy will be integrated with an enhanced monitoring program for the remainder of the lower ponds that will consist of periodic surface water and sediment sampling and bioassays. It is expected that this program will further support its determination that only Pond A requires remediation, and demonstrate that removal of the contaminant source in Pond A will have a beneficial effect on downstream pond sediment quality.

SUMMARY OF 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 alternatives pursuant to the NCP, 40 Code of Federal Regulations (CFR) §300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following “threshold” criteria must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection

and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable (legally enforceable), or relevant and appropriate (requirements that pertain to situations sufficiently similar to those encountered at a Superfund site such that their use is well suited to the site) requirements of Federal and State environmental statutes and requirements or provide grounds for invoking a waiver.

The following “primary balancing” criteria are used to make comparisons and to identify the major trade-offs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume via treatment* refers to a remedial technology’s expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants at the site.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.

6. *Implementability* refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. *Cost* includes estimated capital and operation and maintenance costs, and the present worth costs.

The following “modifying” criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. *State acceptance* indicates whether, based on its review of the FS and the Proposed Plan, the State supports, opposes, and/or

has identified any reservations with the preferred alternative.

9. *Community acceptance* refers to the public's general response to the alternatives described in the Proposed Plan and the FS report. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above follows.

Soil Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SL-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. The contaminants identified in the soils would continue to migrate via all of the routes identified in the supplemental RI.

Alternative SL-3 would provide the greatest degree of overall protection because all 73,100 cubic yards of soils contaminated above groundwater protection soil cleanup levels would be permanently removed from the Site and disposed of at an off-Site EPA-approved hazardous waste facility (some of the soils may need to be treated to satisfy LDR requirements). Alternative SL-2 may not be protective if the western portion of the Site were used for unrestricted recreational use as proposed by the Town of Oyster Bay because such use would call into question the continued reliability of the cap, and SL-2 would otherwise be less protective than Alternative SL-3 in a commercial/industrial (and recreational for the extreme western portion of the Site) because under Alternative SL-2 some soil contamination above the cleanup levels would remain untreated beneath the cap. Alternative SL-2 would also require monitoring and institutional controls to ensure the integrity of the cap.

- Compliance with ARARs

This criterion is not applicable to the "no-action" alternative, Alternatives SL-1.

Alternatives SL-2 and SL-3 would comply with all ARARs, including the Long Island Landfill Law, RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities, RCRA LDRs, and the Department of Transportation manifest standards for transporters of hazardous waste, during the implementation of all on-Site excavation and off-Site disposal activities.

- Long-Term Effectiveness and Permanence

Alternative SL-1 would not provide any long-term effectiveness and permanence since it would not involve any measures for containing, controlling or eliminating any of the Site soil contaminants, or reducing the potential for exposure to these contaminants.

Alternative SL-3 would provide the greatest degree of long-term effectiveness and permanence, as it would result in removal and off-Site disposal of 73,000 cubic yards of contaminated soils from the Site. Alternative SL-2 would not achieve long term effectiveness and permanence if the western portion of the Site were used for unrestricted recreational use as proposed by the Town of Oyster Bay because such use would call into question the continued reliability of the cap. If the western portion of the Site were to be used for commercial/industrial (and recreational for the extreme western portion), then Alternative SL-2 would still be less effective over the long term because a smaller volume of contaminated soils (25,600 cubic yards) would be removed from the Site. A maintenance and inspection program would be required for Alternative SL-2 to ensure long-term effectiveness of the caps.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative SL-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken to address toxicity, mobility, or volume.

Although Alternatives SL-2 and SL-3 do not employ any treatment technology, both of these alternatives employ an off-Site disposal component that would result in reduction in toxicity, mobility, and volume of contamination at the Site. Alternative SL-3 would provide greater reduction than Alternative SL-2, as Alternative SL-3 would result in the off-Site disposal of 73,100 cubic yards of contaminated soils versus Alternative SL-2's 25,600 cubic yards of contaminated soils. Under both Alternatives SL-2 and SL-3, some of the soils may need to be treated to satisfy LDR requirements at an EPA-approved hazardous waste facility thereby reducing the toxicity and mobility of these contaminated materials at those locations.

- Short-Term Effectiveness

Alternative SL-1 would not include any construction and, therefore, would not present risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against principal Site threats.

Both Alternatives SL-2 and SL-3 would involve varying degrees of excavating, moving, placing, and regrading of contaminated soils. Therefore, both of these alternatives would present some potential risks to on-Site workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts associated, however, would be mitigated by utilizing appropriate conventional controls (e.g., dust suppression, mufflers, personal protection equipment, etc.). Both alternatives would also have potential impacts on the surrounding community as each of these alternatives involves the transport of contaminated soils from the Site. The potential short-term risks would be greater for Alternative SL-3 because this alternative involves the transport of a much greater volume of contaminated soils.

- Implementability

Alternative SL-1 can be readily implemented, as it would not include any physical remedial measures to address the soil contamination at the Site.

Alternatives SL-2 and SL-3 would be easily and equally implementable because both use conventional excavation and disposal technologies with proven reliability. Construction of the cap system specified in Alternative SL-2 can be accomplished using proven technologies; equipment, services and materials for this work would be readily available.

- Cost

The estimated capital, total operation and maintenance (O&M), and present-worth costs for each of Alternatives SL-1 through SL-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SL-1	$0	$0	$0
SL-2	$7,863,000	$1,077,000	$8,940,000
SL-3	$12,862,000	$230,000	$13,092,000

As indicated by the cost estimates, Alternative SL-1 has no associated cost, as it is a no-action alternative. Of the two action alternatives, Alternative SL-2 is less expensive than Alternative SL-3. The high cost associated with Alternative SL-3 is due to the excavation and off-Site disposal of 73,100 cubic yards of contaminated soils as opposed to excavation and off-Site disposal of 25,600 cubic yards of contaminated soils under Alternative SL-2.

Alternative SL-2 could be implemented at an estimated cost of $8,940,000, while the cost of implementing Alternative SL-3 is estimated at $13,092,000. Thus, Alternative SL-2 could be implemented for $4,152,000 less than Alternative SL-3, or 68% of the cost of Alternative SL-3. While this is a significant cost difference, it is much less than the cost differential estimated by EPA at the time of issuance of the Proposed Plan.

- State Acceptance

The NYSDEC concurs with the **selected remedy, Excavation and Off-Site Disposal of 73,100 Cubic Yards of Site Soils (SL-3), with Excavation and Off-Site Disposal of 25,600 Cubic Yards of Site Soils, Followed by Placement of an Impermeable Cap over 8.75 Acres of Low-level Contaminated Soils (SL-2), as Contingent Remedy if the Town of Oyster Bay does not acquire all or most of the Western portion of the Site that would otherwise be under the cap for recreational uses, and institutional controls)**. A letter of concurrence is attached as **Appendix V**.

- Community Acceptance

Community acceptance of the selected remedy for soil was assessed during the public comment period. Comments were expressed at the August 9, 2001 public meeting and the January 9, 2002 public availability session, and written comments were received during the public comment period. Members of the community and their elected representatives overwhelmingly disfavored Alternative SL-2 and supported Alternative SL-3, and requested EPA to change the proposed alternatives for soil remediation from Alternative SL-2 to

Alternative SL-3. The commentors expressed their concern over the long-term effectiveness and durability of the 8.75-acre capping component of the selected soil remedy. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V**.

Groundwater Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative GW-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. Groundwater contamination identified in the significantly-contaminated off-property portions of Plumes A and B would not be addressed, while the on-property portions of these plumes would only be addressed for the three-year period authorized under the non-time-critical removal action.

Alternative GW-3 would be the more protective of the two action alternatives in permanently removing VOCs and metals from the Upper Glacial Aquifer, and VOCs from the Magothy aquifer. Alternatives GW-2 may not be as protective, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced. Both of these alternatives would limit the migration of groundwater contaminants further downgradient, because the groundwater circulation wells being converted to extraction wells associated with Alternative GW-2 and the extraction wells associated with Alternative GW-3 would be designed to have overlapping capture zones and would provide effective capture of the groundwater contaminant plume.

- Compliance with ARARs

Both Alternatives GW-2 and GW-3 would comply with all ARARs, such as the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities, the Clean Air Act (e.g., ambient air quality standards), and the Department of Transportation manifest standards for transporters of hazardous waste. However, it needs to be noted that Alternative GW-3 involves a conventional groundwater extraction and treatment which has been widely used with proven reliability, whereas Alternative GW-2 involves innovative technologies that may present operational difficulties based on experience with the interim groundwater. Alternative GW-3 would also need to comply with the drinking water standards for aquifer reinjection or limitations for discharge to

Massapequa Creek. In addition, Alternatives GW-2 and GW-3 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls.

- Long-Term Effectiveness and Permanence

Alternative GW-1 would not provide any long-term effectiveness and permanence, as it would not address the remedial action objectives for the Liberty site.

Alternatives GW-3 would provide a higher degree of long-term effectiveness and permanence than Alternative GW-2 through the removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer. Alternatives GW-2 may not provide as high a long-term effectiveness and permanence as would Alternative GW-3, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative GW-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken under this alternative.

Alternatives GW-3 would provide a higher reduction in toxicity, mobility, and volume through treatment than Alternative GW-2, through the permanent removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer. Alternatives GW-2 may not provide as high a reduction in toxicity, mobility, and volume through treatment as would Alternative GW-3, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced.

- Short-Term Effectiveness

Alternative GW-1 would not include any construction measures and, therefore, would not present any risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against the threats posed by the contaminated groundwater.

Alternatives GW-2 and GW-3 would pose minimal potential adverse risks to to the community, workers, and the environment over the short term. Potential risks for these alternatives would be those typically associated with construction activity, and an appropriate health and safety program would be established to minimize any such risks. Alternative GW-3 would entail greater intrusive activities (e.g., additional trenching/piping activities to connect the extraction wells to the off-property groundwater treatment system) than Alternative GW-2 in the construction of their respective off-property groundwater treatment systems. The potential for any adverse short-term impacts associated with the construction activities, however, would be addressed by utilizing appropriate conventional and engineering controls (e.g., dust suppression, mufflers, personal protection equipment, etc.).

- Implementability

Alternative GW-1 would be the most readily implementable as it is a no-action alternative, followed in order by Alternatives GW-2 and GW-3.

Of the two action groundwater remedial alternatives, Alternative GW-2 would be the more readily implementable, as Alternative GW-2 would employ the same innovative technologies that are being used successfully for the interim groundwater action. Although Alternative GW-3 would involve conventional groundwater extraction and treatment which has been widely used with proven reliability, it would be more difficult to construct than Alternative GW-2 because of the size of the treatment plant and the amount of piping necessary to accommodate the high groundwater pumping rate. In addition, Alternative GW-3 would necessitate acquiring public or private property (between Woodward Parkway and the headwaters of the Massapequa Creek) to site the treatment system.

- Cost

The estimated capital, total O&M, and present-worth costs for each of Alternatives GW-1 through GW-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
GW-1	$180,000	$1,080,000	$1,260,000
GW-2	$5,030,000 [1]	$9,999,000 [1]	$15,029,000 [1]
GW-3	$5,200,000 [2]	$12,424,000 [2]	$17,624,000 [2]

[1] Includes the following costs for Plume B treatment system, employing the same innovative technologies: capital cost of $813,000, total 20-year operation and maintenance cost of $1,821,000, and present worth cost of $2,634,000.

[2] Includes the following costs for Plume B treatment system, employing the same conventional pump-and-treat technologies: capital cost of $509,000, total 20-year operation and maintenance cost of $1,814,000, and present worth cost of $2,323,000.

As indicated by the cost estimates, there is a significant cost increase between Alternative GW-1, the no-action alternative, and the other action alternatives, GW-2 and GW-3. Of the two action alternatives, Alternative GW-3 is more expensive than Alternative GW-2, due to the added O&M costs associated with a conventional groundwater extraction and treatment system.

- State Acceptance

As stated above, the NYSDEC concurs with the selected remedy, **Conventional Pump and Treat with Continuation of the On-property Interim Groundwater Action (GW-3) by Conventional Pumping and Treatment and Institutional Controls**. A letter of concurrence is attached as **Appendix V**.

- Community Acceptance

Community acceptance of the selected remedy for groundwater was assessed during the public comment period. The community generally supports Alternative GW-3. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V**.

Sediment Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SD-1 would provide no protection of ecological receptors, as it would not meet the remedial action objectives for the Liberty site; the contaminants identified in Pond A sediments would continue to pose a threat to ecological resources in this ecosystem. Alternative SD-2 would be fully protective of human health and the environment via permanent removal of 2,600 cubic yards of contaminated sediments in Pond A and the enhanced monitoring program for the remainder of the lower ponds.

- Compliance with ARARs

This criterion is not applicable to the “no-action” alternative, Alternative SD-1.

Alternative SD-2 would comply with all ARARs, including the NYSDEC surface water quality standards. In addition, due to associated off-property construction activities, Alternative SD-2 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls. Alternative SD-2 would also comply with the Department of Transportation manifest standards for transporters of hazardous waste and the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities

- Long-Term Effectiveness and Permanence

Alternative SD-1 would not provide any long-term, effective or permanent measures for containing, controlling or eliminating any of the contaminated sediments within Pond A, or reducing the potential for exposure to these contaminants. Alternative SD-2 would be effective in protecting ecological resources over the long term in that it would result in the permanent removal of 2,600 cubic yards of contaminated sediments from Pond A.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Because Alternative SD-1 is the “no-action” alternative, it would not result in any reduction in the toxicity, mobility, or volume of contaminants present in the impacted ecosystems. Alternative SD-2 would substantially reduce the volume, toxicity, and mobility of contaminants present in Pond A sediments, as a result of removal, and off-Site transport and disposal of 2,600 cubic yards of contaminated sediments.

- Short-Term Effectiveness

Alternative SD-1 would not include any construction measures and, therefore, would not present potential risks or adverse short-term impacts to Site workers or the environment as a result of its implementation. Alternative SD-2 would present some potential risks to workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts to Site workers, however, would be readily mitigated by using personal protection equipment and following appropriate health and safety procedures. Alternative SD-2 would also present short-term impacts to wetlands, flora, and fauna. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. Following the implementation of Alternative SD-2, wetlands restoration would be required.

- Implementability

Alternative SD-1 can be readily implemented, as it would not include any physical remedial measures to address the Pond A sediments. Although Alternative SD-2 would use conventional excavation or vacuum extraction technologies which have proven reliability, it would be less readily implementable than Alternative SD-1, as Alternative SD-2 may require the resolution of issues that could arise from coordinating and consulting with State and local regulatory agencies (e.g., NYSDEC Bureau of Fisheries and Wildlife, Nassau County Department of Recreation and Parks, and Nassau County Department of Public Works). These issues would likely include delineation and restoration of sensitive or ecologically valuable wetlands.

- Cost

The estimated capital, total O&M, and present-worth costs for Alternatives SD-1 and SD-2 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SD-1	N/A	$283,000	$283,000
SD-2	$2,989,000	$384,000	$3,373,000

The costs associated with Alternative SD-1 are for a Pond A sediment and surface water monitoring program whereas the costs for Alternative SD-2 are for removal of contaminated sediments from Pond A.

- State Acceptance

As stated above, NYSDEC concurs with the selected remedy, **Excavation and Off-Site Disposal of 2,600 Cubic Yards of Contaminated Pond a Sediments (SD-2) with an enhanced monitoring program for the remainder of the lower ponds**. A letter of concurrence is attached as **Appendix V.**

- Community Acceptance

Community acceptance of the selected remedy for Pond A sediment was assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V**.

PRINCIPAL THREAT WASTES

There are no source materials that meet the definition of principal threat wastes at the Site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, NYSDEC and EPA have determined that Alternative GW-3 (Conventional Pump and Treat with Continuation of the On-property Interim Groundwater Action by Conventional Pumping and Treatment and Institutional Controls), to address the on-property and off-property groundwater contamination, Alternative SD-2 (Excavation and Off-Site Disposal of 2,600 Cubic Yards of Contaminated Pond A Sediments with an enhanced monitoring program for the Remainder of the Lower Ponds), to address Massapequa Creek sediments, and Alternative SL-3 (Excavation and Off-Site Disposal of 73,100 Cubic Yards of Site Soils, investigation and remediation of USTs, features and sanitary leaching fields and institutional controls) to address the Site soils and features, are the appropriate remedies, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR 5300.430(e)(9).

The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and is favored by the community and the State. Unlike Alternative GW-2, Alternative GW-3 utilizes well demonstrated treatment technologies; as noted above, during the implementation of the non-time-critical groundwater removal action, the innovative treatment technologies specified in Alternative GW-2 proved to be problematic, as many operational difficulties were experienced. Alternative GW-1 (No

Action) would not be protective of human health and the environment, since it would not actively address the potential human health and ecological risks posed by the contaminated media.

Alternative SD-2 eliminates all potential adverse effects to ecological receptors within the Massapequa Creek from exposure to Site-related contaminants, Alternative SD-1, the no-action alternative, would not address these risks.

Alternative SL-1 would not be protective of human health nor the groundwater resource, since it would not address contaminated features or the contaminants in the soils that continue to serve as a source of groundwater contamination. Alternative SL-3, as well as Alternative SL-2 (if constructed and maintained properly) would both be protective of human health and the groundwater resource. Alternative SL-2 would provide this protection at less cost than Alternative SL-3, however Alternative SL-3 provides a greater degree of long-term effectiveness and permanence. Alternative SL-3 garnered overwhelming support from the community, while the community was opposed to Alternative SL-2.

The Proposed Plan identified Alternative SL-2 as the Preferred Remedy for addressing the soil contamination at the Site. However, during the comment period the Town of Oyster Bay indicated that it had taken significant steps towards formalizing plans to acquire the western portion of the Site, including nearly all of the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town indicated that the recreational uses planned for the property would include walking/nature trail and sensory gardens, a picnic area, cabins and campgrounds for Boy Scout outings. The development of the property would be phased in over a period of 10 years or more. This would result in disruption of significant portions of the property for trenching (utilities and irrigation), digging (for the planting of trees and shrubbery) and excavation (for the building of rest room facilities, cabins, trails, etc.). The cap component of Alternative SL-2 would be incompatible with Town’s proposed use of the park over the short and long term. The Town’s proposed use of the park might also compromise monitoring and maintenance the cap, thereby compromising the long-term effectiveness of the remedy. This information resulted in a re-evaluation of Alternative SL-2 and SL-3 against the criteria listed in the NCP, and other program goals. Alternative SL-3 is the selected soil remedy contingent upon the Town’s acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6-8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy.

Description of the Selected Remedy

The major components of the selected remedy include:

① Groundwater (Alternative GW-3):

- continued operation of the ongoing interim groundwater treatment system that is being converted to a conventional pump-and-treat system to address the groundwater underlying the Site property contaminated by previous operations at the Site,

- continuation of interim groundwater action by construction and operation of a conventional pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon with Two Groundwater Extraction Wells) to address groundwater underlying the Site property which is believed to have been contaminated by an upgradient source,

- construction and operation of a conventional 250-gpm pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon with Four Groundwater Extraction Wells) to treat off-property groundwater contamination,

- construction of all groundwater treatment systems on the Liberty property,

- restoration of the aquifer through reduction of contaminant levels to State and Federal MCLs (e.g., 5 μg/l for cadmium, 50 μg/l for chromium, and 5 μg/l for TCE, cis-1,2-DCE, and PCE),

- discharge of treated groundwater to Massapequa Creek surface water or reinjection of treated groundwater into the aquifer,

- implementation of a groundwater monitoring program, and

- institutional controls to prohibit installation or use of groundwater wells for human consumption.

② Massapequa Preserve (Alternative SD-2):

- excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments within Pond A of nearby Massapequa Creek and Preserve, and

- implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve to demonstrate that the removal of Pond A sediments is protective of the downstream ecosystem from contaminants associated with the Liberty site.

③ Soils (Alternative SL-3):

- excavation and off-Site disposal of all soils contaminated above groundwater protection levels (10 mg/kg cadmium and 143 mg/kg chromium), estimated at 73,100 cubic yards,

- removal of contaminated aqueous and/or solid materials from three underground storage tanks and fifty-six subsurface features, as well as from the northern and eastern sanitary leaching fields, if warranted (it is expected that one underground storage tank, approximately thirty-eight subsurface features, the entire eastern sanitary leaching field, and a small portion of the northern sanitary leaching field will be addressed separately pursuant to the Features AOC),

- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed 10 mg/kg cadmium, 143 mg/kg chromium, 0.7 mg/kg TCE, 0.25 mg/kg cis-1,2-DCE, 1.4 mg/kg PCE,; 1 mg/kg PCBs for soils between zero and 1 foot bgs and 10 mg/kg PCBs for soils below 1 foot bgs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, or 0.29 mg/kg dibenzo[a,h]anthracene, and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

The major components of the contingent remedy for soils (Alternative SL-2) include:

- excavation and off-Site disposal of approximately 25,600 cubic yards of soils including: (1) contaminated soils that would be rendered TCLP hazardous, (2) soils in the groundwater table fluctuation zone (approximately 15-21 ft bgs) above the groundwater protection soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium, and (3) any soil above the groundwater protection soil cleanup levels that is excavated to access the soils in (1) and (2),

- placement of an impermeable cap (with a surface permeability of 5×10^{-8} cm/sec or less) or engineered structure, such as a building, over 8.75 acres of low-level contaminated soils with a requirement to maintain the integrity of the cap,

- removal of contaminated features and associated soils, as described above, in the selected remedy, and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational and an institutional control to prevent activities that could compromise the integrity of the cap.

Note that many of the specific details provided in this section are provided for conceptual purposes and cost estimating purposes; these details may change somewhat during the remedial design and construction process.

Summary of Estimated Remedy Costs

The estimated capital cost for the selected remedy is $21,052,000. The total present worth cost is $34,090,000. The total present worth is the sum of capital cost, periodic costs and the present-worth cost of O&M, which are based on a 7% discount rate and a project life of 20 years, for GW-3, SD-2, and SL-3. A detailed breakdown of the costs of the selected remedy are provided in **Tables 8, 9, and 10.** If the contingency soil remedy Alternative SL-2 is implemented the total capital cost and present worth cost would be $18,833,000 and $29,938,000, respectively; the project life for Alternative SL-2 was assumed to be 50 years. A detailed breakdown of the costs of the contingent remedy (Alternative SL-2) is provided in **Tables 11**.

These engineering cost estimates are expected to be within +50 to -30 percent of the actual project cost, and are based upon the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

Based upon the human health and ecological risk assessments, NYSDEC and EPA have determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected alternative or one of the other active measures considered, present a current or potential threat to public health or the environment.

Specifically, it has been concluded that: (1) construction workers would be at risk via exposure to aqueous waste in the subsurface features, (2) there are potential cross-media impacts to groundwater, (3) there is a potential health risk associated with future use of the contaminated groundwater as a potable water source, and (4) there is a potential risk to ecological receptors from exposure to Pond A sediments.

The selected alternative will remove the contaminants in features that present a risk to construction workers, remove contaminants in soils that are continuing to serve as a source of contamination to groundwater, extract and treat contaminated groundwater in the sole-source aquifer system so that the groundwater can be restored to its best beneficial use, and remove contaminated sediments from Pond A such the sediments no longer presents a risk to ecological receptors. Potential for short-term human health or ecological risks that could occur while the features, soils and pond sediments are being excavated and transported, can be minimized with fencing, controls on fugitive dusts, maintenance of temporary covers; institutional controls will prevent utilization of contaminated groundwater at the Site until such time as the groundwater is restored. The selected remedy will be cost-effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy will also meet the statutory preference for the use of treatment as a principal element. Finally, the selected remedy will provide overall protection of human health and the environment due to contaminants at the Site.

These actions will restore the Site such that it can be utilized in the future in accordance with the reasonably-anticipated future land use. Under the selected remedy, it is anticipated that it will require approximately one year to complete the design of the source control remedy, and one and a half years to implement the remedy (this time frame would also apply to the contingent remedy). With regard to groundwater, it is anticipated that it will take approximately 2 years to complete the design of the comprehensive system and approximately one and a half years to construct the groundwater collection system. Groundwater cleanup standards are not expected to be achieved for 20 years. The Pond A sediment excavation is expected to be initiated within 2 years and take approximately one year to complete. The property is currently zoned for commercial and light industrial use, though the Town is expected to acquire the western 15 acres of the Site for parkland use. Plans are currently before the Town Board for a supermarket and refueling facility on the easternmost 10 acres. The five remaining acres are also expected to be used for commercial purposes. The aforementioned uses of the property are not expected to change. It is also anticipated that the future use of the groundwater below the Site will not be a drinking water source, although the aquifer does serve as a sole-source aquifer, and there are several public water supply wells downgradient of the Site.

STATUTORY DETERMINATIONS

As previously noted, CERCLA §121(b)(1), 42 U.S. C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, be 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(4), 42 U.S.C. §9621(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), 42 U.S.C. §9621(d)(4). For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of CERCLA §121, 42 U.S.C. §9621.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. The groundwater extraction and treatment component of the remedy will be effective in achieving protection of human health and the environment over the long term, by restoring groundwater quality to levels which meet State and Federal MCLs. The excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments from Pond A will result in the removal of a significant volume of Site-related contamination from this ecosystem, thereby eliminating any potential adverse effects to ecological receptors within the Massapequa Creek from exposure to these contaminants. The soil remediation component of the selected remedy, that is the excavation and off-Site disposal of approximately 73,000 cubic yards of soil with contaminant levels above the groundwater protection cleanup numbers, will eliminate the cross media impacts to the groundwater, thereby expediting the groundwater restoration and protecting human health and the environment over the long term; in addition the removal of contaminants in the Site features on the eastern portion of the Site will eliminate the future risk posed to construction workers. This remedy also requires the implementation of institutional controls to prevent residential use of the property. Although SL-3 provides a greater level of protectiveness, the contingency remedy for soils would also be protective of human health and the environment. However, because the contingency remedy only requires the excavation and off-Site disposal of 25,600 cubic yards of the most highly contaminated on-Site soils, and requires that a cap be placed over an area of approximately 8.75 acres of low-level contaminated soils, it will rely on an engineered cap and institutional controls to maintain the integrity of the cap to protect human health. The implementation of the remedy, or contingency remedy, will not pose any unacceptable short term risks.

Compliance with ARARs

The National Contingency Plan, Section 300.430 (f)(ii)(B) requires that the selected remedy attain federal and State ARARs. The remedy will comply with the following action-, chemical- and location-specific ARARs identified for the Site and will be demonstrated through monitoring, as appropriate.

Action-Specific ARARs:

- 40 CFR Part 50, National Ambient Air Quality Standards

- 40 CFR Part 61 - National Emissions Standards for Hazardous Air Pollutants

- 40 CFR Part 254.25 - Excavation and Fugitive Dust Emissions

- 49 CFR 173 - Off-Site Transportation of Radioactive Materials

- 40 CFR Parts 260-268 - RCRA Standards for Handling, Transportation and Disposal of Hazardous Waste, including Land Disposal Restrictions

- 6 NYCRR Part 200.6 - Ambient Air Quality Standards

- 6 NYCRR Part 257, Air Quality Standards

- 6 NYCRR Part 212, Air Emission Standards

- 6 NYCRR Parts 370-373 - New York State Standards for Handling, Transportation and Disposal of Hazardous Waste

Chemical-Specific ARARs:

- 40 CFR Part 141 - Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs)

- 6 NYCRR Part 703 - New York Water Quality Standards

- 10 NYCRR Part 5 - New York State Sanitary Code for Drinking Water

Location-Specific ARARs:

- National Historic Preservation Act

- Executive Order 11990 - Protection of Wetlands

- Executive Order 11988 - Floodplain Management

- New York Environmental Conservation Law §27-0704 - Long Island Landfill Law

To-Be-Considered:

- Air Guide I - NYSDEC Control of Toxic Ambient Air Contaminants

- NYSDEC TAGMs 4003 - Hazardous Soil Cleanup Levels

- New York Guidelines for Soil Erosion and Sediment Control

Cost-Effectiveness

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs, O&M costs and periodic costs have been estimated and used to develop present worth costs. In the present-worth cost analysis, annual costs were calculated for 20 years for the selected remedy (GW-3, SD-2, and SL-3) (for contingent soil remedy SL-2, 50-year time frame was used) using a seven percent discount rate, with 2002 as the base year.

The selected remedy for groundwater GW-3, while somewhat more costly than GW-2, provides greater overall effectiveness compared to costs than GW-2 because it utilizes well demonstrated treatment technologies; as noted above during the implementation of the non-time critical groundwater removal action, the innovative treatment technologies specified in GW-2 proved to be problematic, as many operational difficulties were experienced.

The selected remedy for Massapequa Creek sediments will eliminate all potential adverse effects to ecological receptors within the Massapequa Creek from exposure to Site-related contaminants, the no-action alternative does not address these risks and therefore is not cost-effective.

While the selected remedy for soil Alternative SL-3 will be more costly than Alternative SL-2, it is a permanent remedy that will be compatible with the Town’s plans for utilizing the western portion of the property for passive and active parkland. Therefore, its costs are proportional to its overall effectiveness. The contingency remedy Alternative SL-2 would only be implemented if the Town does not acquire the western portion of the Site for parkland. Under this situation, the contingency remedy could be compatible with existing zoning and uses of the property at a lower cost than Alternative SL-3.

The selected comprehensive remedy for the Site will achieve the goals of the response actions and is cost-effective because it will provide the best overall effectiveness in proportion to its cost. For a detailed breakdown of costs associated with the selected remedy, please see **Tables 8, 9, and 10**.

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

EPA has determined that the selected remedy meets the statutory requirement to utilize permanent solutions and treatment technologies to the maximum extent practicable. The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and favored by the community and the State. The alternative treatment technologies specified in Alternative GW-2 proved to be problematic during the non-time-critical removal action. The selected remedy for Massapequa Creek sediments satisfies all of the nine criteria to a greater extent than the no-action alternative. The selected soil remedy, Alternative SL-3, is more protective and permanent over the long term than Alternative SL-2; it provides a greater degree of reduction of toxicity, mobility and volume of contaminants at the Site than Alternative SL-2. Alternative SL-3 is also widely acceptable to the public and compatible with the planned long-term uses of the property. The selection of Alternative SL-3, however, is contingent upon the completion of the Town's acquisition of the property for parkland. If the Town does not acquire the property, then Alternative SL-2 will be implemented as the contingency soil remedy. While Alternative SL-2 is not as permanent a soil remedy as Alternative SL-3, and does not have wide public support, it would still be protective of human health and the environment at less cost than Alternative SL-3.

The selected comprehensive remedy represents the most appropriate solution to contamination at or from the Site in the soil, groundwater, and Massapequa Preserve sediment because it provides the best balance of trade-offs among the alternatives with respect to the nine evaluation criteria.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied by the selected remedy. The selected remedy for groundwater would meet the statutory preference for the use of treatment as a principal element. The selected sediment remedy will also meet the statutory preference for the use of treatment as a principal element, to the degree that treatment would be required prior to disposal at an off-Site EPA-approved hazardous waste facility. The selected remedy for soil would meet the statutory preference for the use of treatment as a principal element, to the degree that treatment would be required prior to disposal at an off-Site EPA-approved hazardous waste facility, as will the contingency remedy for soil. There are no principal threat wastes present at the Site.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted at five-year intervals starting after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Selected Remedy is different from the Preferred Alternative outlined in the July 2001 Proposed Plan in two important aspects discussed below.

The Proposed Plan identified Alternative GW-2 as the Preferred Alternative. This alternative relied on innovative technologies for groundwater remediation. However, because the interim groundwater treatment system, which also employed the innovative technologies, was experiencing operational difficulties, that prevented the system from continuous operation and effective treatment of groundwater contamination, it was determined that traditional pump and treat technologies should be employed to capture and treat the groundwater contamination. In January 2002 steps to convert the on-Site system into a conventional pump and treat system were initiated. Subsequently, at the January 2002 availability session, the public was informed that Alternative GW-2 was being replaced with Alternative GW-3 as the Agency's preferred groundwater remedy. The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and is favored by the community and the State.

The Proposed Plan identified Alternative SL-2 as the Preferred Remedy for addressing the soil contamination at the Site. During the comment period, in letters to EPA and at the public meetings, the community expressed very strong support in favor of Alternative SL-3 and against Alternative SL-2. Also, based in part upon comments received during the public comment period, EPA re-evaluated the cost of the soil alternatives and determined that the difference in cost between SL-3 and SL-2 had narrowed substantially from what had been assumed for the Proposed Plan. Moreover, during the comment period the Town of Oyster Bay (Town) publicly announced significant steps towards formalizing plans to acquire the western portion of the site, including nearly all of the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town indicated that the recreational uses planned for the property would include walking/nature trail and sensory gardens, a picnic area, cabins and campgrounds for Boy Scout outings. The development of the property would be phased in over a period of 10 years or more. This would result in disruption of significant portions of the property for trenching (utilities and irrigation), digging (for the planting of trees and shrubbery) and excavation (for the building of rest room facilities, cabins, trails, etc.). The cap component of Alternative SL-2 would be incompatible with Town’s proposed use of the park over the short and long term. The Town’s proposed use of the park might also compromise monitoring and maintenance the cap, thereby compromising the long-term effectiveness of the remedy. This information resulted in a re-evaluation of Alternative SL-2 and SL-3 against the criteria listed in the NCP, and other program goals. Alternative SL-3 is the selected soil remedy contingent upon the Town’s acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6-8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy.

APPENDIX I

MARCH 25, 2002 LIBERTY INDUSTRIAL FINISHING SITE HUMAN HEALTH RISK ASSESSMENT ADDENDUM - WESTERN PARCEL

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II
Emergency and Remedial Response Division
290 Broadway, 18th Floor
New York, New York 10007-1866

MEMORANDUM

TO: Lorenzo Thantu, RPM
ERRD/New York Remediation Branch

FROM: Michael Sivak, Risk Assessor
ERRD/Program Support Branch

DATE: March 25, 2002

RE: Liberty Industrial Finishing
Human Health Risk Assessment Addendum - Western Parcel

As requested, I have evaluated potential cancer risks and noncancer hazards associated with the planned future use of the Western Parcel of the Liberty Industrial Finishing Superfund site. This evaluation is consistent with the baseline human health risk assessment (BHHRA) finalized in July 2000, and follows existing EPA guidance and policy.

Redevelopment plans for the Western Parcel may include a community swimming pool, ballfields, walking/jogging trails, or other recreational facilities. The BHHRA evaluated the potential for recreational development of the Western Parcel, based on the current scenario which is limited primarily to ballfields. The expanded recreational facilities may result in exposure scenarios which were not included in the BHHRA. Therefore, this addendum addresses the potential for exposure and any resultant health effects associated with the recreational redevelopment of the Western Parcel.

Hazard Identification

The Hazard Identification for the Western Parcel is consistent with the BHHRA. The contaminants identified in the soils were screened against EPA Region 3 Risk-Based Concentrations (RBCs) in order to focus the risk assessment on a list of chemicals of potential concern. This list can be found in the RAGS Part D Table 2.

Exposure Assessment

The exposure assumptions used in this assessment were developed based on site-specific activity patterns presumed for recreational activities at the Western Parcel. Due to its location in a primarily residential neighborhood, exposure patterns were identified which considered the fact that people would regularly frequent any recreational facilities at the Western Parcel. The exposure pathways included in the evaluation consisted of adults, adolescents (aged 6 - 18 years), and children (under the age of 6 years), visiting the site for recreational purposes, with exposure through incidental ingestion and dermal contact with soil. These exposure pathways are included in RAGS Part D Table 1. The exposure parameters, when appropriate, are consistent with the BHHRA.

There are two significant differences between this addendum and the recreational scenario included in the BHHRA. First, the adolescent population has been revised to include children aged 6 -18 years. The BHHRA evaluated children aged 10 -18 years. The adolescent population was revised to more clearly represent the populations which may frequent a community recreational area. Second, because of the potential for a swimming pool, several exposure parameters were revised to more accurately reflect the exposure scenarios for those people who would visit a community pool/recreational facility. The exposure frequencies used in the addendum are 221 days/year for the reasonable maximum exposure (RME) scenario, and 156 days/year for the central (average) tendency (CTE). The RME value is based on exposure of 7 days/week for the 13 summer weeks, 4 days/week for the 26 spring and fall weeks, and 2 days/week for the 13 winter weeks, while the CTE value considers 5 days/week for the 13 summer weeks, 3 days/week for the 26 spring and fall weeks, and 1 days/week for the 13 winter weeks. The skin surface area which is expected to be exposed was developed based on the potential for a community swimming pool to be located on the Western Parcel. Under this scenario, the RME scenario is based on the head, trunk, upper extremities, lower legs, and feet, while the CTE considers all of these, except for the trunk. These parameters are listed in RAGS Part D Table 4.

The exposure point concentrations used in the addendum were developed according to the methods described in the BHHRA. These values can be found in RAGS Part D Table 3.

Toxicity Values

The toxicity values used in this assessment are consistent with the values in the BHHRA. These values are provided in RAGS Part D Tables 5 (noncancer toxicity data) and 6 (cancer toxicity data). The references for these data are listed in the BHHRA.

Risk Characterization

Cancer risks and non-cancer health hazards are developed by combing information regarding exposure with toxicity values. The cancer risks are provided as a probability while the non-cancer hazards are provided as a comparison to the Reference Dose, a level where non-cancer health effects are not expected to occur. It is important to recognize that the calculated hazard index does not predict a specific disease.

RAGS Part D Tables 7 and 8 provide the estimated non-cancer health hazards and excess lifetime cancer risks (CR), respectively, to the individuals identified as potential receptors to the recreational facilities at the Western Parcel. These hazards and risks are summarized in RAGS

Part D Table 9.

As shown in Table 9.1, the non-cancer health hazards to the adult recreational user, exposed through incidental ingestion and dermal contact, are within EPA's acceptable level of a hazard index (HI) of less than or equal to l, while the CR are within the acceptable range of 10^{-6} to 10^{-4}.

The potential risks and hazards to the adolescent are shown in RAGS Part D Table 9.2. In this table, it can be seen that the CR is within the acceptable range. The total hazard index slightly exceeds the acceptable level of an HI of 1. When this occurs, the next level of evaluation requires that the HI for each target organ should be calculated to see if the HI for any target organ exceeds the acceptable level. As shown in RAGS Part D Table 9.2, the HI for each target organ is below the benchmark value of 1. This indicates that adverse health effects are not expected for the adolescent.

RAGS Part D Table 9.3 presents the risks and hazards to the child recreational user. The CR is within the acceptable range. The HI value of 8.6 exceeds the benchmark value of 1. As shown in Table 10, the significant contributors to this value are cadmium (individual hazard quotient of 4.0) and hexavalent chromium (individual hazard quotient of 1.4). These hazard quotients indicate the potential for noncancer health effects if no remediation occurs.

/MAS

TABLE 1

SELECTION OF EXPOSURE PATHWAYS - Western Parcel

SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Soil	Western Parcel	Recreational User	Adult	Ingestion Dermal Contact	On-Site	Quant.	Future plans are to develop a park which may include a swimming pool, ball fields and other recreational areas.
				Recreational User	Youth (6 - 18 years)	Ingestion Dermal Contact	On-Site	Quant.	Future plans are to develop a park which may include a swimming pool, ball fields and other recreational areas.
				Recreational User	Child (> 6 Years)	Ingestion Dermal Contact	On-Site	Quant.	Future plans are to develop a park which may include a swimming pool, ball fields and other recreational areas.

TABLE 2 (Page 1)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Western Parcel
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
57125	Cyanide	11.8		243		mg/kg	See Table 2.1	6/14	See Table 2.1	243		1.6E+002			YES	ASL
7429905	Aluminum	591		130000		mg/kg	See Table 2.1	14/14	See Table 2.1	130000	33,000	7.8E+003			YES	ASL
7440360	Antimony	2.8	B	145	JN	mg/kg	See Table 2.1	4/14	See Table 2.1	145		3.1E+000			YES	ASL
7440382	Arsenic	1.6	B2S	26		mg/kg	See Table 2.1	14/14	See Table 2.1	26	8	4.3E-002			YES	ASL
7440393	Barium	11.9	B2	500		mg/kg	See Table 2.1	12/12	See Table 2.1	500	300	5.5E+002			NO	BSL
7440417	Beryllium	0.24	B3	0.67	B	mg/kg	See Table 2.1	10/14	See Table 2.1	0.67	0	1.6E+001			NO	BSL
7440439	Cadmium	0.21	B4	2510		mg/kg	See Table 2.1	55/76	See Table 2.1	2510	1	7.8E+000			YES	ASL
7440702	Calcium	181	B2	4260		mg/kg	See Table 2.1	14/14	See Table 2.1	4260	35,000				NO	NUT
7440473	Chromium	2.88		17200		mg/kg	See Table 2.1	77/77	See Table 2.1	17200	40	2.3E+001			YES	ASL
7440484	Cobalt	0.73	B2	8.4	B	mg/kg	See Table 2.1	14/14	See Table 2.1	8.4	30	7.8E+002			NO	BKG
7440508	Copper	5	B3	4720		mg/kg	See Table 2.1	14/14	See Table 2.1	4720	25	3.1E+002			YES	ASL
7439896	Iron	3120		29500		mg/kg	See Table 2.1	14/14	See Table 2.1	29500	2,000	2.3E+003			NO	NUT
7439921	Lead	3.9	J	2670		mg/kg	See Table 2.1	13/13	See Table 2.1	2670	400	4.0E+002			YES	ASL
7439954	Magnesium	81.8	B	2240		mg/kg	See Table 2.1	14/14	See Table 2.1	2240	5,000				NO	NUT
7439965	Manganese	1.8	B	274		mg/kg	See Table 2.1	13/13	See Table 2.1	274	5,000	1.6E+002			NO	BKG
7439976	Mercury	0.13		0.36		mg/kg	See Table 2.1	7/14	See Table 2.1	0.36	0.1	7.8E-001			NO	BSL
7440020	Nickel	3.7	B	240	JN	mg/kg	See Table 2.1	14/14	See Table 2.1	240	13	1.6E+002			YES	ASL
7440097	Potassium	132	B2	560	B	mg/kg	See Table 2.1	14/14	See Table 2.1	560	43000				NO	NUT
7782492	Selenium	1.1	BJN	3	J	mg/kg	See Table 2.1	4/11	See Table 2.1	3	2	3.9E+001			NO	BSL
7440224	Silver	1.2	B2	9.6	J	mg/kg	See Table 2.1	3/14	See Table 2.1	9.6		3.9E+001			NO	BSL
7440235	Sodium	28	B2J	427	J	mg/kg	See Table 2.1	14/14	See Table 2.1	427	8000				NO	NUT
7440280	Thallium	0.6	BWJ	1.1	B	mg/kg	See Table 2.1	4/14	See Table 2.1	1.1		5.5E-001			YES	ASL
7440622	Vanadium	8.7	B	63.6	B	mg/kg	See Table 2.1	14/14	See Table 2.1	63.6	150	5.5E+001			NO	BKG
7440666	Zinc	9.1	J	7500		mg/kg	See Table 2.1	13/13	See Table 2.1	7500	20	2.3E+003			YES	ASL
72559	4,4'-DDE	0.027	P	0.027	P	mg/kg	See Table 2.1	1/3	See Table 2.1	0.027		1.9E+000			NO	BSL
50293	4,4'-DDT	0.25	JP	0.25	JP	mg/kg	See Table 2.1	1/3	See Table 2.1	0.25		1.9E+000			NO	BSL
11097691	Aroclor 1254	0.15	J	0.99	JN	mg/kg	See Table 2.1	2/4	See Table 2.1	0.99		1.6E-001			YES	ASL
11096825	Aroclor 1260	0.44	JN	0.44	JN	mg/kg	See Table 2.1	1/4	See Table 2.1	0.44		3.2E-001			YES	ASL
319857	beta-BHC	0.0071	JN	0.0071	JN	mg/kg	See Table 2.1	1/4	See Table 2.1	0.0071		3.5E-001			NO	BSL
33213659	Endosulfanil	0.0015	J	0.017	JN	mg/kg	See Table 2.1	2/4	See Table 2.1	0.017		4.7E+001			NO	BSL
72208	Endrin	0.0031	J	0.048	JP	mg/kg	See Table 2.1	2/4	See Table 2.1	0.048		2.3E+000			NO	BSL
53494705	Endrin ketone	0.00011	J	0.019	J	mg/kg	See Table 2.1	2/4	See Table 2.1	0.019		2.3E+000			NO	BSL
95501	1,2-Dichlorobenzene	0.084	J	0.084	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.084		7.0E+002			NO	BSL

TABLE 2 (Page 2)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Western Parcel
SITE NAME: Liberty Industrial Finiashing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
91576	2-Methylnaphthalene	0.04	J	0.69	J	mg/kg	See Table 2.1	3/4	See Table 2.1	0.69		1.6E+002			NO	BSL
120127	Anthracene	0.045	J	0.15	J	mg/kg	See Table 2.1	2/4	See Table 2.1	0.15		2.3E+003			NO	BSL
205992	Benzo[b]fluoranthene	0.005	J	0.005	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.005		8.7E-001			NO	BSL
117817	bis[2-ethylhexyl]phthalate	0.39	J	0.39	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.39		4.6E+001			NO	BSL
84742	Di-N-butlyphthalate	0.029	J	0.069	J	mg/kg	See Table 2.1	2/4	See Table 2.1	0.069		7.8E+002			NO	BSL
117840	Di-N-octylphthalate	0.081	J	0.081	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.081		1.6E+002			NO	BSL
132649	Dibenzofuran	0.043	J	0.043	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.043		3.1E+001			NO	BSL
206440	Fluoranthene	0.006	J	0.006	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.006		3.1E+002			NO	BSL
91203	Naphthalene	0.022	J	0.12	J	mg/kg	See Table 2.1	2/4	See Table 2.1	0.12		1.6E+002			NO	BSL
85018	Phenanthrene	0.005	J	0.005	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.005		2.3E+002			NO	BSL
129000	Pyrene	0.005	J	0.005	J	mg/kg	See Table 2.1	1/4	See Table 2.1	0.005		2.3E+002			NO	BSL
71556	1,1,1-Trichloroethane	0.005	J	0.011	J	mg/kg	See Table 2.1	2/22	See Table 2.1	0.011		1.6E+002			NO	BSL
75343	1,1-Dichloroethane	0.004	J	0.004	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.004		7.8E+002			NO	IFD
107062	1,2-Dichloroethane	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		7.0E+000			NO	IFD
540590	1,2-Dichloroethene (f)	0.005	J	15	J	mg/kg	See Table 2.1	4/24	See Table 2.1	15		7.0E+001			NO	BSL
78875	1,2-Dichloropropane	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		9.4E+000			NO	IFD
78933	2-Butanone	0.002	J	0.036	D	mg/kg	See Table 2.1	4/13	See Table 2.1	0.036		4.7E+003			NO	BSL
591786	2-Hexanone	0.37	J	0.37	J	mg/kg	See Table 2.1	1/13	See Table 2.1	0.37		3.1E+002			NO	BSL
108101	4-Methyl-2-Pentanone	0.046	J	0.046	J	mg/kg	See Table 2.1	1/13	See Table 2.1	0.046		6.3E+002			NO	BSL
67641	Acetone	0.039		0.62	J	mg/kg	See Table 2.1	4/13	See Table 2.1	0.62		7.8E+002			NO	BSL
75274	Bromodichloromethane	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		1.0E+001			NO	IFD
56236	Carbon Tetrachloride	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		4.9E+000			NO	IFD
108907	Chlorobenzene	0.001	J	0.006	J	mg/kg	See Table 2.1	2/22	See Table 2.1	0.006		1.6E+002			NO	BSL
67663	Chloroform	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		7.8E+001			NO	IFD
10061015	cis-1,3-Dichloropropene	0.063	J	0.063	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.063		2.4E+000			NO	IFD
100414	Ethylbenzene	0.002	J	0.57	J	mg/kg	See Table 2.1	3/21	See Table 2.1	0.57		7.8E+002			NO	BSL
75092	Methylene Chloride	0.002	J	0.068	J	mg/kg	See Table 2.1	2/22	See Table 2.1	0.066		8.5E+001			NO	BSL
100425	Styrene	0.004	J	0.004	J	mg/kg	See Table 2.1	1/13	See Table 2.1	0.004		1.6E+003			NO	BSL
127184	Tetrachloroethene	0.001		15	J	mg/kg	See Table 2.1	8/24	See Table 2.1	15		1.2E+001			YES	ASL
108883	Toluene	0.001	J	6.7	J	mg/kg	See Table 2.1	5/21	See Table 2.1	6.7		1.6E+003			NO	BSL
79016	Trichloroethene	0.001		6.3	J	mg/kg	See Table 2.1	14/25	See Table 2.1	6.3		4.7E+001			NO	BSL
75014	Vinyl Chloride	0.14	J	0.14	J	mg/kg	See Table 2.1	1/22	See Table 2.1	0.14		3.4E-001			NO	IFD
1330207	Xylenes	0.008	JD	13	J	mg/kg	See Table 2.1	4/41	See Table 2.1	13		1.6E+004			NO	BSL

(1) Minimum maximum detected concentration
(2) N/A - Refer to supporting information for background discussion.

Definitions
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern

(3) Based on USEPA Region lll Risk-Based Concentrations for residential soil (10/99)

(4) Rationale Codes

Selection Reason:
- Infrequent Detection but Associated Historically (HIST)
- Frequent Detection (FD)
- Toxicity Information Available (TX)
- Above Screening Levels (ASL)

Deletion Reason:
- Infrequent Detection (IFD)
- Below Background Levels (BKG)
- No Toxicity Information (NTX)
- Essential Nutrient (NUT)
- Below Screening Level (BSL)

See Table 2.1 In the Baseline Human Health Risk Assessment.

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

MCL = Federal Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level

J = Estimated Value

C = Carcinogenic

N= Non-Carcinogenc

TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - Western Parcel

SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data*	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cyanide	mg/kg	4.88E+001	1.15E+003	2.43E+002	See Table 2.1-2.4	mg/kg	2.43E+002	Max	S-W	2.43E+002	Max	S-W
Aluminum	mg/kg	1.60E+004	3.18E+004	1.30E+005	See Table 2.1-2.4	mg/kg	4.02E+004	95% UCL - T	S-W	4.02E+004	95% UCL - T	S-W
Antimony	mg/kg	1.51E+001	3.29E+001	1.45E+002	See Table 2.1-2.4	mg/kg	4.25E+001	95% UCL - T	S-W	4.25E+001	95% UCL - T	S-W
Arsenic	mg/kg	8.61E+000	1.23E+001	2.60E+001	See Table 2.1-2.4	mg/kg	1.73E+001	95% UCL - T	S-W	1.73E+001	95% UCL - T	S-W
Cadmium	mg/kg	6.39E+001	1.18E+002	2.51E+003	See Table 2.1-2.4	mg/kg	2.04E+002	95% UCL - T	K-S	2.04E+002	95% UCL - T	K-S
Chromium III	mg/kg	6.33E+002	9.76E+002	1.29E+004	See Table 2.1-2.4	mg/kg	1.61E+003	95% UCL - T	K-S	1.61E+003	95% UCL - T	K-S
Chromium VI	mg/kg	2.11E+002	3.25E+002	4.30E+003	See Table 2.1-2.4	mg/kg	5.36E+002	95% UCL - T	K-S	5.36E+002	95% UCL - T	K-S
Copper	mg/kg	4.33E+002	1.02E+003	4.72E+003	See Table 2.1-2.4	mg/kg	3.35E+003	95% UCL - T	S-W	3.35E+003	95% UCL - T	S-W
Lead	mg/kg	2.71E+002	6.31E+002	2.67E+003	See Table 2.1-2.4	mg/kg	2.71E+002	Mean		2.71E+002	Mean	
Nickel	mg/kg	3.94E+001	9.96E+001	2.40E+002	See Table 2.1-2.4	mg/kg	9.96E+001	95% UCL - T	S-W	9.96E+001	95% UCL - T	S-W
Thallium	mg/kg	4.20E-001	6.30E-001	1.10E+000	See Table 2.1-2.4	mg/kg	6.30E-001	95% UCL - T	S-W	6.30E-001	95% UCL - T	S-W
Zinc	mg/kg	1.22E+003	2.33E+004	7.50E+003	See Table 2.1-2.4	mg/kg	7.50E+003	Max	S-W	7.50E+003	Max	S-W
Aroclor 1254	mg/kg	3.09E-001	NA	9.90E-001	See Table 2.1-2.4	mg/kg	9.90E-001	Max	< 5 Samples	9.90E-001	Max	< 5 Samples
Aroclor 1260	mg/kg	1.39E-001	NA	4.4E-001	See Table 2.1-2.4	mg/kg	4.40E-001	Max	< 5 Samples	4.40E-001	Max	< 5 Samples
Tetrachloroethene	mg/kg	6.32E-001	1.70E+000	1.50E+001	See Table 2.1-2.4	mg/kg	1.54E-001	95% UCL - T	S-W	1.54E-001	95% UCL - T	S-W

EPC = Exposure Point Concentration

NA - Not available becuase of too few samples

Methods for determining means and UCL concentration deteailin in Baseline Risk Assessment

In Calculating EPCs, duplicatwes were averaged prior to statistical analysis/

In Calculating EPCs, 1/2 the detection limit was used for nondetects.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL - N); 95% UCL of Log-Transfromed Data (95% UCL-T); Mean of Log-Transformed DAta (Mean-T); Mean of Normal Data (Mean-T)

Rationale: S-W (Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05); K-S (Kolmogorov-Smirnov with the Lilliefors significance correction was used for smaple sets greater than 50)

Footnotes: If the UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC; if the sample distribution is neither normal nor lognormal, the data were asumed to be lognormal for the p

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS - Western Parcel
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg/day	100	EPA, 1991	50	EPA, 1991	CS x IR x EF x ED x FI x CF x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	24	EPA, 1991	12	EPA, 1991	
	CF1	Conversion Factor	kg/mg	0.000001		0.000001		
	FI	Fraction Ingested	unitless	1		1		
	BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	4,380	EPA, 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Dermall Absorbed Dose (mg/kg-day) =
	CF	Converstin Factor	kg/mg	0.000001	EPA, 1991	0.000001	EPA, 1991	CSxAF xABSxSAxEDxEFxCFx1/BWx1/AT
	SA	Skin Surface Area	cm2	14600	3	8090	4	
	AF	Dermal Adherence Factor	mg/cm2	0.07	5	0.01	5	
	ABS	Dermal Absorption Factor	unitless	Chem. Spec.	6	Chem. Spec.	6	
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	24	EPA, 1991	12	EPA, 1991	
	BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,960	EPA, 1989	4,380	EPA, 1989	

1 Based on 7 times per week for the 13 summer weeks, 4 times per week for the 26 spring and fall weeks, and 2 times per week for the 13 winter weeks

2 Based on 5 times per week for the 13 summer weeks, 3 times per week for the 26 spring and fall weeks, and 1 time per week for the 13 winter weeks

3 Based on EPA, 1997; Value is the 50th percentile value for men and women, based on head, trunk, upper extremeties, lower legs, and feet

4 Based on EPA, 1997; Value is the 50th percentile value for men and women, based on head, upper extremeties, tower legs, and feet

5 Dermal adherence factors are from the draft dermal guidance

6 Dermal absorption factors are: Arsenic (0.03), Cadmium (0.001), and PCBs (0.14)

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS - Western Parcel

SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Recreational User
Receptor Age: Adolescent (6-18 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg/day	100	EPA, 1991	50	EPA, 1991	CS x IR x EF x ED x FI x CF x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	12		12		
	CF1	Conversion Factor	kg/mg	0.000001		0.000001		
	FI	Fraction Ingested	unitless	1		1		
	BW	Body Weight	kg	45	EPA, 1997	45	EPA, 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Dermall Absorbed Dose (mg/kg-day) =
	CF	Converstin Factor	kg/mg	0.000001	EPA, 1991	0.000001	EPA, 1991	CSxAF xABSxSAxEDxEFxCFx1/BWx1/AT
	SA	Skin Surface Area	cm2	9825	3	6550	4	
	AF	Dermal Adherence Factor	mg/cm2	0.07	5	0.01	5	
	ABS	Dermal Absorption Factor	unitless	Chem. Spec.	6	Chem. Spec.	6	
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	12		12		
	BW	Body Weight	kg	45	EPA, 1987	45	EPA, 1987	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

1 Based on 7 times per week for the 13 summer weeks, 4 times per week for the 26 spring and fall weeks, and 2 times per week for the 13 winter weeks.

2 Based on 5 times per week for the 13 summer weeks, 3 times per week for the 26 spring and fall weeks, and 1 time per week for the 13 winter weeks.

3 Based on EPA, 1997; Value is the 50th percentile value total body surface area for boys and girls, ages 6 -18 years. The RME value is 75% of the total skin surface area

4 Based on EPA, 1997; Value is the 50th percentile value total body surface area for boys and girls, ages 6 -18 years. The RME value is 50% of the total skin surface area

5 Dermal adherence factors are from the draft dermal guidance.

6 Dermal absorption factors are: Arsenic (0.03), Cadmium (0.001), and PCBs (0.14).

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS - Western Parcel
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Recreational User
Receptor Age: Child (< 6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR x EF x ED x FI x CF x 1/BW x 1/AT
	IR	Ingestion Rate of Soil	mg/day	200	EPA, 1991	100	EPA, 1991	
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
	CF1	Conversion Factor	kg/mg	0.000001		0.000001		
	FI	Fraction Ingested	unitless	1		1		
	BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	2,190	EPA, 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3.1	EPA, 1989	See Table 3.1	EPA, 1989	Dermall Absorbed Dose (mg/kg-day) = CSxAF xABSxSAxEDxEFxCFx1/BWx1/AT
	CF	Converstin Factor	kg/mg	0.000001	EPA, 1991	0.000001	EPA, 1991	
	SA	Skin Surface Area	cm2	5160	3	3440	4	
	AF	Dermal Adherence Factor	mg/cm2	0.2	5	0.06	5	
	ABS	Dermal Absorption Factor	unitless	Chem. Spec.	6	Chem. Spec.	6	
	EF	Exposure Frequency	days/year	221	1	156	2	
	ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
	BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	9,125	EPA, 1989	

1 Based on 7 times per week for the 13 summer weeks, 4 times per week for the 26 spring and fall weeks, and 2 times per week for the 13 winter weeks.
2 Based on 5 times per week for the 13 summer weeks, 3 times per week for the 26 spring and fall weeks, and 1 time per week for the 13 winter weeks.
3 Based on EPA, 1997; Value is the 50th percentile value total body surface area for boys and girls, ages 2 - 6 years. The RME value is 75% of the total skin surface area
4 Based on EPA, 1997; Value is the 50th percentile value total body surface area for boys and girls, ages 2 - 6 years. The RME value is 50% of the total skin surface area
5 Dermal adherence factors are from the draft dermal guidance
6 Dermal absorption factors are: Arsenic (0.03), Cadmium (0.001), and PCSs (0.14).

TABLE 5
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITE NAME: Liberty Industrial Finishing Site

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Adjusted Dermal RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD (3) Target Organ (MM/DD/YY)
Cyanide	Chronic	2.00E-002	mg/kg-day	2.00E-002	mg/kg-day	NA	20	IRIS	05/22/00
Aluminum	Chronic	1.00E+000	mg/kg-day	NA	mg/kg-day	CNS	100	NCEA	08/13/99
Antimony	Chronic	4.00E-004	mg/kg-day	6.00E-005	mg/kg-day	Blood	1,000	IRIS	03/14/99
Arsenic	Chronic	3.00E-004	mg/kg-day	3.00E-004	mg/kg-day	Skin	3	IRIS	03/14/99
Cadmium	Chronic	5.00E-004	mg/kg-day	1.25E-005	mg/kg-day	Kidney	10	IRIS	03/14/99
Chromium III	Chronic	1.5E+000	mg/kg-day	1.95E-002	mg/kg-day	NOEL	1,000	IRIS	03/22/99
Chromium VI	Chronic	3.00E-003	mg/kg-day	7.5E-005	mg/kg-day	NOEL	500	IRIS	03/14/99
Copper	Chronic	4.00E-002	mg/kg-day	4.00E-002	mg/kg-day	GI System	NA	HEAST	05/01/95
Lead	Chronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	NA	NA
Nickel	Chronic	2.00E-002	mg/kg-day	8.00E-004	mg/kg-day	NA	3,000	IRIS	07/16/87
Thallium	Chronic	8.00E-005	mg/kg-day	8.00E-005	mg/kg-day	Liver, Blood	NA	IRIS	10/01/98
Zinc	Chronic	3.00E-001	mg/kg-day	3E-001	mg/kg-day	Blood	3	IRIS	03/14/99
Aroclor 1254	Chronic	5.00E-005	mg/kg-day	5.00E-005	mg/kg-day	Immune System	300	IRIS	03/14/99
Aroclor 1260	Chronic	5.00E-005	mg/kg-day	5.00E-005	mg/kg-day	Immune System	300	IRIS	03/14/99
Tetrachloroethene	Chronic	1.00E-002	mg/kg-day	1.00E-002	mg/kg-day	Liver	1000	IRIS	03/14/99

N/A = Not Applicable
(1) Refer to RAGS Part A.
(2) Provide equation used for derivation.
(3) For IRIS values, provide the date IRIA was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA

TABLE 6
CANCER TOXICITY DATA - - ORAL/DERMAL
SITE NAME: Liberty Industrial Finishing Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Cyanide	NA	NA	NA	(mg/kg-day)-1	D	IRIS	05/23/00
Aluminum	NA	NA	NA	(mg/kg-day)-1	D	NCEA	06/20/97
Antimony	NA	NA	NA	(mg/kg-day)-1	NA	NA	03/14/99
Arsenic	1.5	1E+000	1.5	(mg/kg-day)-1	A	IRIS	03/14/99
Cadmium	NA	NA	NA	(mg/kg-day)-1	B1(Inh Only)	IRIS	03/14/99
Chromium III	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Chromium VI	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Copper	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Lead	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Nickel	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Thallium	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Zinc	NA	NA	NA	(mg/kg-day)-1	NA	NA	N/A
Aroclor 1254	2.0	1E+000	2E+000	(mg/kg-day)-1	B2	IRIS	05/23/00
Aroclor 1260	2.0	1E+000	2E+000	(mg/kg-day)-1	B2	IRIS	05/23/00
Tetrachloroethene	5.2E-002	1E+000	5E-002	(mg/kg-day)-1	C-B2	NCEA	N/A

IRIS = Integrated Risk Information System
HEAST= Heath Effects Assessment Summary Tables

(1) Provide equation of derivation in text.
(2) For IRIS values, provide the date IRIS was searched.
For Heast values, provide the date of Heast.
For NCEA values, provide the date of article provided by NCEA.

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 and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Weight of Evidence:
Known/Likely
Cannot be Determined
Not Likely

TABLE 7.1 (PAGE 1)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Adults
Receptor Age: 18 and up

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R	2.1E-004	mg/kg-day	2.00E-002	mg/kg-day			1.1E-s002
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R	3.5E-002	mg/kg-day	1.00E+000	mg/kg-day			3.5E-002
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R	3.7E-005	mg/kg-day	4.00E-004	mg/kg-day			9.2E-002
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	1.5E-005	mg/kg-day	3.00E-004	mg/kg-day			5.0E-002
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	1.8E-004	mg/kg-day	5.00E-004	mg/kg-day			3.5E-001
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R	1.4E-003	mg/kg-day	1.5E+000	mg/kg-day			9.3E-004
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R	4.6E-004	mg/kg-day	3.00E-003	mg/kg-day			1.5E-001
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R	2.9E-003	mg/kg-day	4.00E-002	mg/kg-day			7.2E-002
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R	2.3E-004	mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R	8.6E-005	mg/kg-day	2.00E-002	mg/kg-day			4.3E-003
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R	5.4E-007	mg/kg-day	8.00E-005	mg/kg-day			6.8E-003
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R	6.5E-003	mg/kg-day	3.00E-001	mg/kg-day			2.2E-002
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	8.6E-007	mg/kg-day	5.00E-005	mg/kg-day			1.7E-002
	Arclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	3.8E-007	mg/kg-day	5.00E-005	mg/kg-day			7.6E-003
	Tetracloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	1.3E-007	mg/kg-day	1.00E-002	mg/kg-day			1.3E-005
												Total Hazard Index Across All Exposure Routes/Pathways	8.3E-001

R = Route EPC
Total Hazard Index is broken down by target organ in other tables.

TABLE 7.1 (PAGE 2)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Adults
Receptor Age: 18 and up

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		mg/kg-day	2.00E-002	mg/kg-day			NA
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		mg/kg-day	6.00E-005	mg/kg-day			NA
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	4.6E-006	mg/kg-day	3.00E-004	mg/kg-day			1.5E-002
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	1.8E-006	mg/kg-day	1.25E-005	mg/kg-day			1.4E-001
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		mg/kg-day	1.95E-002	mg/kg-day			NA
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		mg/kg-day	7.5E-005	mg/kg-day			NA
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		mg/kg-day	4.00E-002	mg/kg-day			NA
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		mg/kg-day	8.00E-004	mg/kg-day			NA
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		mg/kg-day	8.00E-005	mg/kg-day			NA
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		mg/kg-day	3E-001	mg/kg-day			NA
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	1.2E-006	mg/kg-day	5.00E-005	mg/kg-day			2.5E-002
	Arclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	5.4E-007	mg/kg-day	5.00E-005	mg/kg-day			1.1E-002
	Tetracloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R		mg/kg-day	1.00E-002	mg/kg-day			NA
												Total Hazard Index Across All Exposure Routes/Pathways	1.9E-001

R = Route EPC
Total Hazard Index is broken down by target organ in other tables.
Due to a lack of dermal absorption values, dermally absorbed doses could not be estimated for the other chemicals.

TABLE 7.2 (PAGE 1)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME- Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Adolescent
Receptor Age: 6 - 18 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R	3.3E-004	mg/kg-day	2.00E-002	mg/kg-day			1.6E-002
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R	5.4E-002	mg/kg-day	1.00E+000	mg/kg-day			5.4E-002
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R	5.7E-005	mg/kg-day	4.00E-004	mg/kg-day			1.4E-001
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	2.3E-005	mg/kg-day	3.00E-004	mg/kg-day			7.8E-002
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	2.7E-004	mg/kg-day	5.00E-004	mg/kg-day			5.5E-001
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R	2.2E-003	mg/kg-day	1.5E+000	mg/kg-day			1.4E-003
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R	7.2E-004	mg/kg-day	3.00E-003	mg/kg-day			2.4E-001
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R	4.5E-003	mg/kg-day	4.00E-002	mg/kg-day			1.1E-001
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R	3.6E-004	mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R	1.3E-004	mg/kg-day	2.00E-002	mg/kg-day			6.7E-003
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R	8.5E-007	mg/kg-day	8.00E-005	mg/kg-day			1.1E-002
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R	1.0E-002	mg/kg-day	3.00E-001	mg/kg-day			3.4E-002
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	1.3E-006	mg/kg-day	5.00E-005	mg/kg-day			2.7E-002
	Arclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	5.9E-007	mg/kg-day	5.00E-005	mg/kg-day			1.2E-002
	Tetracloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	2.1E-007	mg/kg-day	1.00E-002	mg/kg-day			2.1E-005
Total Hazard Index Across All Exposure Routes/Pathways													1.3E+000

R = Route EPC
Total Hazard Index is broken down by target organ in other tables

TABLE 7.2 (PAGE 2)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Adolescent
Receptor Age: 6 - 18 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		mg/kg-day	2.00E-002	mg/kg-day			NA
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		mg/kg-day	6.00E-005	mg/kg-day			NA
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	4.9E-006	mg/kg-day	3.00E-004	mg/kg-day			1.6E-002
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	1.9E-006	mg/kg-day	1.25E-005	mg/kg-day			1.6E-001
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		mg/kg-day	1.95E-002	mg/kg-day			NA
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		mg/kg-day	7.5E-005	mg/kg-day			NA
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		mg/kg-day	4.00E-002	mg/kg-day			NA
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		mg/kg-day	8.00E-004	mg/kg-day			NA
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		mg/kg-day	8.00E-005	mg/kg-day			NA
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		mg/kg-day	3E-001	mg/kg-day			NA
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	1.3E-006	mg/kg-day	5.00E-005	mg/kg-day			2.6E-002
	Arclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	5.9E-007	mg/kg-day	5.00E-005	mg/kg-day			1.2E-002
	Tetracloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R		mg/kg-day	1.00E-002	mg/kg-day			NA
												Total Hazard Index Across All Exposure Routes/Pathways	2.1E-001

R = Route EPC
Total Hazard Index is broken down by target organ in other tables.
Due to a lack of dermal absorption values, dermally absorbed doses could not be estimated for the other chemicals.

TABLE 7.3 (PAGE 1)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Child
Receptor Age: < 6 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R	2.0E-003	mg/kg-day	2.00E-002	mg/kg-day			9.8E-002
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R	3.2E-001	mg/kg-day	1.00E+000	mg/kg-day			3.2E-001
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R	3.4E-004	mg/kg-day	4.00E-004	mg/kg-day			8.6E-001
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	1.4E-004	mg/kg-day	3.00E-004	mg/kg-day			4.7E-001
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	1.6E-003	mg/kg-day	5.00E-004	mg/kg-day			3.3E+000
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R	1.3E-002	mg/kg-day	1.5E+000	mg/kg-day			8.7E-003
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R	4.3E-003	mg/kg-day	3.00E-003	mg/kg-day			1.4E+000
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R	2.7E-002	mg/kg-day	4.00E-002	mg/kg-day			6.8E-001
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R	2.2E-003	mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R	8.0E-004	mg/kg-day	2.00E-002	mg/kg-day			4.0E-002
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R	5.1E-006	mg/kg-day	8.00E-005	mg/kg-day			6.4E-002
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R	6.1E-002	mg/kg-day	3.00E-001	mg/kg-day			2.0E-001
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	8.0E-006	mg/kg-day	5.00E-005	mg/kg-day			1.6E-001
	Arclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	3.6E-006	mg/kg-day	5.00E-005	mg/kg-day			7.1E-002
	Tetracloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	1.2E-006	mg/kg-day	1.00E-002	mg/kg-day			1.2E-004
												Total Hazard Index Across All Exposure Routes/Pathways	7.7E+000

R = Route EPC
Total Hazard Index is broken down by target organ in other tables.

TABLE 7.3 (PAGE 2)
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Child
Receptor Age: < 6 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		mg/kg-day	2.00E-002	mg/kg-day			NA
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		mg/kg-day	6.00E-005	mg/kg-day			NA
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	2.2E-005	mg/kg-day	3.00E-004	mg/kg-day			7.2E-002
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R	8.5E-006	mg/kg-day	1.25E-005	mg/kg-day			6.8E-001
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		mg/kg-day	1.95E-002	mg/kg-day			NA
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		mg/kg-day	7.5E-005	mg/kg-day			NA
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		mg/kg-day	4.00E-002	mg/kg-day			NA
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		mg/kg-day	NA	mg/kg-day			NA
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		mg/kg-day	8.00E-004	mg/kg-day			NA
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		mg/kg-day	8.00E-005	mg/kg-day			NA
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		mg/kg-day	3E-001	mg/kg-day			NA
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	5.8E-006	mg/kg-day	5.00E-005	mg/kg-day			1.2E-001
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	2.6E-006	mg/kg-day	5.00E-005	mg/kg-day			5.1E-002
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R		mg/kg-day	1.00E-002	mg/kg-day			NA
												Total Hazard Index Across All Exposure Routes/Pathways	9.2E-001

R = Route EPC
Total Hazard Index is broken down by target organ in other tables.
Due to a lack of dermal absorption values, dermally absorbed doses could not be estimated for the other chemicals

TABLE 8.1 (PAGE 1)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Adults
Receptor Age: 18 and up

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	5.1E-006	(mg/kg-day)–1	1.5	(mg/kg-day)–1	7.70E-006
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	2.9E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	5.87E-007
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	1.3E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	2.61E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	4.6E-008	(mg/kg-day)–1	5.2E-002	(mg/kg-day)–1	2.37E-009
										Total Risk Across All Exposure Routes/Pathways	8.5E-006

R = Route EPC

TABLE 8.1 (PAGE 2)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Adults
Receptor Age: 18 and up

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	1.6E-006	(mg/kg-day)–1	1.5	(mg/kg-day)–1	2.36E-006
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	3.0E-009	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	6.00E-009
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	1.9E-007	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	3.73E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	6.5E-008	(mg/kg-day)–1	5E-002	(mg/kg-day)–1	3.40E-009
										Total Risk Across All Exposure Routes/Pathways	2.7E-006

R = Route EPC

TABLE 8.2 (PAGE 1)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Adolescent
Receptor Age: 6 - 18 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	4.0E-006	(mg/kg-day)–1	1.5	(mg/kg-day)–1	5.99E-006
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	2.3E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	4.57E-007
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	1.0E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	2.03E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	3.6E-008	(mg/kg-day)–1	5.2E-002	(mg/kg-day)–1	1.85E-009
										Total Risk Across All Exposure Routes/Pathways	6.6E-006

R = Route EPC

TABLE 8.2 (PAGE 2)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Adolescents
Receptor Age: 6 - 18 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	8.2E-007	(mg/kg-day)–1	1.5	(mg/kg-day)–1	1.24E-006
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	1.6E-009	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	3.14E-009
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	9.8E-008	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	1.95E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	3.4E-008	(mg/kg-day)–1	5E-002	(mg/kg-day)–1	1.78E-007
										Total Risk Across All Exposure Routes/Pathways	1.4E-006

R = Route EPC

TABLE 8.3 (PAGE 1)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Child
Receptor Age: < 6 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	1.2E-005	(mg/kg-day)–1	1.5	(mg/kg-day)–1	1.80E-005
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	6.9E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	1.37E-006
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	3.0E-007	(mg/kg-day)–1	2.0	(mg/kg-day)–1	6.09E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	1.1E-007	(mg/kg-day)–1	5.2E-002	(mg/kg-day)–1	5.54E-009
										Total Risk Across All Exposure Routes/Pathways	2.0E-005

R = Route EPC

TABLE 8.3 (PAGE 2)
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Resident: Western Parcel
Receptor Population: Child
Receptor Age: < 6 Years

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Cyanide	2.43E+002	mg/kg	2.43E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aluminum	4.02E+004	mg/kg	4.02E+004	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Antimony	4.25E+001	mg/kg	4.25E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Arsenic	1.73E+001	mg/kg	1.73E+001	mg/kg	R	1.9E-006	(mg/kg-day)–1	1.5	(mg/kg-day)–1	2.78E-006
	Cadmium	2.04E+002	mg/kg	2.04E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium III	1.61E+003	mg/kg	1.61E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Chromium VI	5.36E+002	mg/kg	5.36E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Copper	3.35E+003	mg/kg	3.35E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Lead	2.71E+002	mg/kg	2.71E+002	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Nickel	9.96E+001	mg/kg	9.96E+001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Thallium	6.30E-001	mg/kg	6.30E-001	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Zinc	7.50E+003	mg/kg	7.50E+003	mg/kg	R		(mg/kg-day)–1	NA	(mg/kg-day)–1	
	Aroclor 1254	9.90E-001	mg/kg	9.90E-001	mg/kg	R	3.5E-009	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	7.07E–009
	Aroclor 1260	4.40E-001	mg/kg	4.40E-001	mg/kg	R	2.2E-007	(mg/kg-day)–1	2E+000	(mg/kg-day)–1	4.40E-007
	Tetrachloroethene	1.54E-001	mg/kg	1.54E-001	mg/kg	R	7.7E-008	(mg/kg-day)–1	5.E-002	(mg/kg-day)–1	4.00E-009
										Total Risk Across All Exposure Routes/Pathways	3.2E-006

R = Route EPC

TABLE 9.1RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Receptor Population: Recreational Adult
Receptor Age: 18 and up

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Western Parcel	Cyanide					Cyanide	NA	1.1E-002			1.1E-002
			Aluminum					Aluminum	CNS	3.5E-002			3.5E-002
			Antimony					Antimony	Blood	9.2E-002			9.2E-002
			Arsenic	7.7E-006		2.4E-006	1.01E-005	Arsenic	Skin	5.0E-002		1.5E-002	6.5E-002
			Cadmium					Cadmium	Kidney	3.5E-001		1.4E-001	4.9E-001
			Chromium III					Chromium III	NOEL	9.3E-004			9.3E-004
			Chromium VI					Chromium VI	NOEL	1.5E-001			1.5E-001
			Copper					Copper	GI System	7.2E-002			7.2E-002
			Lead					Lead	NA	NA			0.0E+000
			Nickel					Nickel	NA	4.3E-003			4.3E-003
			Thallium					Thallium	Liver, Blood	6.8E-003			6.8E-003
			Zinc					Zinc	Blood	2.2E-002			2.2E-002
			Aroclor 1254	5.9E-007		6.00E-009	6.0E-007	Aroclor 1254	Immune Sys	1.7E-002		2.5E-002	4.2E-002
			Aroclor 1260	2.6E-007		3.7E-007	6.3E-007	Aroclor 1260	Immune Sys	7.6E-003		1.1E-002	1.9E-002
			Tetrachloroethene	2.4E-009		3.4E-009	5.8E-009	Tetrachloroethene	Liver	1.3E-003			1.3E-003
			(total)	8.6E-006		2.8E-006	1.1E-005	(total)		8.2E-001		1.9E-001	1.0E+000
						Total Risk Across Soil	1.1E-005	Total Hazard Index Across All Media and All Exposure Routes					1.0E+000

Total [Blood] HI =	1.3E-001
Total [Skin] HI =	6.5E-002
Total [Liver] HI =	8.1E-003
Total [CNS] HI =	3.5E-002
Total [NOEL] HI =	1.5E-001
Total [Kidney] HI =	4.9E-001
Total [GI] HI =	7.2E-002
Total [Immune] HI =	5.1E-002

03/18/02

TABLE 9.2RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Receptor Population: Recreational Adolescent
Receptor Age: 6 - 18 Years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Western Parcel	Cyanide					Cyanide	NA	1.6E-002			1.6E-002
			Aluminum					Aluminum	CNS	5.4E-002			5.4E-002
			Antimony					Antimony	Blood	1.4E-001			1.4E-001
			Arsenic	5.99E-006		1.24E-006	7.23E-006	Arsenic	Skin	7.8E-002		1.6E-002	9.4E-002
			Cadmium					Cadmium	Kidney	5.5E-001		1.6E-001	7.1E-001
			Chromium III					Chromium III	NOEL	1.4E-03			1.4E-003
			Chromium VI					Chromium VI	NOEL	2.4E-001			2.4E-001
			Copper					Copper	GI System	1.1E-001			1.1E-001
			Lead					Lead	NA	NA			0.0E+000
			Nickel					Nickel	NA	6.7E-003			6.7E-003
			Thallium					Thallium	Liver, Blood	1.1E-002			1.1E-002
			Zinc					Zinc	Blood	3.4E-002			3.4E-002
			Aroclor 1254	4.6E-007		3.14E-009	4.6E-007	Aroclor 1254	Immune Sys	2.7E-002		2.6E-002	5.3E-002
			Aroclor 1260	2.0E-007		1.95E-007	4.0E-007	Aroclor 1260	Immune Sys	1.2E-002		1.2E-002	2.4E-002
			Tetrachloroethene	1.9E-009		1.78E-009	3.7E-009	Tetrachloroethene	Liver	2.1E-005			2.1E-005
			(total)	6.7E-006		1.4E-006	8.1E-006	(total)		1.3E+000		2.1E-001	1.5E+000

Total Risk Across Soil: 8.1E-006

Total Hazard Index Across All Media and All Exposure Routes: 1.5E+000

Total [Blood] HI = 1.9E-001
Total [Skin] HI = 9.4E-002
Total [Liver] HI = 2.1E-005
Total [CNS] HI = 5.4E-002
Total [NOEL] HI = 2.4E-001
Total [Kidney] HI = 7.1E-001
Total [GI] HI = 1.1E-001
Total [Immune] HI = 7.7E-002

03/18/02

TABLE 9.3RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Receptor Population: Recreational Child
Receptor Age: < 6 Years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Western Parcel	Cyanide					Cyanide	NA	9.8E-002			9.8E-002
			Aluminum					Aluminum	CNS	3.2E-001			3.2E-001
			Antimony					Antimony	Blood	8.6E-001			8.6E-001
			Arsenic	1.8E-005		2.8E-006	2.08E-005	Arsenic	Skin	4.7E-001		7.2E-002	5.4E-001
			Cadmium					Cadmium	Kidney	3.3E+000		6.8E-001	4.0E+000
			Chromium III					Chromium III	NOEL	8.7E-003			8.7E-003
			Chromium VI					Chromium VI	NOEL	1.4E+000			1.4E+000
			Copper					Copper	GI System	6.8E-001			6.8E-001
			Lead					Lead	NA	NA			0.0E+000
			Nickel					Nickel	NA	4.0E-002			4.0E-002
			Thallium					Thallium	Liver, Blood	6.4E-002			6.4E-002
			Zinc					Zinc	Blood	2.0E-001			2.0E-001
			Aroclor 1254	1.4E-007		7.1E-009	1.5E-007	Aroclor 1254	Immune Sys	1.6E-001		1.2E-001	2.8E-001
			Aroclor 1260	6.1E-007		4.4E-007	1.1E-006	Aroclor 1260	Immune Sys	7.1E-002		5.1E-002	1.2E-001
			Tetrachloroethene	5.5E-009		4.00E-009	9.5E-009	Tetrachloroethene	Liver	1.2E-004			1.2E-004
			(total)	1.9E-005		3.3E-006	2.2E-005	(total)		7.7E+000		9.2E-001	8.6E+000
						Total Risk Across Soil	2.2E-005	Total Hazard Index Across All Media and All Exposure Routes					8.6E+000

Total [Blood] HI =	1.0E+000
Total [Skin] HI =	5.4E-001
Total [Liver] HI =	6.4E-002
Total [CNS] HI =	3.2E-001
Total [NOEL] HI =	1.4E+000
Total [Kidney] HI =	4.0E+000
Total [GI] HI =	6.8E-001
Total [Immune] HI =	4.0E-001

03/18/02

TABLE 10.1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SITE NAME: Liberty Industrial Finishing Site

Scenario Timeframe: Future
Receptor Population: Recreational Child
Receptor Age: < 6 Years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Western Parcel	Cadmium					Cadmium	Kidney	3.3E+000		6.8E-001	4.0E+000
			Chromium					Chromium VI	NOEL	1.4E+000			1.4E+000
			Total					Total					

Total Risk Across[Medium]

Total Risk Across All Media and All Exposure Routes

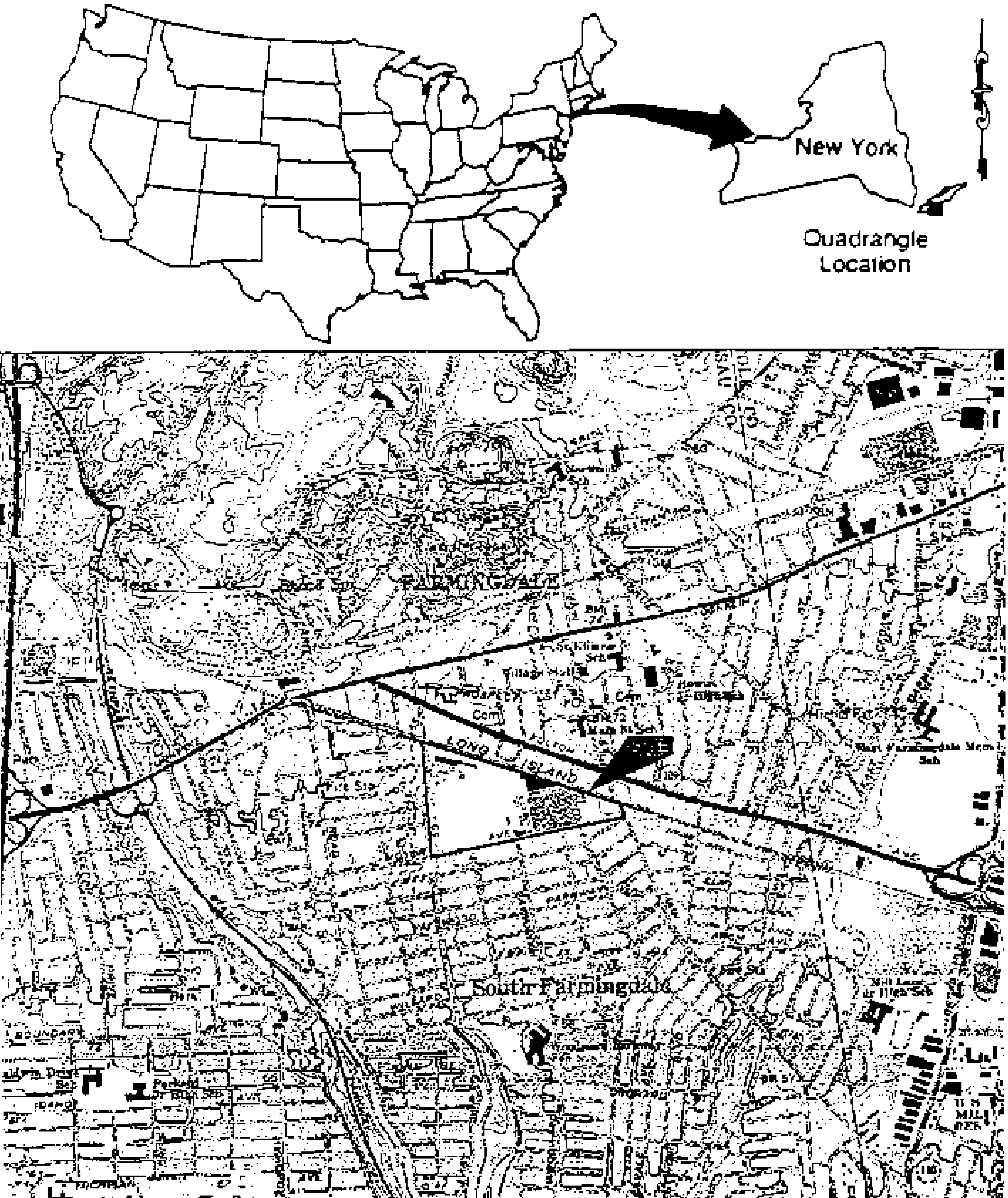
Total Hazard Index Across All Media and All Exposure Routes 5.4E+000

Total [Kidney] HI = 4.0E+000

Total [NOEL] HI = 1.4E+000

APPENDIX II

FIGURES



LEGEND:

GRAPHIC SCALE

1000 0 1000 2000

1 inch = 2000 ft.

SOURCE: UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE SERIES
AMITYVILLE, NY QUADRANGLE 1979

TITLE:

SITE LOCATION MAP

PROJECT:

LIBERTY INDUSTRIAL FINISHING SITE
FARMINGDALE, NEW YORK

CLIENT NAME:

USEPA

WESTON

DATE:

MARCH 2002

FIGURE #:

1-2

0050 | TopomapFig1

FIGURE 1 - SITE LOCATION MAP

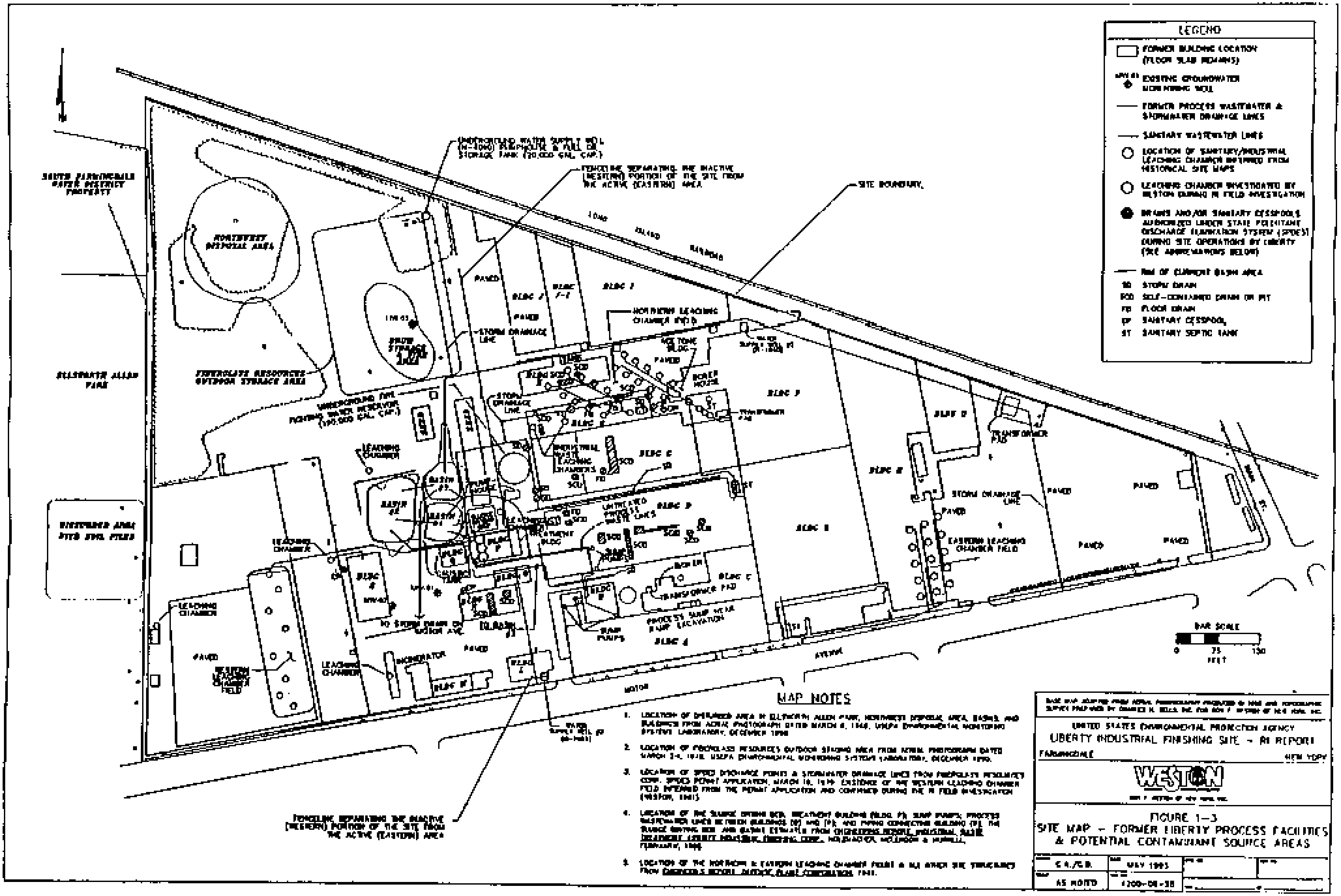


FIGURE 2 - LIBERTY INDUSTRIAL FINISHING PLAN

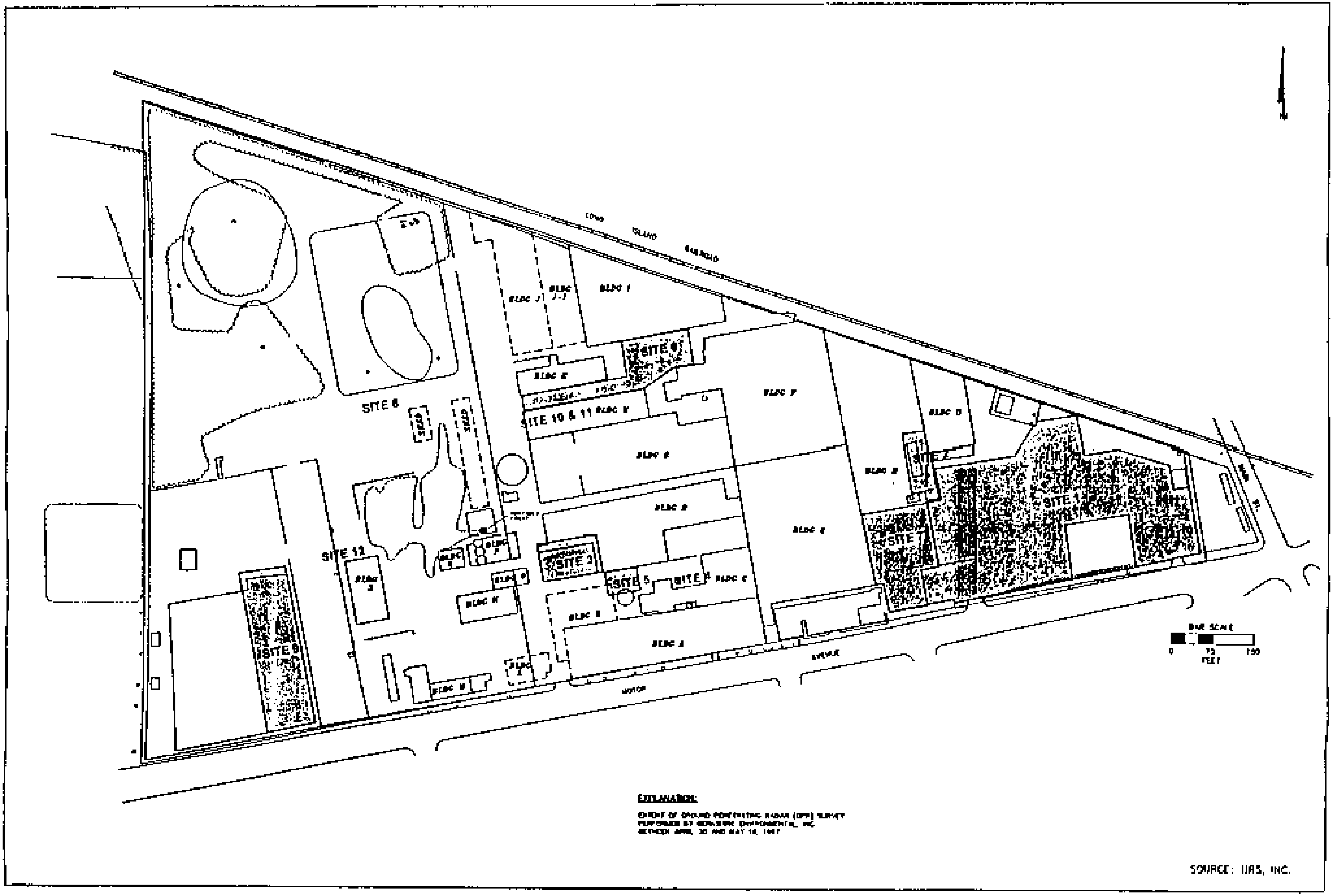


FIGURE 3 - GEOPHYSICAL SURVEY SITES

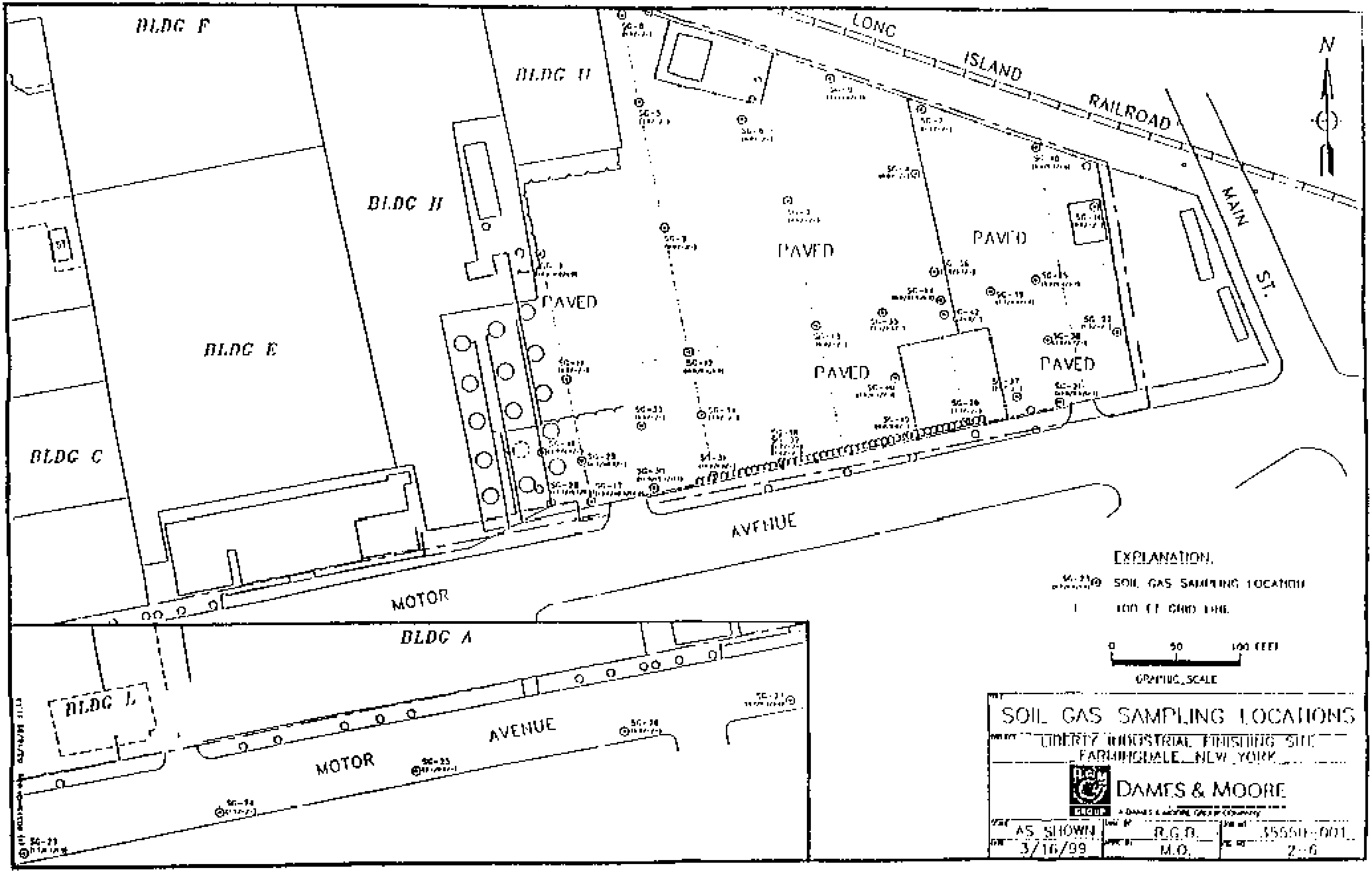


FIGURE 4 - SOIL GAS SAMPLING LOCATIONS

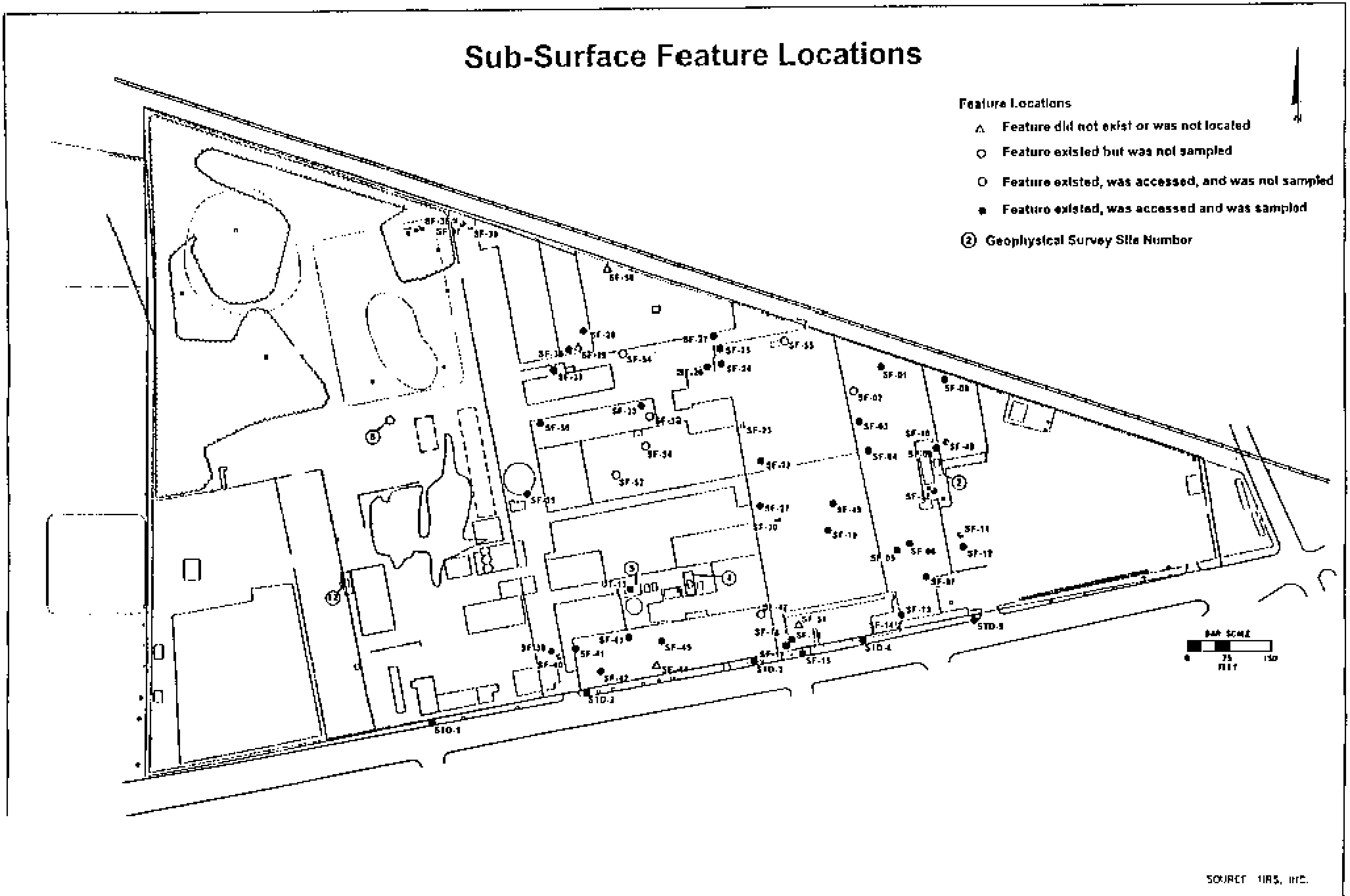


FIGURE 5 - SUBSURFACE FEATURE LOCATIONS

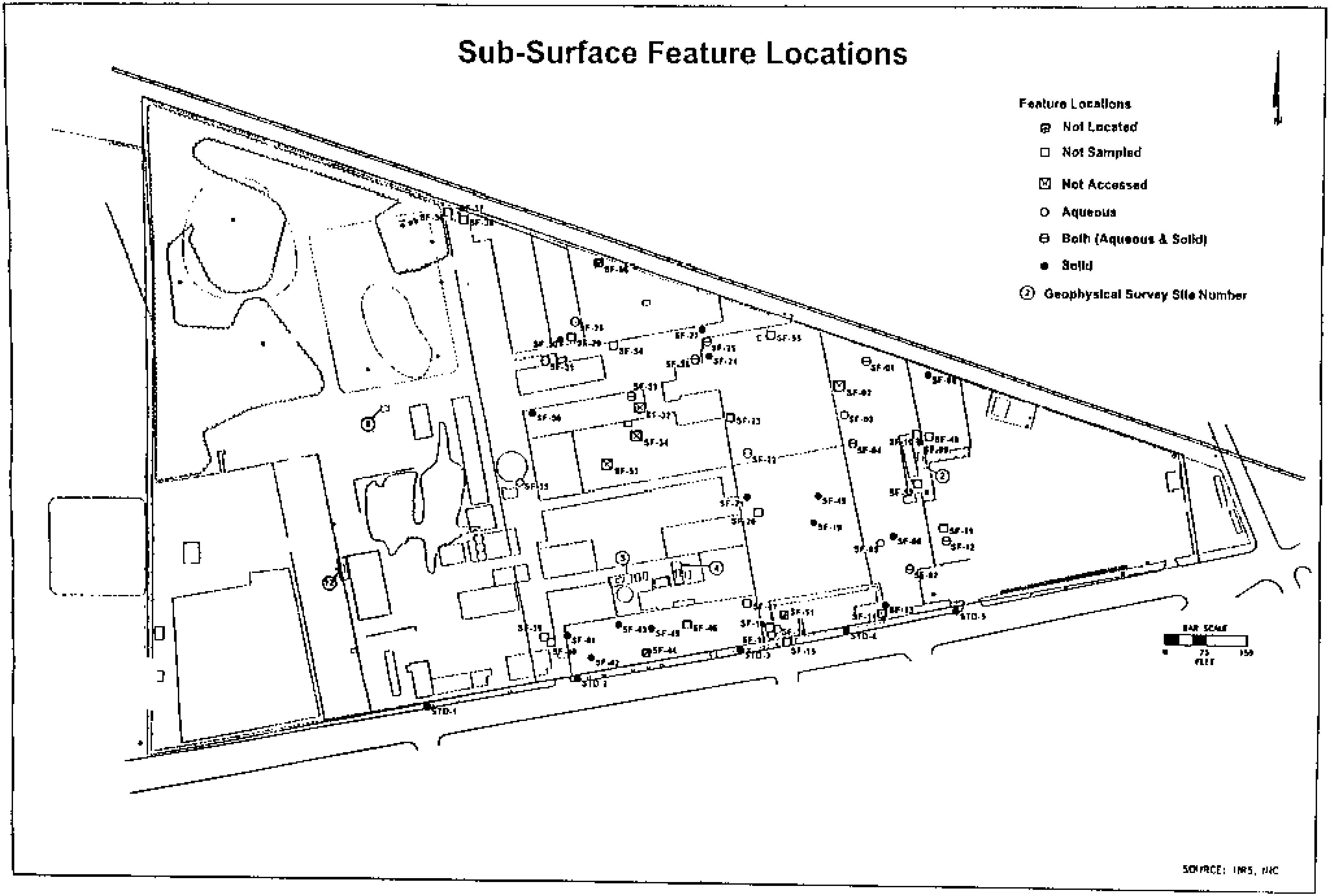


FIGURE 6 - SUBSURFACE FEATURE ATTEMPTED SAMPLING LOCATIONS

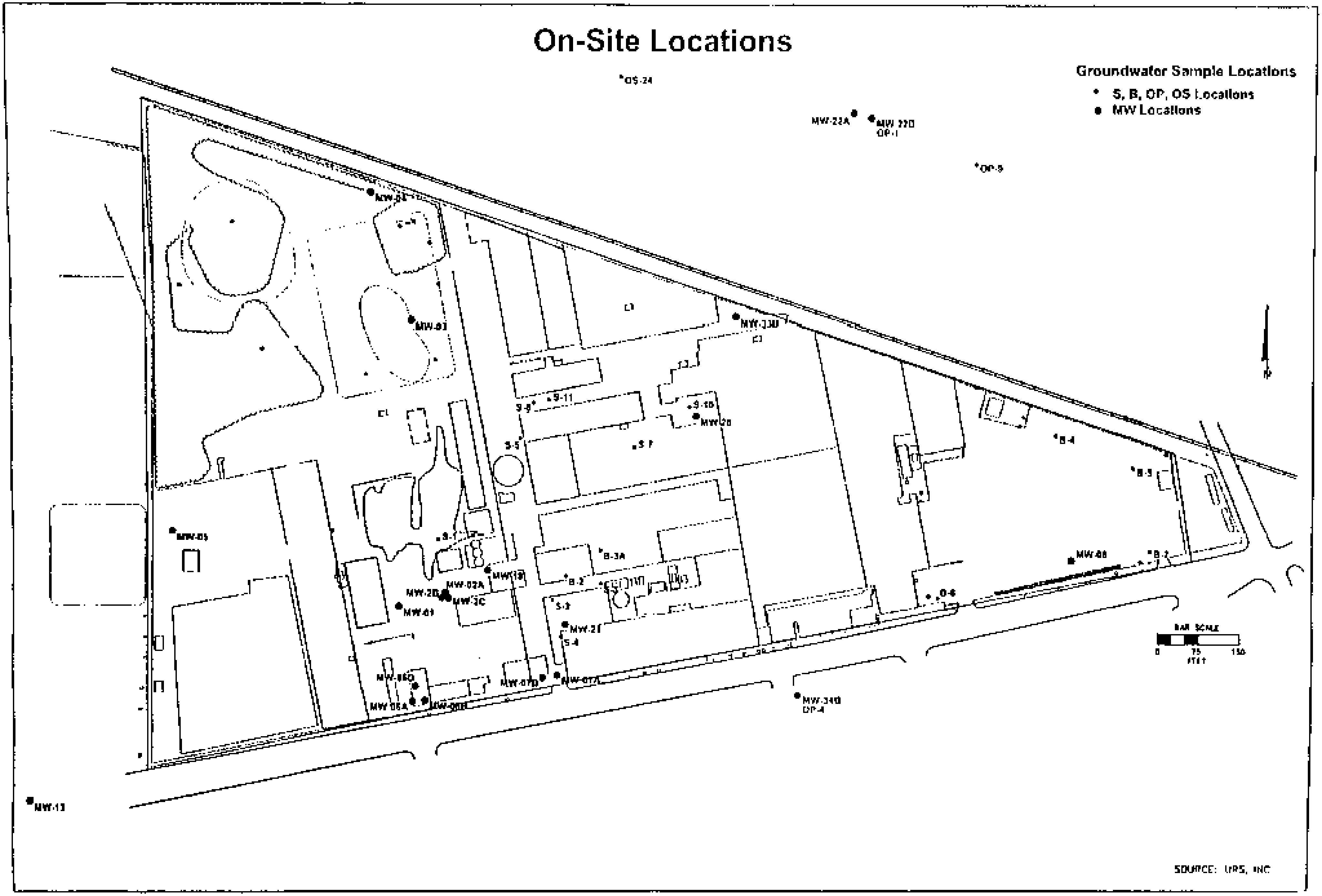


FIGURE 7 - ON-SITE SOIL SCREENING SAMPLING LOCATIONS

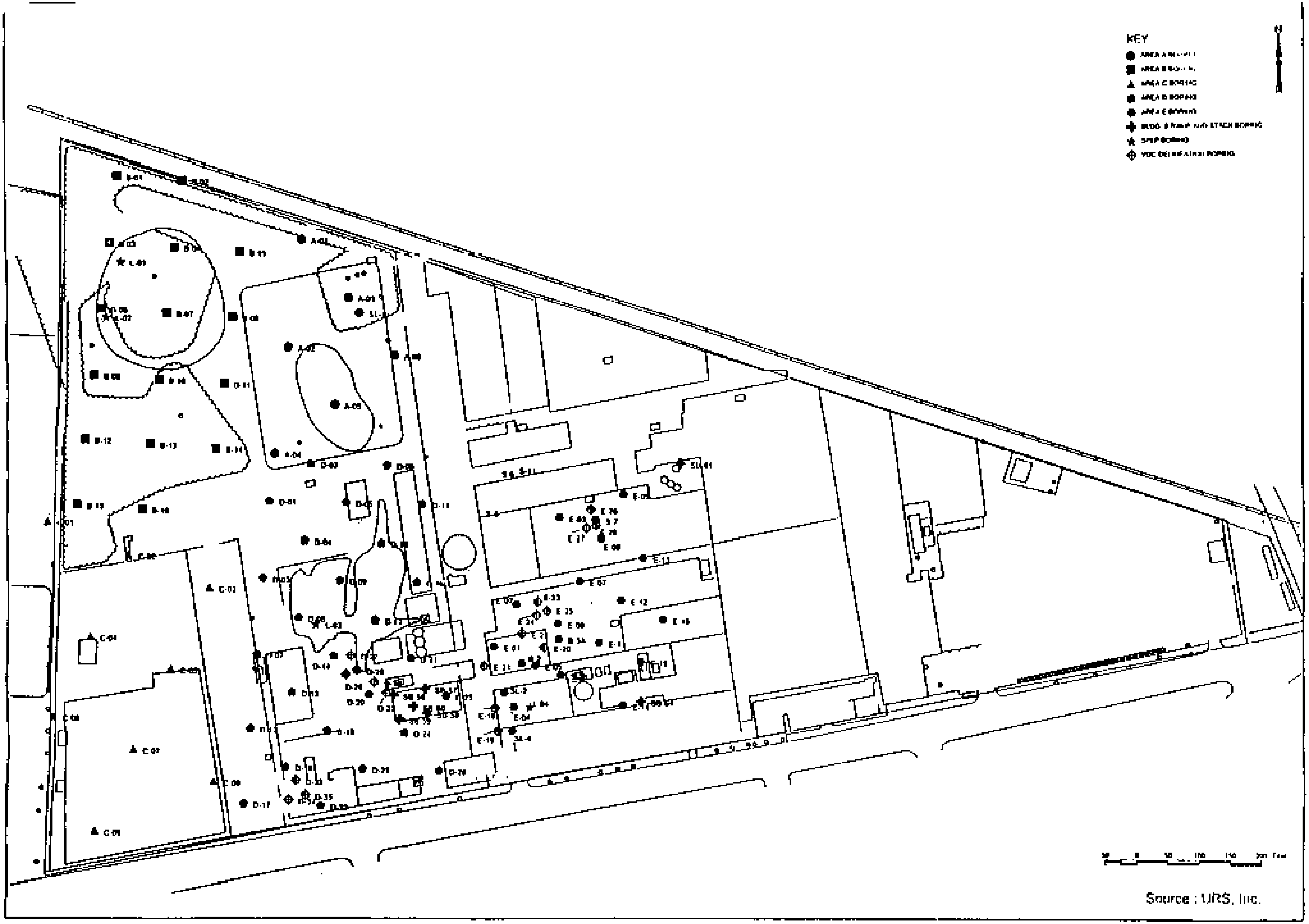


FIGURE 8 - SUPPLEMENTAL SOIL INVESTIGATION LOCATIONS

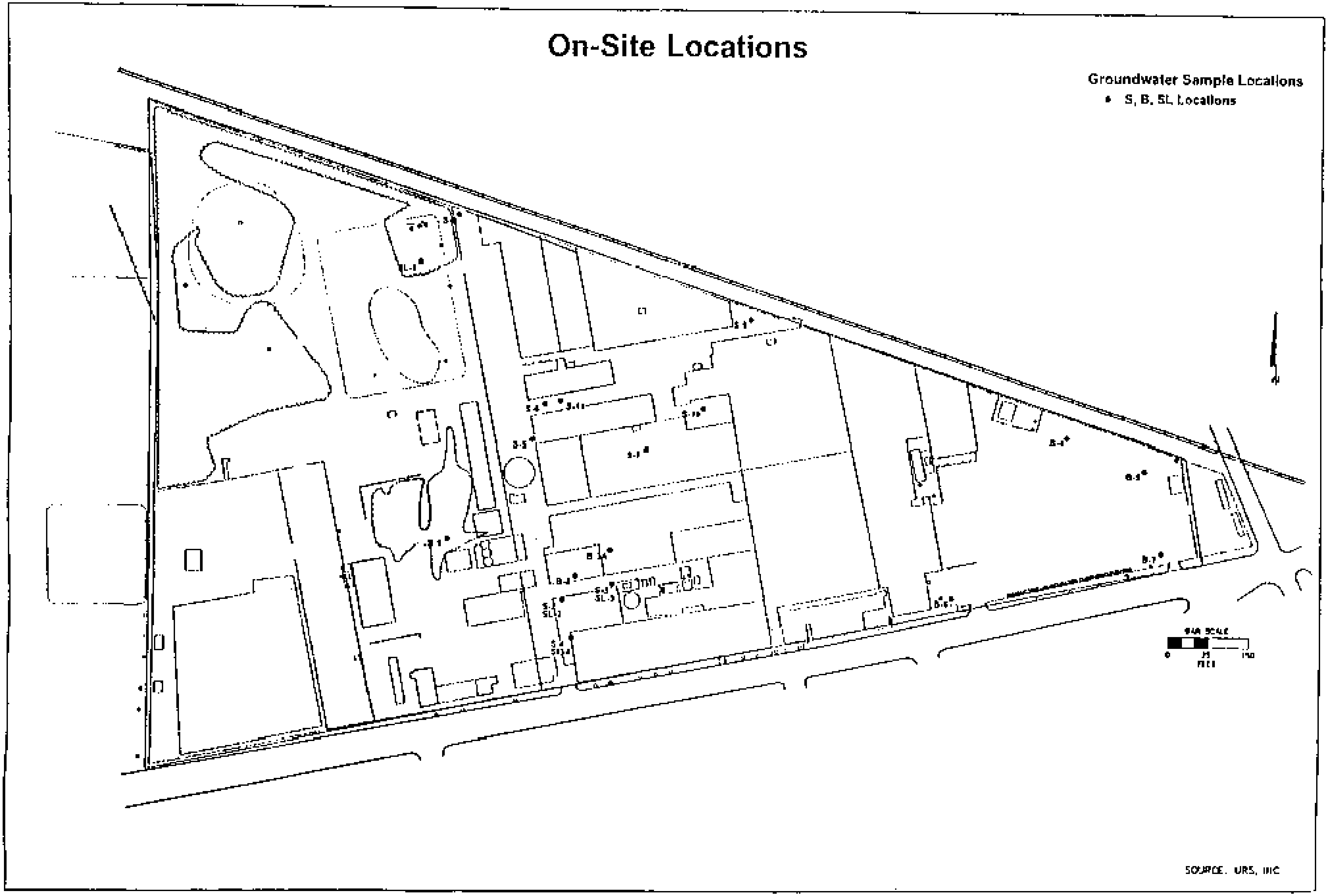


FIGURE 9 - ON-SITE GROUND WATER SCREENING SAMPLING LOCATIONS

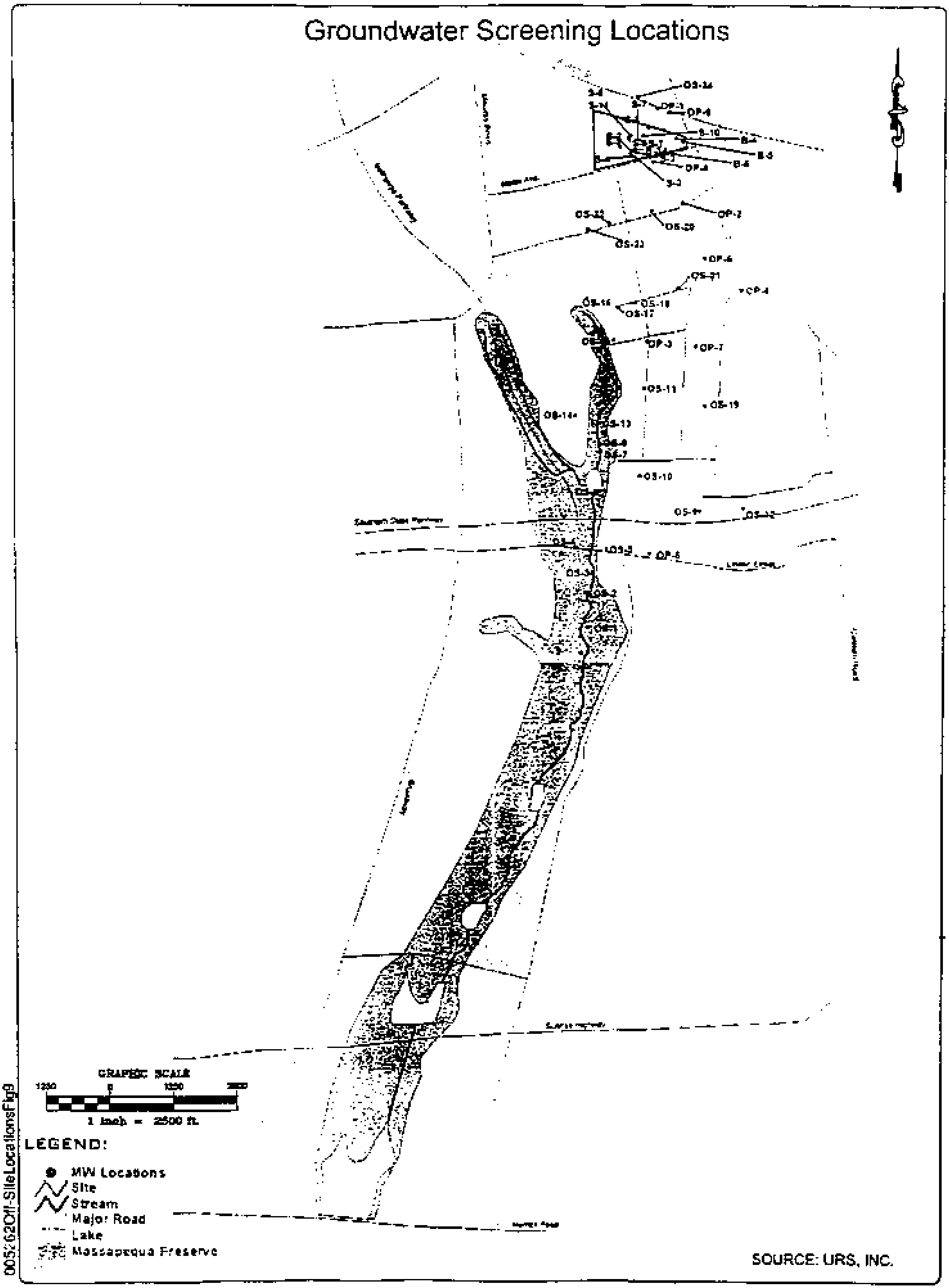


FIGURE 10 - ON-SITE AND OFF-SITE GROUNDWATER SCREENING SAMPLING LOCATIONS

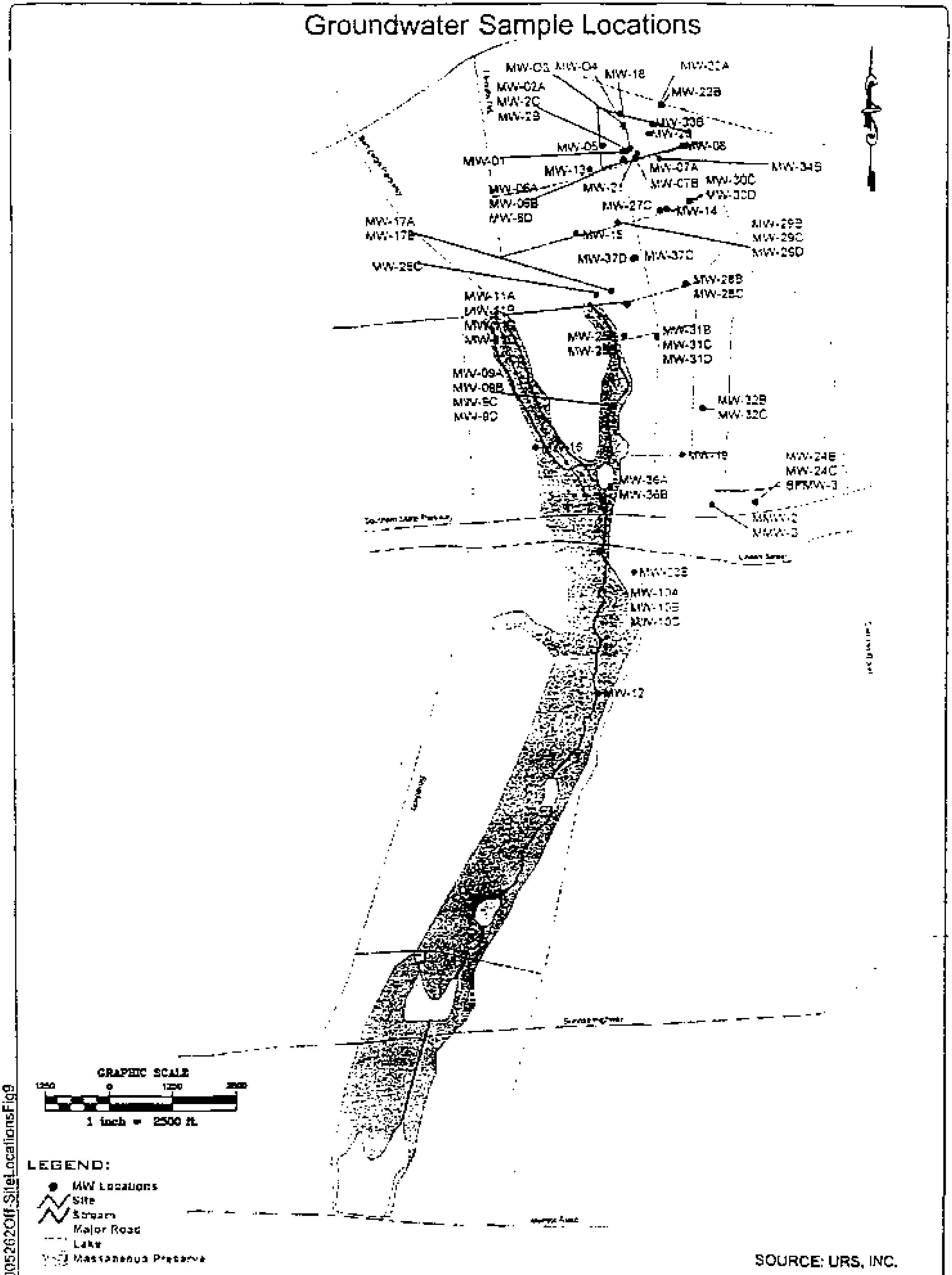
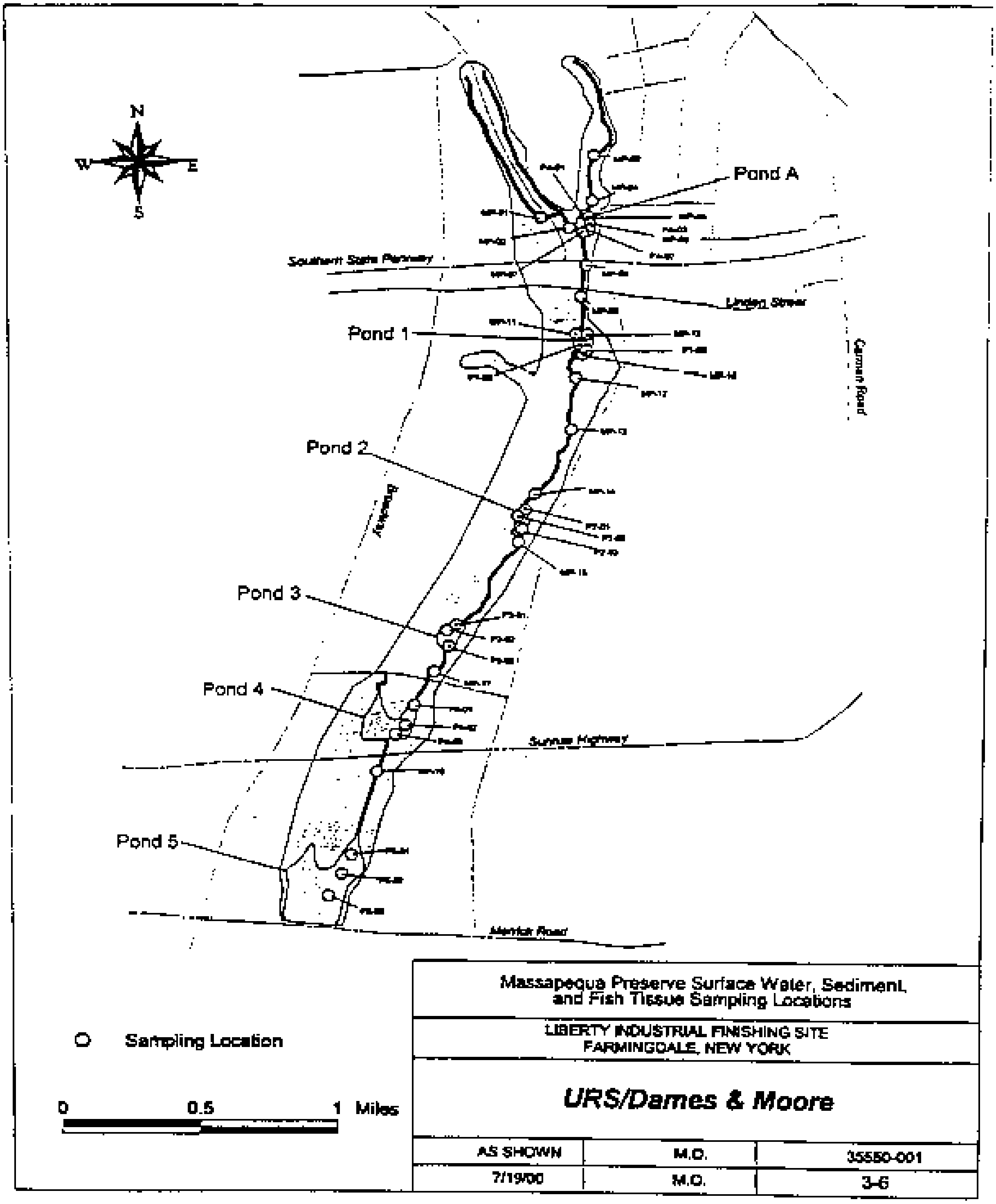


FIGURE 11 - ON-SITE AND OFF-SITE GROUNDWATER SAMPLING LOCATIONS



WESTON

Figure 4-1
Sample Location Map

FIGURE 12 - ECOLOGICAL SAMPLING LOCATIONS

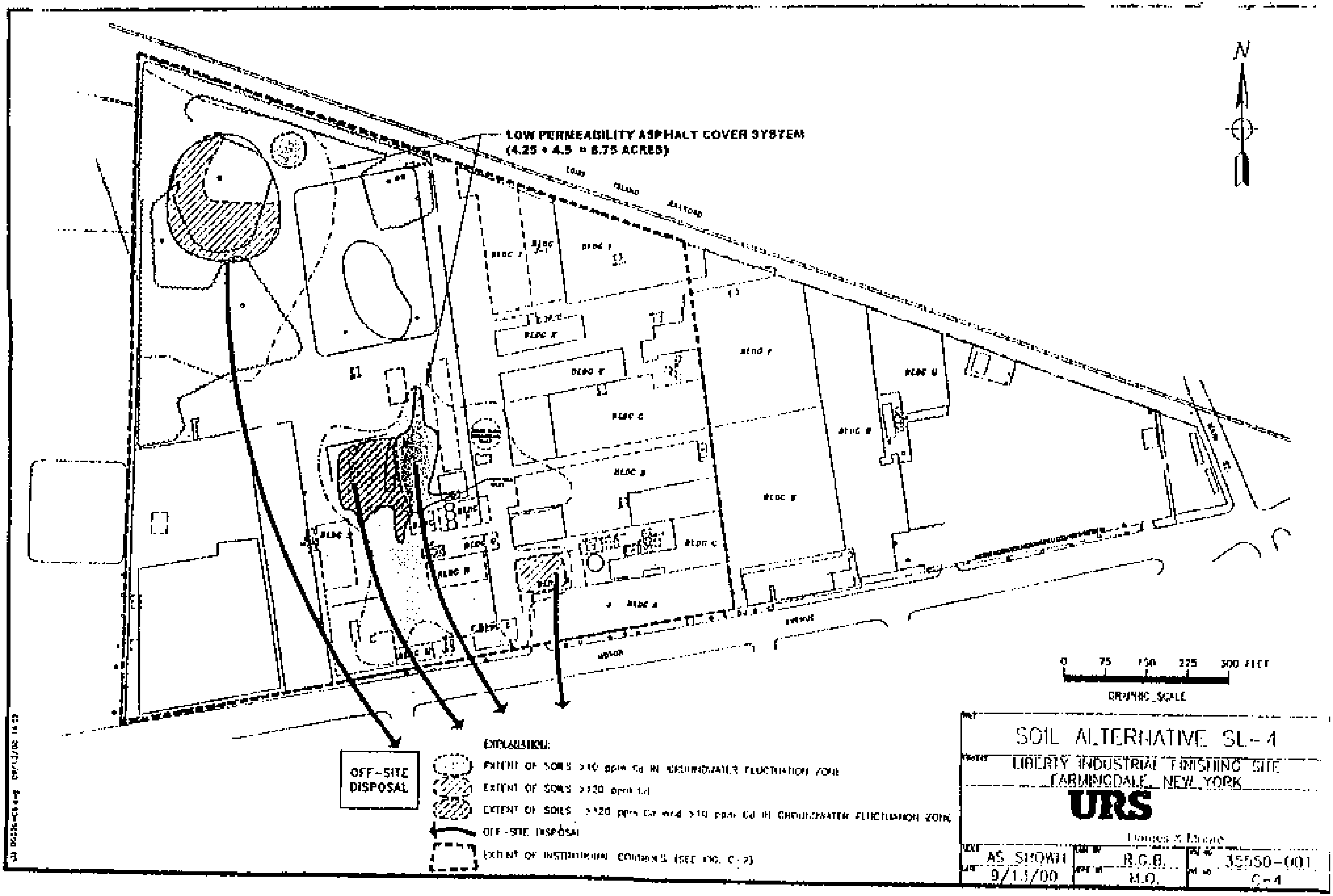


FIGURE 13 - ALTERNATIVE SL-2:
EXCAVATION AND OFF-SITE DISPOSAL OF CONTAMINATED SOILS NEAR THE WATER TABLE AND CAPPING OF OTHER CONTAMINATED SOILS

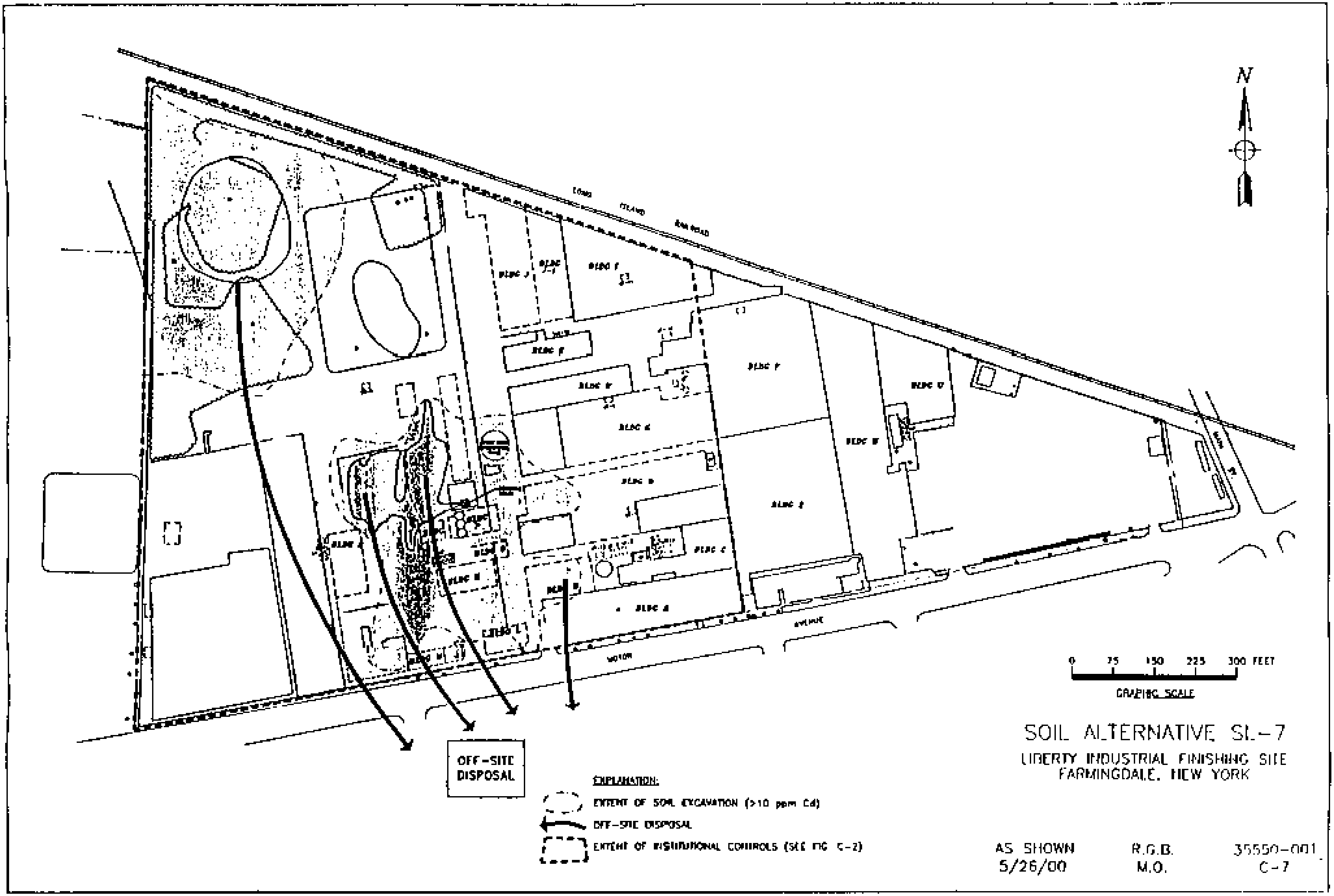


FIGURE 14 - ALTERNATIVE SL-3 EXCAVATION AND OFF-SITE DISPOSAL OF ALL CONTAMINATED SOILS

APPENDIX III

TABLES

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
SF-01	Building H	steel grate	2.5 ft diam	8.5	1.5 to 2.5	3 to 4	2 ft = cylindrical and becomes cone	yes (N and S)
SF-02	Building H	square steel cover	2.5 ft diam					
SF-03	Building H	square steel cover	2.5 ft diam	9.5	1.5	4	cylindrical and steps out	Yes (E and W)
SF-04	Building H	round steel cover	3 ft diam	5	0.5 to 1/5 sloping to west	0.5 to 1.5	cylindrical	yes (NE)
SF-05	Building H	round steel cover	2.5 ft diam	5	0.5	2	cylindrical	yes (E)
SF-06	Building H	square concrete part, round steel cover	Pad = 3ft x 3ft, Manway = 2 ft diam	2.5	at least 1.5	0	rectangular	yes (W and SE)
SF-07	Building H	round steel grate	2.5 ft diam	4	0.5	1	cylindrical	yes (NW and SE)
SF-08	Northern wall of Building U	Trapezoidal solid steel cover	2 ft x 2.5 ft x 1.5 ft x 1.5 ft	2	0.5	0	rectangular	Yes (roof drain pipe into opening)
SF-09	East of Building H, north of UT area, west of Building U	concrete pad with steel grate	pad = 3 ft x 3 ft, grate = 2 ft diam	3	0.5 to 1.5	<0.2	cylindrical	Yes (W, NE, SE)
SF-10	East of Building H, north of UT area, west of Building U	solid steel cover	3 ft x 3 ft	2.75	0.5	0	square	not visible
SF-11	East of Building H loading dock	NS						
SF-12	East of Building H loading dock	round steel cover	2 ft diam	9.5	unknown	4.25	cylindrical until 4.25 ft below surface May flare out quite extensively after 4.25 ft	no
SF-13	West of southwestern corner of Building H	rectangular steel cover and metal grate	2 ft x 3 ft	3.5 to 4 (sloping to south)	at least 2 ft	0	rectangular	yes (N from building)

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
SF-14	West of southwestern corner of Building H	U						
SF-15	North side of Motor Avenue where it intersects with Vandewater Road	U						
SF-16	East of Building A and south of Building E	Large concrete pad with solid steel cover	concrete pad = 14ft x 17ft, 2ft diam manway	8	0	5.25	rectangular	vertical
SF-17	East of Building A and south of Building E	Large concrete pad with solid steel cover	concrete pad = 14ft x 17ft, 2ft diam manway	8	0	5.25	rectangular	vertical
SF-18	East of Building A and south of Building E	steel pipe inside shed	2-inch diam, 9 inches above ground surface	2.25	<1/10th-inch	0	cylindrical	unknown
SF-19	Center on Building E	open box	0.75 ft x 0.75 ft	0.5 ft	<0.25 ft	0	square	none; old electric connections
SF-20	Western portion of Building E	asphalt/concrete mix outlining feature	10 ft x 11 ft	6.5	fill to 6.5	0	rectangualr ?	unknown
SF-21	Western wall of Building E	steel cover	2 ft x 2.5 ft	4.25	2.75	0	rectangular	2 fill ports, one pipe passing through
SF-22	Loading ramp in Building F	Steel Grate	1-ft x 1-ft	3	0.5	1.25	Square/cone	Not visible
SF-23	Men’s Restroom in Building F	NS						
SF-24	Northwest corner of Building F	large steel cover	4.5 ft x 10.5 ft	unknown	0.5 (could be more)	0	rectangular	unknown/no
SF-25	Northwest corner of Building F	large steel cover	3 ft x 3 ft	4.5	<0.25	< 0.5	square	Y (vertical and N/S)
SF-26	Northern portion of site in alley between Buildings F and I	open pit	4 ft x 4 ft	2 ft	thin layer (<4inches)	<0.5	square/rectangular	yes (from south into round concrete cover inside pit)
SF-27	Northern portion of site in alley between Buildings F and I	square steel cover	4 ft by 4 ft	2.5 ft	1.5 ft with leaves and debris	0	square	1" steel pipe connects E and W end

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NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
SF-28	Loading Dock #4 on western side of Building I	round steel grate	2 ft diam	6.75	2.5	1.25	bell shaped	Yes (w)
SF-29	Southern end of former Building J-I; north of existing Building K	NE						
SF-30	Southern end of former Building J-I; north of existing Building K	Steel Grate	3-ft diam with 4-ft diam at 3.5 ft to 4.5 ft	4.5	unknown	none	cylindrical	yes (E and SW)
SF-31	Loading ramp servicing northwestern portion of Building K	Steel Grate	2-ft diam.	7.5	2	2.5	Cone-shaped	Not Visible
SF-32	East end of Building W inside old office space	NA						
SF-33	East end of Building W on the west side of asphalt berm	steel cover over grated cover	2.5 ft x 2 ft	4	2	0.5	Rectangular	yes (8-inch pipe, E and W)
SF-34	South of Building W in north central portion of former Building G	NA						
SF-35	East of temporary D&M trailer location in gravel roadway (Southwest of Building W garage door)	solid steel cover	3 ft x 3 ft	11	unknown	0.25 at south end of tank	Apparently cylindrical	yes (S)
SF-36	Northern border of site, east of north/south fence and UT-9	caved in opening with old steel doors on hinges	3 ft x 3 ft	3 ft with something hollow beneath it	any fill that was tossed into opening	0	square	unknown
SF-37	Northern border of site, east of north/south fence and UT-9	caved in opening with old steel doors on hinges	3 ft x 3 ft	3 ft with something hollow beneath	any fill that was tossed into opening	0	square	unknown

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
SF-38	Northern border of site, east of north/south fence and UT-9	caved in opening with old steel doors on hinges	3 ft x 3 ft	3 ft with something hollow beneath	any fill that was tossed into opening	0	square	unknown
SF-39	West of Building A on western side of driveway/entrance	square steel lid	on 9 ft x 9 ft pad	8	0.1	0	square	piping connects to well head from East
SF-40	West of Building A on western side of driveway/entrance	square steel lid	on 9 ft x 9 ft pad	8	0.1	0	square	piping connects to well head from East
SF-41	Former basement area adjacent to Building A, north of Building A garage door	gravel area with outline of old building foundation	16 ft x 17 ft with adjacent 8 ft x 5 ft area	12	fill to 12	0	old basement	unknown
SF-42	West end of Building A, south of plant office (located in NW corner of building)	round depression in floor with square steel cover	1.5 ft diam	2.5	2.5	0	unknown	unknown
SF-43	West end of Building A, north of main thoroughfare through building	round depression in floor	2 ft diam	4	4	0	unknown	unknown
SF-44	Building A (south side of building)	NE						
SF-45	Center of Building A on north side of main thoroughfare (between letters L and R painted on north wall)	round depression in floor	2 ft diam	4.5	4.5	0	unknown	unknown
SF-46	Central/eastern end of Building A in main thoroughfare between letters N and Q painted on north wall	steel cover with round hole cut through it	3 ft x 2.5 ft	3 +	wood debris, plastic to 4	0	rectangular	no
SF-47	Building A (east side of building)	NE						

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
SF-48	West of main garage door of Building U, north of small office area	N/S row with 4 inch caps in floor	4 inch caps	1	0	0	horizontal piping beneath floor with vertical pipes to access openings in floor surface	horizontal piping beneath floor with vertical pipes to access openings in floor surface
SF-49	Center/east of Building E	asphalt/concrete mix outlining feature	9.5 ft x 4.5 ft	8.5	fill to 8.5	0	rectangular?	unknown
SF-50	West end of Building W near large garage door	rectangular steel lid	1 ft x 3 ft	2	1.25	0	rectangular?	yes (8-inch pipe on east and west)
SF-51	West end of unnamed building between Buildings A and H, North of Motor Ave. where it intersects with Vandewater	NL						
SF-52	East of Building H, south of SF-09	NE						
SF-53	Western end of former Building G, 100 feet southwest of UT-2	NS						
SF-54	South of Building I near alley between Buildings I and K	rectangular steel lid	4 ft x 3 ft	2.5	0.2	0	rectangular	1-inch steel pipe connects from east to west
SF-55	North side of Building F	square steel lid	6 ft x 6 ft	8.5	none	0	square	pipe connects well pump to pressure tank or UST
SF-56	North side of Building I	NE						

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NC - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Surface Feature	Surface Dimensions	Estimated Total Depth (ft)	Sediment Thickness (ft)	Water Thickness (ft)	Shape	Adjoining Pipes (direction)
STD-01	North side of Motor Avenue	round steel lid	3-ft diameter	8.0	>2.0	0.2	sqaure with constructed concrete walls	none visible
STD-02	North side of Motor Avenue	round steel lid	3-ft diameter	8.0	>2.0	0.5	sqaure with constructed concrete walls	none visible
STD-03	North side of Motor Avenue	round steel lid	3-ft diameter	8.0	>1.0	2.0	sqaure with constructed concrete walls	none visible
STD-04	North side of Motor Avenue	round steel lid	3-ft diameter	7.0	>2.0	0.4	sqaure with constructed concrete walls	none visible
STD-05	North side of Motor Avenue	round steel lid	3-ft diameter	8.0	>2.0	0	sqaure with constructed concrete walls	none visible

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NC - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
SF-01	Building H	concrete and cinder block	probable
SF-02	Building H		
SF-03	Building H	cinder block	probable
SF-04	Building H	concrete	yes
SF-05	Building H	brick with mortar	probable
SF-06	Building H	brick	unknown
SF-07	Building H	brick and cinder block, concrete after 3 feet	yes
SF-08	Northern wall of Building U	concrete	yes (has hole in it, pipe beneath it (also has hole) which held 0.5 ft sediment)
SF-09	East of Building H, north of UT area, west of Building U	concrete cinder block with mortar and brick	yes
SF-10	East of Building H, north of UT area, west of Building U	concrete	possible
SF-11	East of Building H loading dock		
SF-12	East of Building H loading dock	concrete	unknown
SF-13	West of southwestern corner of Building H	hollow cinder block	no

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NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
SF-14	West of southwestern corner of Building H		
SF-15	North side of Motor Avenue where it intersects with Vandewater Road		
SF-16	East of Building A and south of Building E	concrete	yes
SF-17	East of Building A and south of Building E	concrete	yes
SF-18	East of Building A and south of Building E	steel	sound hollow at 2.25
SF-19	Center of Building E	hard plastic	yes
SF-20	Western portion of Building E	concrete	yes
SF-21	Western wall of Building E	concrete in 2 feet	natural sand
SF-22	Loading ramp in Building F	concrete	not likely (orange/brown sand encountered
SF-23	Men's Restroom in Building F		
SF-24	Northwest corner of Building F	unknown	unknown
SF-25	Northwest corner of Building F	cinder blocks	yes
SF-26	Northern portion of site in alley between Buildings F and I	yes (top of a tank?)	
SF-27	Northern portion of site in alley between Buildings F and I	steel and brick/cinder blocks	

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NC - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
SF-28	Loading Dock #4 on western side of Building I	concrete	unknown
SF-29	Southern end of former Building J-I; north of existing Building K		
SF-30	Southern end of former Building J-I; north of existing Building K	concrete and brick	unknown
SF-31	Loading ramp servicing northwestern portion of Building K	concrete	unknown
SF-32	East end of Building W inside old office space		
SF-33	East end of Building W on the west side of asphalt berm	steel and cinder blocks	no
SF-34	South of Building W in north central portion of former Building G		
SF-35	East of temporary D&M trailer location in gravel roadway (Southwest of Building W garage door)	concrete	probable but not confirmed
SF-36	Northern border of site, east of north/south fence and UT-9	concrete	hollow object beneath 3 ft from ground surface
SF-37	Northern border of site, east of north/south fence and UT-9	concrete	hollow object beneath 3 ft from ground surface

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NC - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
SF-38	Northern border of site, east of north/south fence and UT-9	concrete	hollow object beneath 3 ft from ground surface
SF-39	West of Building A on western side of driveway/entrance	concrete	yes
SF-40	West of Building A on western side of driveway/entrance	concrete	yes
SF-41	Former basement area adjacent to Building A, north of Building A garage door	unknown	natural sand and gravel beneath fill
SF-42	West end of Building A, south of plant office (located in NW corner of building)	unknown	no, natural sand at 2.5
SF-43	West end of Building A, north of main thoroughfare through building	unknown	no, natural sand at 4
SF-44	Building A (south side of building)		
SF-45	Center of Building A on north side of main thoroughfare (between letters L and R painted on north wall)	unknown	no, natural sand at 4.5
SF-46	Central/eastern end of Building A in main thoroughfare between letters N and Q painted on north wall	concrete	encountered solidified resin, refusal
SF-47	Building A (east side of building)		

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NC - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
SF-48	West of main garage door of Building U, north of small office area	possible copper piping	Base is likely beneath horizontal piping
SF-49	Center/east of Building E	concrete?	natural sand, possible basement
SF-50	West end of Building W near large garage door	steel and cinder blocks	unknown
SF-51	West end of unnamed building between Buildings A and H, North of Motor Ave. where it intersects with Vandewater		
SF-52	East of Building H, south of SF-09		
SF-53	Western end of former Building G, 100 feet southwest of UT-2		
SF-54	South of Building I near alley between Buildings I and K	steel and cinder blocks	yes
SF-55	North side of Building F	concrete?	yes
SF-56	North side of Building I		

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 1
Subsurface Feature Characteristics
Liberty Industrial Finishing Site, Farmingdale, New York

ID No.	Location	Construction Material	Base Present?
STD-01	North side of Motor Avenue	concrete and cinder	probable but not confirmed
STD-02	North side of Motor Avenue	concrete and cinder	probable but not confirmed
STD-03	North side of Motor Avenue	concrete and cinder	probable but not confirmed
STD-04	North side of Motor Avenue	concrete and cinder	probable but not confirmed
STD-05	North side of Motor Avenue	concrete and cinder	probable but not confirmed

NA - not accessible
U - utility
NL - not located
NS - not sampled because others are in the vicinity or material is not suitable
NE - non-existent or no material exists to be sampled

TABLE 2

Page 1

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

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial Aquifer)
Exposure Medium: Groundwater (Upper Glacial Aquifer)

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Western Parcel	Cadmium	4.3	384	ug/l	28/29	384	ug/l	Max
	Chromium VI	37.2	426	ug/l	12/16	426	ug/l	Max

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Eastern Parcel	Benzo[a]pyrene	0.1	41	ug/l	8/15	41	ug/l	Max
	Dibenz[ah]anthracene	0.1	7	ug/l	6/15	7	ug/l	Max
	Chromium VI	1.4	11400	ug/l	11/15	11400	ug/l	Max
	Aroclor 1260	1.5	33	ug/l	3/14	9.49	ug/l	95% UCL-T

TABLE 2

Page 2

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

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial Aquifer)
Exposure Medium: Groundwater (Upper Glacial Aquifer)

Exposure Point	Chemical of Concern	Concentration Detected		Concen-tration Units	Frequency of Detection	Exposure Point Concen-tration	Exposure Point Concen-tration Units	Statistical Measure
		Min	Max					
Offsite Resi-dential Area	Vinyl Chloride	1	72	ug/l	4/38	72.3	ug/l	95% UCL-T
	Cadmium	1.6	126	ug/l	23/38	126	ug/l	Max
	Chromium VI	39.4	472	ug/l	8/16	472	ug/l	Max
	Manganese	7.4	8530	ug/l	32/32	8530	ug/l	Max

Scenario Timeframe: Future
Medium: Groundwater (Magothy Aquifer)
Exposure Medium: Groundwater (Magothy Aquifer)

Exposure Point	Chemical of Concern	Concentration Detected		Concen-tration Units	Frequency of Detection	Exposure Point Concen-tration	Exposure Point Concen-tration Units	Statistical Measure
		Min	Max					
Offsite Residential Area	Trichloroethene	1	740	ug/l	12/22	740	ug/l	Max
	Chromium VI	51.6	54.3	ug/l	2/21	32.5	ug/l	95% UCL-T
	Manganese	81.5	1200	ug/l	22/2	539	ug/l	95% UCL-T

Key

mg/kg: milligram per kilogram; parts per million
ppm: parts per million
95% UCL: 95% Upper Confidence Limit
MAX: Maximum Concentration

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

The table presents the chemicals of concern (COCs) and exposure point concentration for each of the COCs detected in media at the Liberty site (*i.e.*, the concentration that will be used to estimate the exposure and risk from each COC in each media). COCs are found only in the Upper Glacial Aquifer in the Western Parcel, the Liquid Waste in the subsurface features in the Eastern Parcel, and in the Upper Glacial and Magothy Aquifers in the Offsite Residential areas. The table includes the range of concentrations detected for each COC, 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. The table indicates that cadmium, chromium VI, manganese, Aroclor 1260, vinyl chloride, trichlorethene, and the PAHs benzo[a]pyrene and dibenz[ah]anthracene are the COCs at the site.

TABLE 3

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/Exclusion of Exposure Pathway
Future	Ground-water (Upper Glacial)	Groundwater	Western Parcel	Commercial/ Industrial Worker	Adult	Ingestion	Onsite	Aquifer is designated as the sole source potable water supply by the State.
Future	Liquid Waste	Liquid Waste	Eastern Parcel	Commercial/ Industrial Worker	Adult	Dermal Contact	Onsite	Construction workers could come in contact with materials during construction.
Future	Ground-water (Upper Glacial)	Groundwater	Offsite Residential Area (Tap)	Resident	Adult	Ingestion Inhalation Dermal Contact	Offsite	Aquifer is designated as the sole source potable water supply by the State.
				Resident	Child	Ingestion Inhalation Dermal Contact	Offsite	Aquifer is designated as the sole source potable water supply by the State.
Future	Ground-water (Magothy)	Groundwater	Offsite Residential Area (Tap)	Resident	Adult	Ingestion Inhalation Dermal Contact	Offsite	Aquifer is designated as the sole source potable water supply by the State.
				Resident	Child	Ingestion Inhalation Dermal Contact	Offsite	Aquifer is designated as the sole source potable water supply by the State.

Summary of Selection of Exposure Pathways

The table presents the exposure pathways included in the risk assessment which are associated with unacceptable levels of risk, and the rationale for the inclusion of each pathway. Exposure media, exposurepoints, and characteristics of receptor populations are included. A complete list of exposure pathways is included in the Baseline Human Health Risk Assessment.

TABLE 4

Page 1

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
Cadmium	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	03/14/99
Chromium VI	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	03/14/99
Aroclor 1260	2E+00	$(mg/kg\text{-}day)^{-1}$	2E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	05/23/00
Vinyl Chloride	1.9	$(mg/kg\text{-}day)^{-1}$	1.9	$(mg/kg\text{-}day)^{-1}$	A	HEAST	1997
Manganese	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	03/14/99
Trichloroethene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	1.1E-02	$(mg/kg\text{-}day)^{-1}$	B2-C	NCEA	NA
Benzo[a]pyrene	7.3E00	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	03/14/99
Dibenz[ah]anthracene	7.3E00	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	03/14/99

-Inhalation

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
Cadmium	1.8E-03	$(ug/cu.m)^{-1}$	6.3E+00	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	03/14/99
Chromium VI	1.2E-02	$(ug/cu.m)^{-1}$	4.2E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	03/14/99
Aroclor 1260	5.7E-04	$(ug/cu.m)^{-1}$	2E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	09/01/96
Vinyl Chloride	NA	$(ug/cu.m)^{-1}$	03E-01	$(mg/kg\text{-}day)^{-1}$	A	HEAST	1997
Manganese	NA	$(ug/cu.m)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	03/14/99
Trichloroethene	1.7E-06	$(ug/cu.m)^{-1}$	6.0E-03	$(mg/kg\text{-}day)^{-1}$	B2-C	NCEA	NA
Benzo[a]pyrene	8.9E-04	$(ug/cu.m)^{-1}$	3.1E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	03/14/99
Dibenz[ah]anthracene	NA	$(ug/cu.m)^{-1}$	3.1E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	03/14/99

TABLE 4

Page 2

Cancer Toxicity Data Summary

Key

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

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 the contaminants of concern in groundwater, soil, liquid waste, solid waste, and air. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

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	Unce-rtainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Cadmium	Chronic	5E-04	mg/kg-day	1.25E-05	mg/kg-day	Kidney	10	IRIS	03/14/99
Chromium VI	Chronic	3E-03	mg/kg-day	7.5E-05	mg/kg-day	NOEL	500	IRIS	03/14/99
Aroclor 1260	Chronic	5E-05	mg/kg-day	5E-05	mg/kg-day	Immune	300	IRIS	03/14/99
Vinyl Chloride	Chronic	5E-03	mg/kg-day	NA	NA	Liver	NA	IRIS	05/01/99
Manganese	Chronic	2.3E-02	mg/kg-day	9.2E-04	mg/kg-day	CNS	3	IRIS	03/20/99
Trichloroethene	Chronic	5.7E-02	mg/kg-day	5.7E-02	mg/kg-day	NA	NA	IRIS	10/01/98
Benzo[a]pyrene	Chronic	NA	mg/kg-day	NA	NA	NA	NA	NA	NA
Dibenz[ah]-anthracene	Chronic	NA	mg/kg-day	NA	NA	NA	NA	NA	NA

-Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Unce-rtainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Cadmium	Chronic	2E-04	mg/cu. m	1E-04	mg/kg-day	Kidney	NA	NCEA	12/18/97
Chromium VI	Chronic	1E-04	mg/cu. m	3E-05	mg/kg-day	Respiratory	300	IRIS	03/14/99
Aroclor 1260	Chronic	NA	mg/cu. m	NA	mg/kg-day	NA	NA	NA	NA
Vinyl Chloride	Chronic	NA	mg/cu. m	NA	mg/kg-day	NA	NA	NA	NA
Manganese	Chronic	5E-05	mg/cu. m	1.4E-5	mg/kg-day	CNS	1000	IRIS	03/14/99
Trichloroethene	Chronic	NA	mg/cu. m	NA	mg/kg-day	NA	NA	NA	NA
Benzo[a]pyrene	Chronic	NA	mg/cu. m	NA	NA	NA	NA	NA	NA
Dibenz[ah]-anthracene	Chronic	NA	mg/cu. m	NA	NA	NA	NA	NA	NA

Key

NA: No information available
NOAEL: No Observable Adverse Effect Level
IRIS: Integrated Risk Information System, U.S. EPA
HEAST: Health Effects Assessment Summary Tables, U.S. EPA
NCEA: National Center for Environmental Assessment, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater, soil, liquid waste, solid waste and air. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs).

TABLE 6

Page 1

Risk Characterization Summary - Carcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel	Benzo[a]pyrene Dibenz[ah]anthracene	– –	– –	5.3E-04 2.4E-04	5.3E-04 2.4E-04
						Total Risk =	7.7E-04

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern Primary Target Organ	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-Water (Upper Glacial)	Ground-Water	Offsite Residential Area	Vinyl Chloride	1.6E-03	–	7.7E-05	1.7E-03
						Total Risk =	1.7E-03

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern Primary Target Organ	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water (Upper Glacial)	Ground-Water	Offsite Residential Area	Vinyl Chloride	–	5.0E-04	–	5.0E-04
						Total Risk =	5.0E-04

TABLE 6

Page 2

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern Primary Target Organ	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water - Magothy	Ground-Water	Offsite Residential Area	Trichloroethene	1.7E-04	–	2.7E-05	1.9E-04
						Total Risk =	1.9E-04

TABLE 7

Page 1

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water (Upper Glacial)	Ground-water	Western Parcel	Cadmium Chromium VI	Kidney NOEL	7.5E+00 1.4E+00	-- --	-- --	7.5E+00 1.4E+00
							Total Risk =	8.9E+00

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel	Chromium VI Aroclor 1260	NOEL Immune	-- --	-- --	1.5E+00 3.0E+01	1.5E+00 3.0E+01
							Total Risk =	3.1E+01

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water (Upper Glacial)	Ground-water	Offsite Residen-ial Area	Cadmium Chromium VI Manganese Vinyl Chloride	Kidney NOEL CNS Liver	3.22E+01 5.22E+00 4.74E+01 1.08E+00	-- -- -- --	2.7E+00 3.4E+00 2.5E+00 3.00E-02	3.5E+01 8.7E+00 5.0E+01 1.1E+00
							Total Risk =	9.5E+01

TABLE 7

Page 2

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water (Upper Glacial)	Ground-water	Offsite Residential Area	Cadmium	Kidney	6.9E+00	--	1.5E+00	8.4E+00
			Chromium VI	NOEL	4.3E+00	--	1.8E+00	6.1E+00
			Manganese	CNS	1.0E+01	--	1.3E+00	1.1E+01
							Total Risk =	2.6E+01

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water - Magothy	Ground-water	Offsite Residential Area	Chromium VI	NOEL	1.4E+00	--	3.7E-01	1.7E+00
			Manganese	CNS	3.0E+00	--	2.5E-01	3.2E+00
			Trichloro-ethylene	NA	1.7E+00	--	1.8E-01	1.8E+00
							Total Risk =	6.7E+00

Table 8 - Estimated Groundwater Alternative GW-3 - Plume A
Liberty Industrial Finishing Site, Farmingdale, New York

Item	Description	Quantity	Unit	Cost		Subtotal
1	Access Negotiation	1	l.s.	$25,000	$25,000	$25,000
2	Legal Fees	1	ls	$50,000	$50,000	$50,000
3	Bench-and Field Scale Testing	1	l.s.	$150,000	$150,000	$150,000
4	SPDES Permitting	1	l.s.	$20,000	$20,000	$20,000
5	Site Preparation					$61,200
	Mobilization, Decon Pad, Erosion Control, Fencing	1	ls	$50,000	$50,000	
	Office and Construction Trailers	4	mo	$800	$3,200	
	Utilities	4	mo	$1,000	$4,000	
	Supplies	4	mo	$1,000	$4,000	
6	Well Installations (incl. oversight)					$322,000
	Extraction Wells (60 ft)	2	well	$15,000	$30,000	
	Extraction Wells (180 ft)	2	well	$30,000	$60,000	
	Shallow monitoring wells	12	well	$6,000	$72,000	
	Deep monitoring wells	12	well	$12,000	$144,000	
	Traffic-rated manhole	4	ea.	$4,000	$16,000	
7	Equipment					$1,500,000
	VOC treatment	1	ls	$300,000	$300,000	
	Metals treatment	1	ls	$1,200,000	$1,200,000	
8	Structural (treatment building)	4,000	sf	$65	$260,000	$260,000
9	Transport and Disposal (D Code)	1,500	ton	$40	$60,000	$60,000
	SUBTOTAL					$2,373,200
10	Mechanical Installation					$508,660
	Horizontal Drilling	5,200	lf	$75	$390,000	
	Internal Building Piping (5% of subtotal)				$118,660	
11	Electrical Installation (10 % of subtotal)				$237,320	$237,320
12	Civil Site Work (10% of subtotal)				$237,320	$237,320
13	Instrumentation (5% of subtotal)				$118,660	$118,660
	TOTAL DIRECT CONSTRUCTION COSTS					$3,475,160
14	Engineering and Oversight (15% of subtotal)				$521,274	$521,274
15	Contingency (20 percent)				$695,032	$695,032
	INSTALLED CAPITAL COSTS					$4,691,466

Present Value Analysis for Operation and Maintenance Costs

Year	Cost Type	Cost Per Year	Factor (7%)	Present Value	Notes
1-20	Annual O&M Cost	$913,000	10.593	$9,671,409	Quarterly inspection, semiannual groundwater monitoring, annual cap maintenance
	Continuation of NTCRA: $325,000/year				
	Utilities: $150,000/year				
	Maintenance: 52 days @ $750/day				
	Operations: 250 days @ $500/day				
	Engineering/Regulatory Support: $25,000/year				
	Replacement Materials: $100,000/year				
	Disposal: $80,000/year				
	Parts Replacement: $10,000/year				
	Piping Repair: $10,000/year				
	Semiannual Groundwater Sampling: $25,000/year				
	Discharge Monitoring Sampling: 12 months @ $2,000/month				
5	Periodic Cost	$10,000	0.713	$7,130	5-year review
10	Periodic Cost	$1,111,070	0.508	$564,812	5-year review, major overhaul of treatment system (assumed at 35% of capital cost items 6-8, 10, 11, 13, and 14)
15	Periodic Cost	$10,000	0.362	$3,625	5-year review
20	Periodic Cost	$1,403,770	0.258	$362,762	5-year review; decommissioning of wells and treatment system (assumed at 35% of capital cost items 5-8, 10, 11, 13, and 14); and monitored natural attenuation study for residual groundwater contamination remaining after treatment
21	Periodic Cost	$180,000	0.242	$43,474	2nd year of monitored natural attenuation study
	Groundwater Samping: 4 qtr @ $32,500/qtr				
	Modeling Support: 4 qtr @ $7,500/qtr				
	Reporting: 4 qtr @ $5,000/qtr				
	Total O&M Present Worth Costs (20 years at 7 percent)			$10,609,738	
	ESTIMATED TOTAL PRESENT WORTH COST				$15,301,204

Table 8 - Estimated Groundwater Alternative GW-3 - Plume B
Liberty Industrial Finishing Site, Farmingdale, New York

Item	Description	Quantity	Unit	Cost		Subtotal
1	Access Negotiation	1	l.s.	$10,000	$10,000	$10,000
2	Legal Fees	1	ls	$25,000	$25,000	$25,000
3	Bench-and Field Scale Testing	1	l.s.	$15,000	$15,000	$15,000
4	SPDES Permitting	1	l.s.	$20,000	$20,000	$20,000
5	Site Preparation					$26,200
	Mobilization, Decon Pad, Erosion Control, Fencing	1	ls	$15,000	$15,000	
	Office and Construction Trailers	4	mo	$800	$3,200	
	Utilities	4	mo	$1,000	$4,000	
	Supplies	4	mo	$1,000	$4,000	
6	Well Installations (incl. oversight)					$62,000
	Extraction Wells (60 ft)	2	well	$15,000	$30,000	
	Extraction Wells (180 ft)	0	well	$30,000	$0	
	Shallow monitoring wells	4	well	$6,000	$24,000	
	Deep monitoring wells	0	well	$12,000	$0	
	Traffic-rated manhole	2	ea.	$4,000	$8,000	
7	Equipment					$170,000
	VOC treatment	1	ls	$170,000	$170,000	
	Metals treatment	0	ls	$1,200,000	$0	
8	Structural (treatment building)	400	sf	$65	$26,000	$26,000
9	Transport and Disposal (D Code)	100	ton	$40	$4,000	$4,000
	SUBTOTAL					$323,200
10	Mechanical Installation					$20,000
	Piping Installation	500	lf	$40	$20,000	
11	Electrical Installation (5% of subtotal)				$16,160	$16,160
12	Civil Site Work (5% of subtotal)				$16,160	$16,160
13	Instrumentation (5% of subtotal)				$16,160	$16,160
	TOTAL DIRECT CONSTRUCTION COSTS					$391,680
14	Engineering and Oversight (10% of subtotal)				$39,168	$39,168
15	Contingency (20 percent)				$78,336	$78,336
	INSTALLED CAPITAL COSTS					$509,184

Present Value Analysis for Operation and Maintenance Costs

Year	Cost Type	Cost Per Year	Factor (7%)	Present Value	Notes
1-20	Annual O&M Cost	$159,000	10.593	$1,684,287	Quarterly inspection, semiannual groundwater monitoring, annual cap maintenance
	Utilities: $30,000/year				
	Maintenance: 52 days @ $750/day				
	Operations: 52 days @ $500/day				
	Engineering/Regulatory Support: $15,000/year				
	Replacement Materials: $8,000/year				
	Disposal: $5,000/year				
	Parts Replacement: $5,000/year				
	Piping Repair: $1,000/year				
	Semiannual Groundwater Sampling: $6,000/year				
	Discharge Monitoring Sampling: 12 months @ $2,000/month				
5	Periodic Cost	$10,000	0.713	$7,130	5-year review
10	Periodic Cost	$110,621	0.508	$56,234	5-year review, major overhaul of treatment system (assumed at 35% of capital cost items 6-8, 10, 11, 13, and 14)
15	Periodic Cost	$10,000	0.362	$3,625	5-year review
20	Periodic Cost	$242,321	0.258	$62,621	5-year review; decommissioning of wells and treatment system (assumed at 35% of capital cost items 5-8, 10, 11, 13, and 14); and monitored natural attenuation study for residual groundwater contamination remaining after treatment
21	Periodic Cost	$110,000	0.242	$26,567	2nd year of monitored natural attenuation study
	Groundwater Samping: 4 qtr @ $15,000/qtr				
	Modeling Support: 4 qtr @ $7,500/qtr				
	Reporting: 4 qtr @ $5,000/qtr				
	Total O&M Present Worth Costs (20 years at 7 percent)			$1,813,896	

ESTIMATED TOTAL PRESENT WORTH COST $2,323,080

Table 9 - Estimated Cost Sediment Alternative SD-2
Liberty Industrial Finishing Site, Farmingdale, New York

Item	Description	Quantity	Unit	Cost		Subtotal
1	Access Negotiation	1	ls	$20,000	$20,000	$20,000
2	Site Preparation					$291,800
	Mobilization	1	ls	$50,000	$50,000	
	Decontamination Facility	1	ls	$25,000	$25,000	
	Sediment and Erosion Control	4	ac	$25,000	$100,000	
	Delineation and Volume Estimation	1	ls	$100,000	$100,000	
	Office and Construction Trailers	6	mo	$800	$4,800	
	Utilities	6	mo	$1,000	$6,000	
	Supplies	6	mo	$1,000	$6,000	
3	Excavation/Extraction and Dewatering					$1,080,000
	Labor	120	day	$4,000	$480,000	
	Equipment	4	mo	$150,000	$600,000	
4	Backfill and Placement	7,700	cy	$75	$577,500	$577,500
5	Transport and Disposal					$154,000
	C Code (hazardous waste)		ton	$120	$0	
	D Code (non-hazardous waste)	3,850	ton	$40	$154,000	
6	Confirmatory Sampling	100	ea	$250	$25,000	$25,000
	SUBTOTAL					$2,148,300
7	Other Costs					$135,000
	Wetland Delineation and Survey	1	ls	$35,000	$35,000	
	Assessment of Wetland Resources	1	ls	$5,000	$5,000	
	Floodplain Delineation	1	ls	$20,000	$20,000	
	Wetlands Restoration	1	acre	$75,000	$75,000	
	TOTAL DIRECT CONSTRUCTION COSTS					$2,283,300
8	Engineering (5% of subtotal)				$114,165	$114,165
9	Oversight	180	day	$750	$135,000	$135,000
10	Contingency (20 percent)				$456,660	$456,660
	TOTAL INSTALLED CAPITAL COST					$2,989,125

Present Value Analysis for Operation and Maintenance Costs

Year	Cost Type	Cost Per Year	Factor (7%)	Present Value	Notes
1-20	Annual O&M Cost	$30,000	10.593	$317,790	Regulatory Support at $10,000; Wetland Maintenance at $10,000; and Ecological Assessments at $10,000
5	Periodic Cost	$30,000	0.713	$21,390	5-year review; Biomonitoring (macroinverterbrate sampling and analysis at $20,000)
10	Periodic Cost	$45,000	0.508	$22,876	5-year review; Biomonitoring (macroinverterbrate sampling and analysis at $20,000) and Toxicity testing at $15,000
15	Periodic Cost	$30,000	0.362	$10,874	5-year review; Biomonitoring (macroinverterbrate sampling and analysis at $20,000)
20	Periodic Cost	$45,000	0.258	$11,629	5-year review; Biomonitoring (macroinverterbrate sampling and analysis at $20,000) and Toxicity testing at $15,000
	Total O&M Present Worth Costs (20 years at 7 percent)			$384,558	

ESTIMATED TOTAL PW COST	$3,373,683

Table 10 - Estimated Cost Soil Alternative SL-3
Liberty Industrial Finishing Site, Farmingdale, New York

Item	Description	Quantity	Unit	Cost		Subtotal
1	Monitoring Well Installation					$24,000
	shallow wells (< 65 feet)	4	ea	$3,500	$14,000	
	deep wells (>65 feet)	2	ea	$5,000	$10,000	
2	Access Negotiation	1	ls	$10,000	$10,000	$10,000
3	Legal Fees	1	ls	$25,000	$25,000	$25,000
4	Mobilization/Demobilization	1	ls	$50,000	$50,000	$50,000
5	Site Preparation and Monitoring					$268,900
	Erosion Control	17	ac	$1,500	$25,500	
	Site Surveying	1	ls	$25,000	$25,000	
	Fencing (incl. 2 gates)	3,000	ft	$20.00	$60,000	
	Office and Construction Trailers	18	mo	$800	$14,400	
	Health and Safety Supplies	18	mo	$3,500	$63,000	
	Health and Safety Monitoring	18	mo	$2,500	$45,000	
	Utilities	18	mo	$1,000	$18,000	
	Supplies	18	mo	$1,000	$18,000	
6	Excavation	82,000	cy	$6	$451,000	$451,000
7	Backfill and Placement	87,700	cy	$25	$2,192,500	$2,192,500
8	Transport and Disposal (C code)	24,000	ton	$120	$2,880,000	$2,880,000
9	Transport and Disposal (D code)	99,000	ton	$40	$3,960,000	$3,960,000
10	Cover System					$0
	Section 360-type Cap		sf	$8	$0	
	Low-Permeability Asphalt		sf	$3	$0	
11	Vacuum Extraction					$35,000
	Mobilization	1	ls	$10,000	$10,000	
	Treatment	250	cy	$100	$25,000	
12	Confirmatory Sampling	84	ea	$275	$23,182	$23,182
13	Waste Profile Sampling	82	ea	$750	$61,500	$61,500
	TOTAL DIRECT CONSTRUCTION COSTS					$9,919,582
14	Engineering (10% except excavation and disposal at 5%)					$627,408
15	Oversight					$171,750
	Excavation	183	man/day	$750	$137,250	
	Capping		man/day	$750	$0	
	Treatment		man/day	$750	$0	
	Disposal	46	man/day	$750	$34,500	
16	Contingency (20 percent)					$2,143,748
	TOTAL INSTALLED CAPITAL COSTS					$12,862,488

Present Value Analysis for Operation and Maintenance Costs

Year	Cost Type	Cost Per Year	Discount Factor (7%)	Present Value	Notes
1-20	Annual O&M Cost	$20,000	10.593	$211,860	Semiannual groundwater monitoring
5	Periodic Cost	$10,000	0.713	$7,130	5-year review
10	Periodic Cost	$10,000	0.508	$5,084	5-year review
15	Periodic Cost	$10,000	0.362	$3,625	5-year review
20	Periodic Cost	$10,000	0.258	$2,584	5-year review

Total O&M Present Worth Costs (20 years at 7 percent)	$230,282
ESTIMATED PRESENT WORTH COST (20 years at 7 percent)	$13,092,770

Table 11- Estimated Cost Soil Alternative SL-2
Liberty Industrial Finishing Site, Farmingdale, New York

Item	Description	Quantity	Unit	Cost		Subtotal
1	Monitoring Well Installation					$24,000
	shallow wells (< 65 feet)	4	ea	$3,500	$14,000	
	deep wells (>65 feet)	2	ea	$5,000	$10,000	
2	Access Negotiation	1	ls	$10,000	$10,000	$10,000
3	Legal Fees	1	ls	$25,000	$25,000	$25,000
4	Mobilization/Demobilization	1	ls	$50,000	$50,000	$50,000
5	Site Preparation and Monitoring					$205,600
	Erosion Control	10	ac	$1,500	$15,000	
	Site Surveying	1	ls	$25,000	$25,000	
	Fencing (incl. 2 gates)	3,000	ft	$20.00	$60,000	
	Office and Construction Trailers	12	mo	$800	$9,600	
	Health and Safety Supplies	12	mo	$3,500	$42,000	
	Health and Safety Monitoring	12	mo	$2,500	$30,000	
	Utilities	12	mo	$1,000	$12,000	
	Supplies	12	mo	$1,000	$12,000	
6	Excavation	25,600	cy	$6	$140,800	$140,800
7	Backfill and Placement	30,720	cy	$25	$768,000	$768,000
8	Transport and Disposal (C code)	24,000	ton	$120	$2,880,000	$2,880,000
9	Transport and Disposal (D code)	14,400	ton	$40	$576,000	$576,000
10	Cover System					$1,141,875
	Section 360-type Cap		sf	$8	$0	
	Low-Permeability Asphalt	380,625	sf	$3	$1,141,875	
11	Vacuum Extraction					$60,000
	Mobilization	1	ls	$10,000	$10,000	
	Treatment	500	cy	$100	$50,000	
12	Confirmatory Sampling	39	ea	$275	$10,677	$10,677
13	Waste Profile Sampling	26	ea	$750	$19,500	$19,500
	TOTAL DIRECT CONSTRUCTION COSTS					$5,891,952
14	Engineering (10% except excavation and disposal at 5%)					$409,355
15	Oversight					$251,250
	Excavation	60	man/day	$750	$45,000	
	Capping	260	man/day	$750	$195,000	
	Treatment	0	man/day	$750	$0	
	Disposal	15	man/day	$750	$11,250	
16	Contingency (20 percent)					$1,310,511
	TOTAL INSTALLED CAPITAL COSTS					$7,863,068

Present Value Analysis for Operation and Maintenance Costs

Year	Cost Type	Cost Per Year	Discount Factor (7%)	Present Value	Notes
1-50	Annual O&M Cost	$35,000	13.800	$483,000	Quarterly inspection, semiannual groundwater monitoring, annual cap maintenance
5	Periodic Cost	$10,000	0.713	$7,130	5-year review
10	Periodic Cost	$580,938	0.508	$295,320	Major overhall of cover system, 5-year review
15	Periodic Cost	$10,000	0.362	$3,625	5-year review
20	Periodic Cost	$580,938	0.258	$150,126	Major overhall of cover system, 5-year review
25	Periodic Cost	$10,000	0.184	$1,843	5-year review
30	Periodic Cost	$580,938	0.131	$76,318	Major overhall of cover system, 5-year review
35	Periodic Cost	$10,000	0.094	$937	5-year review
40	Periodic Cost	$580,938	0.067	$38,795	Major overhall of cover system, 5-year review
45	Periodic Cost	$10,000	0.048	$476	5-year review
50	Periodic Cost	$580,938	0.034	$19,723	Major overhall of cover system, 5-year review
	Total O&M Present Worth Costs (50 years at 7 percent)			$1,077,291	

ESTIMATED PRESENT WORTH COST (50 years at 7 percent)	$8,940,359

APPENDIX IV

ADMINISTRATIVE RECORD INDEX

Note: This Administrative Record Index will be supplemented with additional documents that are in the Administrative Record relating to the Record of Decision for the Liberty Industrial Finishing site, but which have not yet been compiled and numbered for purposes of this Index.

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ADMINISTRATIVE RECORD FILE
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3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300001 - 300282 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 1 (Chapter 1.0 and 2.0), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 300283 - 300796 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 2 (Chapter 3.0 to 5.0), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 300797 - 301185 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 3 (Appendix A to G), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 301186 - 301425 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 4 (Appendix H to O), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 301426 - 301941 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5a (Appendix K-1), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 301942 - 302454 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5b (Appendix K-2), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 302455 - 302818 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5c (Appendix K-3), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 302819 - 303158 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5d (Appendix K-4), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 303159 - 303723 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97, 0203, Volume 5e (Appendix L-1), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 303724 - 304110 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5f (Appendix L-2 and L-3), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 304111 - 304612 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No, II CERCLA 97-0203, Volume 5g (Appendix L-4, L-5, and L-6), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 304613 - 304850 Report: Final Continued Remedial Investigation Report, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, Volume 5h (Appendix M-1, M-2, and M-3), prepared for U.S. EPA, Region II, prepared by URS, July 20, 2000.

P. 304851 - 305272 Report: Final Baseline Human Health Risk Assessment, Liberty Industrial Finishing Site, Farmingdale, New York, prepared for The Liberty Group, prepared by Eileen Mahoney Associates, Inc., under subcontract to Dames & Moore, July 2000.

P. 305273 - 305792 Report: Final Baseline Human Health Risk Assessment, Volume 2 (Appendices) Liberty Industrial Finishing Site, Farmingdale, New York, prepared for The Liberty Group, prepared by Eileen Mahoney Associates, Inc., under subcontract to Dames & Moore, July 2000.

P. 305793 - 305928 Report: Final Baseline Ecological Risk Assessment Report, Massapequa Creek and Preserve, Liberty Industrial Finishing Site, Farmingdale, New York, prepared for U. S. EPA, prepared by Roy F. Weston, Inc., August 18, 2000.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400212 Report: Final Feasibility Study Report for Soils and Groundwater, Liberty Industrial Finishing Site, Farmingdale, New York, Index No. II CERCLA 97-0203, prepared for U. S. EPA, Region II, prepared by URS, July 26, 2000.

4.6 Correspondence

P. 400213 - 400213 Letter to Michael Mensa, Esq., Office of Regional Counsel, U. S. EPA, Region II, from Mr. Anthony B. Quartararo, Assistant Counsel, NYS DEC, Division of Environmental Enforcement, re: Review of remedial alternative SL-5M as set forth in the draft Feasibility Study for the Liberty Industrial Finishing Site, June 28, 2000.

P. 400214 - 400223 Letter to Mr. Lorenzo Thantu, Work Assignment Manager, U. S. EPA, from Mr. Theodore Toskos, Site Manager, Roy F. Weston, Inc., re: Comments to the Draft Final Feasibility Study for Soils, Groundwater, and Pond Sediments, Liberty Industrial Finishing Site, Farmingdale, New York, Dated 1 June, 2000, August 25, 2000.

P. 400224 - 400255 Letter (with attachments) to Ms. Norma Robinson, Department of Legislative Affairs, Town of Oyster Bay, from Howard D. Avrutine, Esq., Goldstein & Avrutine, re: Town Board Application of Cubbies Properties, Inc. and J. Jay Tanenbaum for a Special Use Permit for Retail Use, Retail Gasoline Sales and Convenience Store Premises at Farmingdale - Section 48, Block 518, Lot 329, November 17, 2000.

P. 400256 - 400270 Letter (with attachments) to Ms. Aldona Lawson, Town Environmental Quality Review Commission, Town of Oyster Bay, from Howard D. Avrutine, Esq., Goldstein & Avrutine, re: Town Board Application of Cubbies Properties, Inc. and J. Jay Tanenbaum for a Special Use Permit for Retail Use, Retail Gasoline Sales and Convenience Store Premises at Farmingdale - Section 48, Block 518, Lot 329, November 21, 2000.

Note: The Administrative Record for Liberty Industrial Finishing Site OU1 and the Administrative Record for Liberty Industrial Finishing Site-Early Groundwater Action are incorporated into this Administrative Record by reference.

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3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001- 300198 Plan: Draft Final Work Plan for the Liberty Industrial Finishing Site, Farmingdale, New York, Remedial Investigation/Feasibility Study, prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., June 1991.

3.4 Remedial Investigation Reports

P. 300199- 300690 Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume I(a), prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994.

P. 300691- 301028 Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume I(b), prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994.

P. 301029- 301416 Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume II, Appendices, prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994.

P. 301417- 301500K Report: Baseline Risk Assessment Addendum, Liberty Industrial Finishing Site, Farmingdale, New York, prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., October 4, 1995.

P. 301501- 301744 Report: Final Report, Soil Sampling Investigation, Liberty Industrial Finishing Site, Farmingdale, N.Y., prepared for U.S. EPA/ERTC, Region II, prepared by Roy F. Weston, Inc., May 1997.

3.5 Correspondence

P. 301745- 301866 Memorandum to Mr. Lorenzo Thantu, Remedial Project Manager, New York Remediation Branch, U.S. EPA, Region II, thru Mr. Joseph Hudek, Team Leader, Superfund Contract Support Team, U.S. EPA Region II, from Mr. Michael A. Mercado, Environmental Scientist, Superfund Contract Support Team, U.S. EPA, Region II, re: Sampling Event Report for Liberty Industrial Finishing Site, Farmingdale, New York, May 6, 1997. (Attachment: Report: Sampling Report and Data Presentation, Liberty Industrial Finishing Site, Farmingdale, N.Y., Groundwater Sampling Event, October 30 - November 14, 1996, prepared by Mr. Michael A. Mercado, Environmental Scientist, Hazardous Waste Support Branch, U.S. EPA, Region II, undated.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001- 400365 Report: Draft Final Feasibility Study for Soils/Sludges and Debris in the Western Portion of the Liberty Industrial Finishing Site, Farmingdale, N.Y., prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., Revised July 1997.

6.0 STATE COORDINATION

6.3 Correspondence

P. 600001- 600001 Letter to Mr. Richard Caspe, Director, Emergency & Remedial Response Division, U.S. EPA, Region II, from Mr. Michael J. OToole, Jr., Director, Division of Environmental Remediation, New York State Department of Environmental Conservation (NYSDEC), re: Liberty Industrial Finishing, Site ID No. 130005, OU 1, Proposed Plan, July 8, 1997.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00016 Superfund Proposed Plan, Liberty Industrial Finishing Site, Town of Oyster Bay, Nassau County, N.Y., prepared by U.S. EPA, Region II, July 1997.

LIBERTY INDUSTRIAL FINISHING SITE
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2.0 REMOVAL RESPONSE

2.7 Correspondence

P. 200001-200068 Memorandum to Director, Waste Management Division, Regions I, IV, V, VII, VIII; Director, Emergency and Remedial Response Division, Region II; Director, Hazardous Waste Management Division, Regions III, VI, IX; Director, Hazardous Waste Division, Region X; Director, Environmental Services Division, Regions I, VI, and VII; Superfund Branch Chiefs, Regions I - X; Regional Counsels, Regions I - X, from Mr. Henry L. Longest II, Director, Office of Emergency and Remedial Response, re: Transmittal of Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA (Publication 9360.0-32), August 6, 1993. (Attachment: Report: Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA, prepared by U.S. EPA, August 1993.)

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300001-300188 Report: Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, EPA-540-G-89-004 OSWER 9355.3-01, prepared by U.S. EPA, October 1988.

P. 300189-300196 Report: Guidance for Presumptive Remedies: Policy and Procedures, EPA 540-F-93-047, prepared by U.S. EPA, September 1993.

Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume I(a), prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994. (**Note**: This document is in the Liberty Industrial Finishing Site, Operable Unit One, Administrative Record.)

Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume I(b), prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994. (**Note**: This document is in the Liberty Industrial Finishing Site, Operable Unit One, Administrative Record.)

Report: Final Remedial Investigation Report for the Liberty Industrial Finishing Site, Farmingdale, New York, Volume II, Appendices, prepared for U.S. EPA, Region II, prepared by Roy F. Weston, Inc., January 1994. (**Note**: This document is in the Liberty Industrial Finishing Site, Operable Unit One, Administrative Record.)

P. 300197- 300283 Report: Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, Final Guidance, EPA 540-R-96-023 OSWER 9283.1-12, prepared by U.S. EPA, October 1996.

3.5 Correspondence

Memorandum to Mr. Lorenzo Thantu, Remedial Project Manager, New York Remediation Branch, U.S. EPA, Region II, thru Mr. Joseph Hudek, Team Leader, Superfund Contract Support Team, U.S. EPA, Region II, from Mr. Michael A. Mercado, Environmental Scientist, Superfund Contract Support Team, U.S. EPA, Region II, re: Sampling Event Report for Liberty Industrial Finishing Site, Farmingdale, New York, May 6, 1997, (Attachment: Report: Sampling Report and Data Presentation, Liberty Industrial Finishing Site, Farmingdale, N.Y., Groundwater Sampling Event, October 30 - November

14, 1996, prepared by Mr. Michael A. Mercado, Environmental Scientist, Hazardous Waste Support Branch, U.S. EPA, Region II, undated.) (**Note:** This Memorandum and attachment is in the Liberty Industrial Finishing Site, Operable Unit One, Administrative Record.)

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001- 400095 Report: Draft Focused Feasibility Study and Preliminary Engineering Design and Cost Analysis, In-Situ Groundwater Remediation, Liberty Industrial Finishing Site, Farmingdale, New York, prepared by Dames & Moore Group Company, prepared for Coltec Industries, Inc., December 4, 1997.

P. 400096- 400259 Report: Final Focused Feasibility for Interim Groundwater Action, Liberty Industrial Finishing Site, Farmingdale, New York, prepared by Roy F. Weston, Inc., prepared for U.S. EPA, Region II, January 5, 1998.

6.0 STATE COORDINATION

6.3 Correspondence

P. 600001- 600001 Letter to Mr. Richard Caspe, Director, Emergency and Remedial Response Division, U.S. EPA, Region II, from Mr. Michael J. O'Toole, Jr., Director, Division of Environmental Remediation, New York State Department of Environmental Conservation, (NYSDEC), re: Liberty Industrial Finishing, Site ID NO. 130005, Proposed Interim Groundwater Response Action, December 31, 1997.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00007 Plan: Superfund Program Proposed Response Action, Liberty Industrial Finishing Site, Farmingdale, Town of Oyster Bay, Nassau County, New York, EPA Proposes Interim Groundwater Action, prepared by U.S. EPA, Region II, December 1997.

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2.0 REMOVAL RESPONSE

2.3 EE/CA Approval Memorandum (for non-time-critical removals)

P. 200069-200071 Memorandum to Ms. Betsy Shaw, Director, Regions 2/6 Accelerated Response Center, from Mr. John La Padula, P.E., Chief, New York Remediation Branch, Emergency and Remedial Response Division, EPA, Region II, re: Interim Response Action at Liberty Industrial Finishing Superfund Site, November 13, 1997. (Attached: Attachment to Memorandum from Mr. John La Padula, P.E., Chief, New York Remediation Branch, Emergency and Remedial Response Division, U.S. EPA, Region II, to Betsy Shaw, Director, Regions 2/6 Accelerated Response Center, re: Liberty Industrial Finishing Site, Planned Interim Action, undated.)

P. 200072-200073 Letter to Mr. Richard Craig, P.E., Program Manager, Roy F. Weston, Inc., from Mr. Richard J. Conti, Contract Specialist, re: Revision No. 21 to Work Assignment No. 09-2LT3, Liberty Industrial Finishing Site, New York, December 30, 1997. (Attached: EPA ARCS Work Assignment Form, Liberty Industrial Finishing Site, Remedial Investigation/Feasibility Study, Contractor: Roy F. Weston, Inc., Revision No.: 21).

2.4 EE/CA

Report: Final Focused Feasibility Study for Interim Groundwater Action, Liberty Industrial Finishing Site, Farmingdale, New York, prepared by Roy F. Weston, Inc., prepared for U.S. EPA, region II, January 5, 1998. (This document can be found in the Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File, pages 400096 - 400259).

2.5 Action Memorandum

P. 200074- 200138 Action Memorandum, Liberty Industrial Finishing Superfund Site, Farmingdale, Nassau County, New York, prepared by U.S. EPA, Region II, March 1998. (Attachments: Attachment I. Engineering Evaluation/Cost Analysis (can be found in the Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File, pages 400096 - 400259); and Attachment II. Responsiveness Summary, with the following five appendices: Appendix A - Proposed Response Action Document, Appendix B - Public Notices published in the Farmingdale Observer and the Massapequa Post, Appendix C - January 21, 1998 Public Meeting Attendance Sheets, Appendix D - January 21, 1998 Public Meeting Transcript (Section 10.4 in this Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File Update, pages 10.00196-10.00350); and Appendix E- Comments Received During the Public Comment Period (Section 10.1 Comments and Responses of this Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File Update, pages 10.00007A-10.00173.))

6.0 STATE COORDINATION

6.3 Correspondence

P. 600002- 600002 Letter to Mr. Michael O'Toole, P.E., Director, Division of Environmental Remediation, New York State Department of Environmental Conservation, from G. Anders Carlson, Ph.D., Director, State of New York Department of Health, Bureau of Environmental Exposure Investigation, re: Draft Action Memorandum, Liberty Industrial Finishing Site, March 27, 1998.

10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses

P. 10.00007A- 10.00001A Letter to Mr. Marsden Chen, Division of Environmental Remediation, NYS Department of Environmental Conservation, from Mr. William F. Barton, Chief, Bureau of Consistency Review and Analysis, NYS Waterfronts, re: the proposed remediation of the Liberty Industrial Finishing Site and the discharge of remediated groundwater to Massapequa Creek, January 14, 1998.

P. 10.00007B- 10.00007B Comments from Ms. Betsy Seiden re: meeting on groundwater, January 21, 1998.

P. 10.00007C- 10.00007E Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Richard J. Baldwin, C.P.G., Senior Hydrogeologist, H2M Group, re: South Farmingdale and Massapequa Water Districts, Liberty Industrial Finishing Site, January 26, 1998. (Attached: Statement made on behalf of the South Farmingdale and Massapequa Water Districts at the January 21, 1998 public meeting).

P. 10.00007F- 10.00007F Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Rose Hobbins, President, North Massapequa Civic Association, Inc., re: request that Alternative 2 - Groundwater Pumping/Treatment be used for an interim groundwater action at the Liberty Industrial Finishing Site, January 27, 1998.

P. 10.00007G- 10.00007G E-mail message to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. M. Lisa O'Shea, resident, re: opinion on the method of cleaning up the Liberty Industrial Finishing Site, January 29, 1998.

P.	10.00008- 10.00008	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Herbert Alpert, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00009- 10.00009	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. John Antonucci, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00010- 10.00010	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Glenn Arnold, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00011- 10.00011	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Joan Aspromonte, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00012- 10.00012	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Louis J. Auletti, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00013- 10.00013	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Iolanda Bauco, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00014-	Letter to Mr. Lorenzo Thantu, Project Manager,

10.00014 Eastern New York Remediation Section, U.S. EPA, from Mrs. Miriam Baum, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00015- 10.00015 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. John Belsito, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00016- 10.00016 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Michael A. Biscuiti, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00017- 10.00017 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Karl H. Bleck, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00018- 10.00018 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Richard Bloeth, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00019- 10.00019 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Josephine Bontko, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00020- 10.00020 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA,

from Ms. Susan Boyle, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00021- 10.00021	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Madeline Buscarimo, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00022- 10.00022	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Edward Butler, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00023- 10.00023	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Rocco Calise, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00024- 10.00024	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. R. Cartier, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00025- 10.00025	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Mary Ciccarelli, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00026- 10.00026	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. William Cleary, resident, re: concerns

in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00027- 10.00027	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Nancy Coby, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00028- 10.00028	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Marilyn Cohen, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00029- 10.00029	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Samuel Cohen, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00030- 10.00030	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Debra Cohen-Siedstein, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00031- 10.00031	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Marianna Colucci, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00032- 10.00032	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Jean Columbo, resident, re: concerns in regards to the interim groundwater action proposed

by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00033- 10.00033 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. John J. Connolly, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00034- 10.00034 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Rosemarie Consolo, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00035- 10.00035 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Robert Czarnecki, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00036- 10.00036 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Ben D'Amprisi Jr., residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00037- 10.00037 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Glenn DeBona, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00038- 10.00038 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Mary M. Deibler, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty

Industrial Finishing Site, February 1, 1998.

P.	10.00039- 10.00039	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Frank Dellaquila, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00040- 10.00040	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Angela DeRosa and Mr. Vincent DeRosa, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00041- 10.00041	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from J. Dluzneski, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00042- 10.00042	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Rita Donnelly, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00043- 10.00043	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. James Edgette, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00044- 10.00044	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Anne Eibach, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial

Finishing Site, February 1, 1998.

P.	10.00045- 10.00045	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Sarafino Faranello, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site; February 1, 1998.
P.	10.00046- 10.00046	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Jean Fisher, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00047- 10.00047	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Kathleen Flynn, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00048- 10.00048	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Seymour L. Fuchs, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00049- 10.00049	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Kathleen Fullerton, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00050- 10.00050	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Andrew Galgano, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00051- 10.00051	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Lena Galli, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00052- 10.00052	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Pasquale Gammello, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00053- 10.00053	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Frank L. Garofalo, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00054- 10.00054	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Francine Garofalo-Saginario, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00055- 10.00055	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Dominick Giovanniello, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00056- 10.00056	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Robert Goldwyn, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00057- 10.00057 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Beatrice Gottlieb, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00058- 10.00058 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Vincent Guercio, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00059- 10.00059 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Lisbeth Heiner and Mr. Horst Heiner, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00060- 10.00060 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. George Henry, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00061- 10.00061 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Virginia C. Hiller, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00062- 10.00062 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Isidore Hoffman, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00063-10.00063	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Albert J. Hugyak, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00064-10.00064	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Mary Kachmar, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00065-10.00065	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Vivian Kahn, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00066-10.00066	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. John Kolomechuk and Ms. Mary Rose Kolomechuk, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00067-10.00067	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Richard Kopitsch, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00068-10.00068	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Walter Lane, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00069- 10.00069 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Nanette Linsalata, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00070- 10.00070 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Elaine LoBue, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00071- 10.00071 Letter to Mr. Lorenzo Thantu, Project manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Carolyn LoCastro, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00072- 10.00072 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Nancy LoCastro, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00073- 10.00073 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Richard LoPresti, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00074- 10.00074 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Linda Mastropasqua, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00075- Letter to Mr. Lorenzo Thantu, Project Manager,

10.00075 Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. John Mayer, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00076- 10.00076 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. John Mazzola and Ms. Leona Mazzola, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00077- 10.00077 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Dennis McGarvey, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00078- 10.00078 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Jane McNulty, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00079- 10.00079 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Sean McNulty, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00080- 10.00080 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Paul McSloy and Ms. Emilie McSloy, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00081- 10.00081 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Ginamarie Mercante, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00082- 10.00082 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Kevin Merola, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00083- 10.00083 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Alfred Michalowski, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00084- 10.00084 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Franca Mills, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00085- 10.00085 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Adella E. Molnia, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00086- 10.00086 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Eileen Moran, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00087- Letter to Mr. Lorenzo Thantu, Project Manager,

	10.00087	Eastern New York Remediation Section, U.S. EPA, from Pat Mosomillo, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00088- 10.00088	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. William F. Murphy, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00089- 10.00089	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. George Mushitski, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00090- 10.00090	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Toby B. Nachbar, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00091- 10.00091	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Jerry S. Nachbar, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00092- 10.00092	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Newbeck, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00093-	Letter to Mr. Lorenzo Thantu, Project Manager,

10.00093 Eastern New York Remediation Section, U.S. EPA, from Mr. Michael T. O'Shea, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00094- 10.00094 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. M. Lisa O'Shea, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00095- 10.00095 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Beth Pantaleo, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00096- 10.00096 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. V. Parente, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00097- 10.00097 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Kathleen Parsons, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00098- 10.00098 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Doreen Perretta, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00099- Letter to Mr. Lorenzo Thantu, Project Manager,

10.00099 Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. W. Petraitis, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00100- 10.00100 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. A. Presti, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00101- 10.00101 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Margaret Pristina, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00102- 10.00102 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Laura Proppe, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00103- 10.00103 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Albert V. Pucciarelli, Jr., resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00104- 10.00104 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Fritz Raetz, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00105- 10.00105 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA,

from Ms. Beatrice Rasum, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00106- 10.00106	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. John A. Reilly, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00107- 10.00107	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Gina Ring, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00108- 10.00108	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Christina Risi, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00109- 10.00109	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Natalie Rogan, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00110- 10.00110	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Eileen T. Ruesterholz, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00111- 10.00111	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Charles J. Russo, residents, re:

concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P.	10.00112- 10.00112	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Ira Salz, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00113- 10.00113	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. William A. Sanders, resident, re: concern in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00114- 10.00114	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Louise C. Schinnerer, LRT, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00115- 10.00115	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Leon Schwartzman, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00116- 10.00116	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Kathy Schwettmann, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.
P.	10.00117- 10.00117	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Martin Skrocki, resident, re: concerns in regards to the interim groundwater action

proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00118- 10.00118 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Eleanor Smith, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00119- 10.00119 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Edward Smith, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00120- 10.00120 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Norma Solenick and Mr. Michael Solenick, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00121- 10.00121 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Filomena Soriano, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00122- 10.00122 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Peter Spadalik, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00123- 10.00123 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Peter G. Speciale, resident, re: concerns in regards to the interim groundwater action

proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00124- 10.00124 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Maria Spiciarich, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00125- 10.00125 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Ottillie G. Starke, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00126- 10.00126 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Rosemarie and Mr. John Stauber, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00127- 10.00127 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Christopher Sullivan, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00128- 10.00128 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Donald J. Taffurelli, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00129- 10.00129 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Ira Taller, resident, re: concerns in regards to the interim groundwater action

proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00130- 10.00130 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. George W. Tourtoulis, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00131- 10.00131 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Gabriel P. Vitale, Ms. Teresa Errigo Vitale, Ashley, Samantha, and Nicholas Vitale, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00132- 10.00132 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Marion Warmingham, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00133- 10.00133 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mrs. Madeline Warren, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00134- 10.00134 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Susan Weilhofer and Mr. Edward Weilhoefer, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00135- 10.00135 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA,

from Mr. Richard W. Wesp, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00136- 10.00136 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Barbara Whaley, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00137- 10.00137 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Cliff Williamson, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00138- 10.00138 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. and Mrs. Irwin Wolf, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00139- 10.00139 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Lori Wozny, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00140- 10.00140 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from The Wozny Family, residents, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 1, 1998.

P. 10.00141- 10.00142 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, Emergency and Remedial Division, U.S. EPA, from Ms. Diane L.

Lasurdo, Acting Chairperson, Citizens for Pure Water, re: response to the "Interim Groundwater Action" alternatives meeting held on January 21, 1998, Liberty Industrial Finishing Superfund Site, February 2, 1998.

P.	10.00143- 10.00144	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Betty Seiden, resident of Farmingdale, re: comments on the Proposed Interim Groundwater Action, February 2, 1998.
P.	10.00145- 10.00146	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Merlene Ryndfleisz, Bob's Electrical Contracting Corporation, re: EPA's proposal for alternative #3 for the Liberty Industrial Finishing Site February 4, 1998.
P.	10.00147- 10.00147	Letter to Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Michael Grello, resident of Farmingdale, re: comments on EPA's proposal for interim groundwater response action, Liberty Industrial Finishing Site, February 5, 1998.
P.	10.00148- 10.00148	E-mail to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. William A. Bostrum, resident, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 9, 1998.
P.	10.00149- 10.00149	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Anthony J. Sabino, Deputy Town Attorney, Town of Oyster Bay, and Mr. John A. Paider, Town Attorney, Town of Oyster Bay, re: Proposed Interim Groundwater Action, Liberty Industrial Finishing Site, February 11, 1998.
P.	10.00150- 10.00150A	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA,

from Mr. Keith Gambino, resident of Farmingdale, re: EPA's proposal for alternative #2 for the Liberty Industrial Finishing Site, February 17, 1998. (Note: Missing page(s)).

P.	10.00151- 10.00151	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Ms. Denise Veracka, resident of Farmingdale, re: recommendation to use alternative 2 at the Liberty Industrial Finishing Site, February 18, 1998.
P.	10.00152- 10.00152A	Comments to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Melvin Brenner, re: the Proposed Interim Groundwater Action, February 19, 1998. (Note: Missing page(s)).
P.	10.00153- 10.00158	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. George J. Weiner, Counsel for 55 Motor Avenue Co., Cubbies Properties, Inc. and J. Jay Tanenbaum, re: response to the December, 1997 notice of EPA's proposal to conduct an "interim groundwater action" at the Liberty Industrial Finishing Site, February 20, 1998.
P.	10.00159- 10.00166	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Robert M. Lucas, Esquire, Environmental Counsel, Beazer East, Inc., re: Liberty Industrial Finishing Site-Proposed Interim Groundwater Action, February, 21, 1998.
P.	10.00167- 10.00168	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Robert J. Knapp, Koch Industries, Inc., Legal Department, re: concurrence with Beazer's comments on the Proposed Interim Groundwater Action, February 23, 1998.
P.	10.00169- 10.00169	Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA,

from Ms. Suzanne Grossman, resident of Farmingdale, re: concerns in regards to the interim groundwater action proposed by the EPA for the Liberty Industrial Finishing Site, February 25, 1998.

P. 10.00170- 10.00173 Letter to Mr. Lorenzo Thantu, Project Manager, Eastern New York Remediation Section, U.S. EPA, from Mr. Ralph Golia, Principal, and Mr. Matthias Ohr, Project Geologist, Dames and Moore, re: Public Comment on Proposed Response Action, Interim Groundwater Action, Liberty Industrial Finishing Site, Farmingdale, Nassau County, New York, February 27, 1998.

10.2 Community Relations Plans

P. 10.00174- 10.00184 Plan: Community Relations Plan (Revised March 1998), Liberty Industrial Finishing Superfund Site, Farmingdale, Nassau County, New York, prepared by U.S. EPA, Region II, March 1998.

10.3 Public Notices

P. 10.00188- 10.00190 Letter to Mr. Lorenzo Thantu, Work Assignment Manager, U.S. EPA, Region II, from Mr. Theodore Toskos, Site Manager, Roy F. Weston, Inc., re: Copies of the News Paper Notices, 21 January 1998 Public Meeting, Liberty Industrial Finishing Site, Farmingdale, New York, February 17, 1998. (Attached: 1. "Public Notice: The United States Environmental Protection Agency Announces Proposed Interim Groundwater Action and Availability of the Administrative Record File for the Liberty Industrial Finishing Superfund Site, Farmingdale, New York", posted in The Massapequa Post, January 7, 1998; and 2. "Public Notice: The United States Environmental Protection Agency Announces Proposed Interim Groundwater Action and Availability of the Administrative Record File for the Liberty Industrial Finishing Superfund Site, Farmingdale, New York” posted in the Farmingdale Observer, January 9, 1998).

P. 10.00191- 10.00195 Letter to Mr. Lorenzo Thantu, Work Assignment Manager, U.S. EPA, Region II, from Mr. Theodore Toskos, Site Manager, Roy F. Weston, Inc., re: Public Notice Tearsheets, Liberty Industrial Finishing Site, Farmingdale, New York, April 14, 1998. (Attached: 1. Public Notice: "EPA Extends Public Comment Period for the Liberty Industrial Finishing Superfund Site in Farmingdale, New York", posted in the Farmingdale Observer, February 6, 1998; and 2. Public Notice: "EPA Extends Public Comment Period for the Liberty Industrial Site in Farmingdale, New York", posted in the Massapequa Post, February 11, 1998.)

10.4 Public Meeting Transcripts

P. 10.00196- 10.00350 Letter to Mr. Lorenzo Thantu, Work Assignment Manager, U.S. EPA, from Mr. Theodore Toskos, Site Manager, Roy F. Weston, re: Final Transcript and Report, 21 January 1998 Public Meeting, Liberty Industrial Finishing Site, Farmingdale, New York, April 3, 1998. (Attached: 1. Report: Liberty Industrial Finishing Site, Public Meeting - January 21, 1998, prepared by Roy F. Weston, Inc.; and 2. Transcript: Public Meeting on The Proposed Interim Groundwater Action, Liberty Industrial Finishing Site, Farmingdale, New York, January 21, 1998 at 7:00 p.m., Parkway Elementary School, 95 Woodward Parkway, Farmingdale, New York, prepared by National Reporting Incorporated.)

P. 10.00351- 10.00362 Agenda and meeting overheads for the Public Meeting on The Proposed Interim Groundwater Action, Liberty Industrial Finishing Site, Farmingdale, New York, January 21, 1998.

10.6 Fact Sheets and Press Releases

P. 10.00363- 10.00364 Fact Sheet: Public Availability Session: For the July 1997 Proposed Plan for Soils in the Western Portion (operable Unit I), Liberty Industrial Finishing Site, Town of Oyster Bay, Nassau County, New York, prepared by EPA, Region II, September

11, 1997.

P. 10.00365- 10.00365 News Release: "EPA Delays Soil Cleanup Decision at Liberty Industrial Superfund Site in Farmingdale, Long Island", prepared by U.S. EPA, Region 2, For Release: October 9, 1997.

10.7 Responsiveness Summary

See Section 2.5 Action Memorandum, Attachment II, March 1998, for Responsiveness Summary.

11.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

11.1 EPA Headquarters

Report: Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, EPA-540-G-89-004 OSWER 9355.3-01, prepared by U.S. EPA, October 1988. (NOTE: This document can be found in the Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File, pages 300001 - 300188).

P. 11.00001- 11.00037 Report: Superfund Removal Procedures, Public Participation Guidance for On-Scene Coordinators: Community Relations and the Administrative Record, prepared by U.S. EPA, Headquarters, July 22, 1992.

Report: Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, prepared by U.S. EPA, August 1993. (NOTE: This document can be found in the Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File, pages 200001 - 200068).

Report: Guidance for Presumptive Remedies: Policy and Procedures, EPA 540-F-93-047, prepared by U.S. EPA, September 1993. (NOTE: This document can be found in the Liberty Industrial Finishing

Site Early Groundwater Action Administrative Record File, pages 300189 - 300196).

Report: Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, Final Guidance, EPA 540-R-96-023 OSWER 9283.1-12, prepared by U.S. EPA, October 1996. (NOTE: This document can be found in the Liberty Industrial Finishing Site Early Groundwater Action Administrative Record File, pages 300197 - 300283).

11.4 Technical Sources

P.	11.00038- 11.00049	Report: SITE Technology Capsule, Unterdruck-Verdampfer-Brunnen Technology (UVB) Vacuum Vaporizing Well, prepared by U.S. EPA, Office of Research and Development, July 1995.

NOTE: The documents listed on the attached indices for the Liberty Industrial Finishing Site Operable Unit 1 (OU 1) Administrative Record File and the Liberty Industrial Finishing Early Groundwater Action Administrative Record File are hereby incorporated by reference into this Liberty Industrial Finishing Early Groundwater Action Administrative Record File Update.

The Administrative Records for Liberty Industrial Finishing Site can be located at the following repositories:

Farmingdale Public Library
116 Merritt Road
Farmingdale, New York 11735

Superfund Remedial Records Center
290 Broadway, 18th Floor
New York, New York 10007 - 1866

APPENDIX V

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

MAR 28 2002

Mr. Richard L. Caspe
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Floor 19 - #E38
290 Broadway
New York, NY 10007-1866

Dear Mr. Caspe:

Re: Draft Final Record of Decision; Liberty Industrial Finishing, Nassau County (Site ID No. 130005)

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has reviewed the Draft Final Record of Decision (ROD) for the Liberty Industrial Finishing site and finds it acceptable. The following are the key components of the primary remedy:

- Excavation and off-site disposal of all contaminated soils above groundwater protection levels, estimated at 73,100 cubic yards, and removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features,

- Capture and treatment of the contaminated groundwater at three locations using conventional pump-and-treat technology, and,

- Excavation and off-site disposal of contaminated sediments from Pond A of the Massapequa Creek.

It is also our understanding that, based upon discussions among the NYSDOH, NYSDEC, and the United States Environmental Protection Agency, additional surface soil sampling will be performed during the design phase of the remedial program for this site to ensure its acceptability for recreational use. Finally, agreement was reached that PCB contaminated soils will be remedied to New York State guidance levels (i.e., one mg/kg for surface soils and 10 mg/kg for subsurface soils), and the Eastern portion of the site will be restricted to industrial and appropriate commercial uses.

If you have any questions or comments on this matter, please contact Mr. Sal Ervolina at (518) 402-9706.

Sincerely,

Michael J. O'Toole, Jr.
Director
Division of Environmental Remediation

cc: R. Caspe, USEPA
D. Garbarini, USEPA-Region II
L. Thantu, USEPA-Region II
G. Litwin, NYSDOH
R. Fedigan, NYSDOH

APPENDIX VI

LIST OF POTENTIALLY RESPONSIBLE PARTIES

Liberty Industrial Finishing Site
Identities of Potentially Responsible Parties[1]

1. Coltec Industries, Inc.[2]
2. Department of Defense
3. General Services Administration
4. Liberty Aero, Inc.
5. Beazer East, Inc.
6. Liberty Industrial Finishing Corp.
7. Koch Industries, Inc.
8. Liberty Associates, NJ limited partnership
9. William Heller
10. Jerome Lazarus
11. Jan Burman
12. J. Jay Tanenbaum
13. Jefry Rosmarin
14. Cubbies Properties, Inc.
15. 55 Motor Avenue Company

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[1] Northrop Grumman Corporation (successor to Grumman Corporation) has been identified by EPA as a PRP for the Liberty site. However, in June 2001, in a litigation among the Liberty site PRPs (but not involving EPA), a federal district court judge held that Northrop Grumman Corporation was not liable with respect to the Liberty site. EPA was advised by certain of the other PRPs that they may seek to appeal that decision.

[2] In July 1999, Coltec Industries, Inc. was acquired by Goodrich Corporation (formerly known as BF Goodrich). EPA will determine whether Goodrich Corporation should be added as a PRP.

<u>APPENDIX VII</u>

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
Liberty Industrial Finishing Superfund Site
Farmingdale, Nassau County, New York

INTRODUCTION

A responsiveness summary is required by the regulations promulgated under the Superfund Statute. It provides a summary of citizens' comments and concerns received during the public comment period, as well as the responses of the United States Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document will be considered by EPA in its final decision regarding the selection of a long-term comprehensive remedy for the Liberty Industrial Site (the Site).

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The supplemental remedial investigation and feasibility study (RI/FS) reports and the Proposed Plan were released to the public on April 10, 2001 and July 23, 2001, respectively. The July 2001 Proposed Plan, the supplemental RI/FS reports, and all other documents and information upon which the selected remedy is based were made available to the public in the administrative record file at the EPA Records Center in Region II, located at 290 Broadway, 20th Floor, New York, and also at the information repository established and maintained at the Farmingdale Public Library, located at 116 Merritt Road, Farmingdale, New York. The notice of the public meeting and availability of the above-referenced documents appeared in two newspapers, Newsday and the Farmingdale Observer on July 23, 2001 and July 27, 2001, respectively. These notices also announced a public comment period on the July 2001 Proposed Plan and supporting documentation from July 23, 2001 through August 22, 2001. The notice, as well as the July 2001 Proposed Plan, were also mailed to close to 700 interested parties on the Site mailing list. A press release announcing the public meeting and comment period was issued on August 1, 2001. On August 9, 2001, EPA held a public meeting at the Farmingdale Public Library to discuss remedial alternatives, to present EPA's preferred remedial alternatives, and to provide an opportunity for the interested parties to present comments and questions to EPA.

Per the public's request at the August 9, 2001 public meeting, EPA extended the public comment period by 30 additional days to September 21, 2001 and scheduled a separate public availability session for September 13, 2001. The notice of the public availability session and extension of the public comment period to September 21, 2001 appeared in the Farmingdale Observer and Massapequa Observer on August 24, 2001, August 31, 2001, and September 7, 2001, and in Newsday on August 28, 2001. The notice was also mailed to all interested parties on the Site mailing list. A press release announcing the same was issued on August 22, 2001.

However, because EPA's Region II office was closed due to the terrorist attacks on the World Trade Center (WTC), the September 13, 2001 public availability session was postponed. Also, because some public comments sent by regular mail were likely not received due to the closing of the postal facility in lower Manhattan, EPA further extended the public comment period to January 25, 2002 and rescheduled the public availability session for January 9, 2002. The notice of the public availability session and the public comment period extension appeared in the Farmingdale Observer and Massapequa Observer on December 14, 2001, December 21, 2001, and January 4, 2002, and in Newsday on December 12, 2001. The notice was also mailed to parties on the Site mailing list. EPA held the public availability session at the Farmingdale Public Library, to provide additional information and another opportunity to respond to comments and questions community members had regarding the proposed remedial alternatives.

Responses to the comments and questions received at the public meeting, along with other written comments received during the public comment period, are included in this Responsiveness Summary. Attached to this Responsiveness Summary are the following Appendices:

- Attachment 1 - Proposed Plan
- Attachment 2 - Public Notices
- Attachment 3 - August 9, 2001 Public Meeting and January 9, 2002 Public Availability Session Attendance Sheets
- Attachment 4 - August 9, 2001 Public Meeting and January 9, 2002 Public Availability Session Transcripts
- Attachment 5 - Letters Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND RESPONSES

Numerous comments were received on the supplemental RI/FS reports and the July 2001 Proposed Plan at the public meeting and the public availability session and throughout the public comment period. Comments and concerns raised by interested parties including members of the public relate to the use of innovative technologies for the comprehensive groundwater remedy; the discharge of treated groundwater; the extent of the Massapequa Creek remedy; human health and risk assessment issues; enforcement-related issues; however, the majority of comments received related to the preferred soil remedy. While there was a general sentiment among the commentors at the public meeting and the public availability session that EPA's preferred remedy was much improved relative to the preferred remedy described in the 1997 Proposed Plan, there was extreme dissatisfaction with preferred soil remedy, particularly with the component of the preferred remedy that would leave nearly 50,000 cubic yards of contaminated soils at the Site covered by an impermeable cap.

EPA received more than 400 letters, electronically and in writing, as well as verbal comments requesting that EPA change the proposed alternative for soil remediation from Alternative SL-2 (which would involve excavation and off-Site disposal of approximately 25,600 cubic yards of contaminated soils and capping of other lesser contaminated soils) to SL-3 (which would involve excavation and off-Site disposal of all contaminated soils that could potentially impact groundwater). Concerns were expressed over the long-term effectiveness of the 8.75-acre capping component of Alternative SL-2, with commentors asserting that the proposed cap would ultimately fail because effective cap maintenance, required to ensure the integrity of the cap and remedy, could not be guaranteed. The commentors insisted that Alternative SL-3 should be selected because it is a permanent remedy that minimizes the potential threat to the sole source aquifer underlying the Site which serves as the drinking water supply for 44,000 people, and because it is more reliable than Alternative SL-2 in protecting human health and the environment. EPA also received oral and written comments from the elected representatives of the community unanimously requesting that EPA select Alternative SL-3 for many of the same reasons cited by the community members. During the comment period EPA also became aware that the Town of Oyster Bay (Town) had taken significant steps towards formalizing plans to acquire nearly all of the western portion of the Site, including the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town also requested that EPA select Alternative SL-3, because they felt Alternative SL-2 would be incompatible with the recreational uses planned for the property proposed for acquisition. Further discussions and written information provided by the Town resulted in EPA's determination that SL-2 would interfere with the Town's ability to use the park over the short and long term. This information caused EPA to reevaluate Alternative SL-2 and SL-3 against the criteria listed in the NCP which EPA uses to evaluate remedies including: permanence and long-term effectiveness. Based upon this reevaluation and the evaluation criterion of "community acceptance", EPA determined that Alternative SL-3 should be the selected remedy contingent upon the Town's acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6 to 8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy. In the event that Alternative SL-2 becomes the selected remedy, EPA will provide written notice to all stakeholders on the EPA mailing list for the Site.

Because of the large number of letters received advocating the selection of SL-3, EPA decided to begin its response to comments by addressing these comments first in Section A of this Responsiveness Summary.

The specific comments have been organized as follows:

- a. Soil Remedy
  - i. Public Concerns Stated in an Electronic Form Letter of which EPA Received over 140 copies
  - ii. Information Received from the Town Regarding their Acquisition and Use of Part of the Site
  - iii. Investigation Data
  - iv. Cleanup Goals
  - v. Implementation
  - vi. Cap Effectiveness
  - vii. Costs of Alternatives
  - viii. Institutional Controls
- b. Groundwater Remedy and Water Quality
- c. Massapequa Creek Remedy
- d. Risk Assessment
  - i. Groundwater
  - ii. Health and Safety
  - iii. Baseline Ecological Risk Assessment
- e. Other

A. Soil Remedy

Public Concerns Stated in an Electronic Form Letter of which EPA Received over 140 copies

1. **Comment:** Alternative SL-3 should be selected since it would provide permanent protection to the health of local residents and minimize further potential harm to the environment and threat to the drinking water.

   Response: EPA agrees that Alternative SL-3 is a more permanent remedy than Alternative SL-2 since it would not require a long-term inspection and maintenance program and would also enable the property to be utilized for parkland or commercial/light industrial use without limitations. It is also true that Alternative SL-3, through complete soil excavation and off-Site disposal, could be a more protective remedy over the long-term because it would eliminate any further contamination of the groundwater in the future.

2. **Comment:** The $4.15 million in additional costs associated Alternative SL-3 to remove all the contaminants in the soil, instead of capping a portion of it, is well worth the peace of mind and well being of Farmingdale residents and the 44,000 people who get their water from Farmingdale wells. Alternative SL-3 is the most protective of our public health and the environment.

   Response: This comment relates to four of nine criteria that EPA utilizes in its remedy selection process namely, protection of human health and the environment, long-term effectiveness and permanence, cost and community acceptance. A brief synopsis of the nine criteria and other remedy selection considerations will facilitate a response to this comment. EPA evaluates remedial alternatives against nine evaluation criteria. The first two criteria (Overall Protection of Human Health and the Environment, and Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)) are considered "threshold" criteria; alternatives must satisfy these threshold criteria. The next five criteria (long-term effectiveness; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost) are considered "primary balancing" criteria and are used to make comparisons and to identify the major trade-offs between alternatives. The last two criteria (state acceptance and community acceptance) are considered "modifying" criteria and are considered fully after the formal public comment period on the Proposed Plan has ended. EPA also seeks to select remedies that utilize permanent solutions and treatment or recovery to the maximum extent practicable, as well as remedies that allow sites to be put back into productive uses consistent with local zoning and planning objectives.

   EPA appreciates the communities' concerns and understands the preference for a remedy that will provide permanent protection over the long term and thereby provide peace of mind. EPA believes that like Alternative SL-3, Alternative SL-2 is protective of human health and, if implemented as designed, would also be protective of the groundwater resource. Alternative SL-2 provides this protection at a cost which is approximately 68% of Alternative SL-3. With regard to the other balancing criteria, Alternative SL-2 and Alternative SL-3 are similar, though Alternative SL-3 would provide a greater degree of long-term effectiveness and permanence. Under these circumstances a $4.15 million or 32% cost difference, is not an insignificant consideration, though it is less than the cost difference ($6 million) that EPA evaluated in the Proposed Plan. While the community would certainly prefer Alternative SL-3 over Alternative SL-2, the community acceptance criterion alone, under the circumstances, might not warrant the Agency's selection of SL-3. However, during the comment period EPA learned that the Town is in the process of acquiring a significant portion of the Liberty property for parkland use. Alternative SL-2 would be incompatible with the Town's planned uses of the property over the short and long term. The change in future land use coupled with the fact that Alternative SL-3 would be more protective and permanent over the long term and is widely acceptable to the public, caused EPA to reevaluate the soils alternatives and select Alternative SL-3. The selection of Alternative SL-3, however, is contingent upon the completion of the Town's acquisition of the property for parkland. Please refer to Response to Comment 3 for more details.

Information Received from the Town Regarding Acquisition of Part of the Site, Planned Uses for the Site Relative to the Soil Remedy

3. **Comment:** The Town of Oyster Bay indicated that it has long considered acquiring a portion of the Liberty Industrial Site to expand its over utilized Ellsworth Allen Park which shares a property line with the Site. In September 2000, the Town authorized the issuance of $20 million of bonds to raise funds to acquire real property for recreational and parkland use in the Town. This bond was called the Save Environmental Assets (SEA) Fund. On July 31, 2001, one week after the release of the Proposed Plan, the Town Board met to consider a recommendation to allocate $5 million of SEA money to acquire title to the western portion of the Liberty Site, and the Town Board voted to authorize the use of the SEA fund for such acquisition. The Town has initiated eminent domain proceedings, which are expected to result in the acquisition of nearly all of the western portion of the Site; the Town will hold a public hearing on the condemnation on April 2, 2002. The Town's planned uses for the property include walking/nature trail and sensory gardens, a picnic area, cabins and campgrounds for Boy Scout outings etc. The development of the property would be phased in over a period of 10 years or more. This would result in disruption of

significant portions of the property for trenching (utilities and irrigation), digging (for the planting of trees and shrubbery) and excavation (for the building of rest room facilities, cabins, trails, etc.)

Response: It is clear from documentation received from the Town that the SL-2 remedy would be incompatible with the Town's planned uses for the property. Based upon this information, and several other considerations related to criteria which EPA uses to evaluate remedies including: protection of human health and the environment, long-term effectiveness and permanence, and community acceptance (see Response to Comments 1 and 2, above), EPA has selected Alternative SL-3 for the remediation of the western Site soils contingent upon the Town's acquisition of the property. If the Town does not complete the acquisition process within a time frame of approximately 6-8 months, or otherwise satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy.

Investigation Data

4. **Comment:** What are the analytical results for the Building B Ramp soils? When will those soils be removed?

   Response: The soil excavated during construction of the Building B ramp by the Site owner was placed on the former Building N pad. The stockpile contains elevated concentrations of cadmium and chromium above levels that are protective of groundwater (10 mg/kg cadmium and 143 mg/kg chromium). Cadmium was present at 518 mg/kg, and chromium was present at 9,730 mg/kg in a sample from the wall of the ramp excavation. The soil was stockpiled to a height of about 5 feet on an area of the pad that is approximately 50 feet by 40 feet. The volume of contaminated soils has been estimated at 530 cubic yards, all of which would be removed for off-Site disposal under either Alternative SL-2 or SL-3. In order to expedite the removal of these soils, EPA has included their removal in a March 2002 Administrative Order on Consent (AOC) with the property owners. EPA expects that these soils would be removed by the Fall of 2003.

5. **Comment:** Historical aerial photographs, particularly those from 1966, suggest that drums may have been stored on the undeveloped easternmost four-acre area near Building U. Additional investigations and remediation may be required.

Response: EPA used photo documentation in developing the Supplemental RI Work Plan. Contractors trained to interpret historical photos for areas of potential hazardous substance storage or disposal, or other suspicious features, did identify a disturbance in the area. As part of the supplemental RI, a geophysical survey, soil-gas survey and soil borings and sampling were conducted in this area. These investigations did not produce any evidence that soils on the undeveloped easternmost four-acre area east and south of Building U have been contaminated. These activities and associated analytical results are described in detail in the Supplemental RI Report.

6. **Comment:** Several members of the public expressed concern that the investigations conducted by EPA to date on the eastern portion of the Liberty Site (e.g., northern and eastern sanitary leaching fields) are not sufficient and requested that EPA oversee the property owner's planned development on the easternmost 10 acres of the Site.

Response: EPA believes that the level of investigation of the 15-acre eastern portion of the Site, including the easternmost 10 acres for which the property owner's development activities are being planned, was appropriate for remedy selection purposes. The results of these investigations are detailed in two reports.

The initial RI report was completed in January 1994 and a supplemental RI report was completed in May 2001. The initial RI and the supplemental RI reports, combined, comprehensively define much of the soil contamination at the entire Site, including the eastern portion of the Site, groundwater contamination, and localized contamination in pond sediments in Massapequa Creek downstream of the Site. In all, close to three thousand environmental samples (e.g., soil, groundwater, and soil gas) were collected. Of them, nearly 200 samples were collected from the easternmost 10 acres. These data demonstrate that approximately 95% of the contaminated soils are located on the 15-acre western portion of the Site. This finding is consistent with the historical use of the Site in that waste disposal and manufacturing operations were concentrated in the 15-acre western portion and the 5-acre central portion that abuts the easternmost 10 acres. The 15-acre western portion of the Site, being undeveloped, had always been used as a waste disposal area.

Nonetheless, EPA acknowledged in the Proposed Plan that there were some features (e.g., three underground storage tanks (UST) and several subsurface features such as vaults, drains, and sumps) that could not be fully investigated during the RIs due to inaccessibility. EPA is requiring that these underground storage tanks and subsurface features at the Site be addressed as part of the comprehensive remedy unless any such features are addressed pursuant to the AOC with the property owners referenced in the Response to Comment 4 above. This AOC removal action addresses remediation of most of the subsurface features, and USTs, on the eastern portion of the Site (See **Figure RS-1**) as well as the removal of the former Building B Ramp Pile. As part of this removal action, EPA will also require that additional sampling and analysis be conducted on the eastern sanitary leaching fields and a portion of the northern eastern sanitary leaching fields and that any additional contamination above established soil cleanup levels be removed for off-Site disposal. EPA will also ensure the performance of additional investigation of the portion of the northern leaching field not addressed under the AOC.

Cleanup Goals

7. **Comment:** Why isn't EPA cleaning the soils to residential standards?

Response: Under the Superfund program, the remedy selection process must take into account the most reasonably anticipated future use of the property. EPA utilizes its May 25, 1995 Land Use Guidance to determine the reasonably anticipated future land use. In 1997, EPA determined that use to be commercial-industrial for the Liberty Site. Commercial-industrial land use was determined to be the most reasonably anticipated future land use for the Site because the Site was zoned for industrial use beginning in the 1920's and was used in that manner until the mid-1980's when the industries that had operations on that portion of the Site ceased. Since that time, light industrial uses have included trucking, warehousing, automobile parts salvaging operations, and product distribution, and these continue to this day. In addition, the property owners indicated that they had no intention of developing the property for residential use. Furthermore, there was no comprehensive master land use plan covering the area, which would indicate that the property would be used for purposes other than commercial/industrial uses. In 1999, the Town informed EPA of its interest in acquiring the far western portion of the property to expand

Ellsworth Allen Park. Based on information from the Town of Oyster Bay's May 7, 1998 Preliminary Assessment of Utilizing the Western Portions of the Liberty Industrial Finishing Site for parkland, EPA considered recreational use of the far western portion of the property to be a reasonably anticipated future use (note: no remediation was envisioned for this area as it was deemed to be relatively free of contamination). As a result, soil cleanup numbers were developed for the Site to prevent contaminants in the soil from continuing to impact groundwater, and to ensure protection of the health of individuals frequenting areas of the Site under the most reasonably anticipated future land uses (commercial/industrial for the eastern half of the property, and commercial/industrial and recreational for the western half of the property. After EPA issued the Proposed Plan, the Agency learned from the Town that it planned to acquire nearly all of the western portion of the property for recreational use by expansion of the Ellsworth Allen Park. The selected remedy, SL-3, will also permit such use.

8. **Comment:** Would changing the zoning to residential change the cleanup goals and the proposed remedy?

   Response: The comment is purely hypothetical in nature, and, based upon comments received from Town officials and community members, is not a land use that would be viable for this particular property.

9. **Comment:** Many commentors expressed concern that Alternative SL-2 would not be protective of groundwater and wondered if SL-2 was appropriate for a site located in a sole-source-aquifer designated area.

   Response: Alternative SL-2, the contingency remedy, which combines the selective removal of the most significantly-contaminated soils with capping, eliminates the potential for contaminant leaching and impact to groundwater and, therefore, would be protective of groundwater. This alternative would be appropriate for a site located in a sole-source aquifer. It should be noted that while this alternative does include a cap, it would result in the removal of approximately 80% of Site-wide chromium and cadmium contaminant mass.

<u>Cap Effectiveness and Maintenance</u>

10. **Comment:** What is the expected long-term performance of the cap described in SL-2.

Response: Cap systems are a well-understood and easy to implement technology. At the Site, a combination of engineered caps (such as an asphalt cap) and/or building structures would provide a long-term cap. Cap systems can operate at high efficiency for long periods of time. The service life of cap system can be long (several decades or longer) if inspected and maintained regularly.

11. **Comment:** How often would the Site be inspected to ensure the integrity of the cap under Alternative SL-2?

    Response: If Alternative SL-2 were implemented as the contingency remedy the frequency of inspections would likely be quarterly. However, the frequency of inspections would be determined during actual engineering design and would be based on factors such as the recommendations of the manufacturers of the various component systems and the performance characteristics of the design.

12. **Comment:** Commentors requested additional details on how EPA would ensure that the cap would be maintained and monitored technically to ensure its long-term effectiveness if SL-2 were implemented.

    Response: Once a final design is chosen, the proper function of the asphalt cap would be primarily monitored and judged by the observed structural integrity of the cap. If the cap remains structurally intact, then it can be assumed that the permeability design criteria continue to be met. If the structural integrity of the cap is compromised or failing, then it can be assumed that the permeability design criteria are no longer being met. Therefore, the monitoring program would consist of visual inspections of the asphalt cap, performed on a quarterly basis. In addition, a comprehensive groundwater monitoring program would be implemented to evaluate the effectiveness of source removal and cover system proposed in SL-2. Asphalt integrity would be primarily evaluated by the absence/presence of cracks, punctures, settlement or potholes, and joint separation. The proper function of the associated storm water management system would be evaluated by the absence/presence of ponded water within the extent of the cap and blockage of storm water inlets, swales, or curbing by debris or sediments. Any problems that would suggest failure or compromised structural integrity of the cap surface would be corrected by appropriate measures such as patching the cracked areas or replacing the compromised sections. Ponding or settlement would indicate failure at the base level of the cap, which would be corrected by rebuilding or stabilizing the failing base.

Costs of Soil Alternatives

13. **Comment:** A resident noted that significant cost-savings would be realized under the SL-3 alternative if the excavations are not backfilled, making the SL-3 costs closer to that of Alternative SL-2 and thereby allowing SL-3 to be implemented.

Response: The excavations necessary to remove the contaminated soils under Alternative SL-3 would be deep, up to approximately 20 feet below grade. If they are not backfilled, then the Site cannot be reused. Leaving such large excavations open would create significant safety concerns. Furthermore, if the excavations remain open, they could become recharge ponds and potentially alter the groundwater conditions in unpredictable ways such as accelerating plume migration or causing the plume to change direction of migration.

14. **Comment:** A representative of the Massapequa Water District commented that the District has evaluated the Proposed Plan's Alternatives SL-2 and SL-3 cost estimates and that, if the nonhazardous soil could be used as daily cover at a nearby landfill, and if recycled aggregate could be utilized in place of soil backfill, the cost difference between Alternatives SL-2 and SL-3 would be $2.5 million instead of the Proposed Plan's $6 million.

Response: EPA appreciates the efforts taken by the commentors to come up with approaches to reduce the cost differential between Alternatives SL-2 and SL-3. One of the critical cost assumptions used in this estimate is that the nonhazardous soil could be used as alternate grading material (AGM) for landfill closure or daily cover at a Long Island Landfill at a cost of $30/ton; the proximity of such a landfill to the Site is also critical to this savings estimate, since transportation costs would be reduced. If local facilities were available to take the material at the time the remedy is implemented, a significant cost savings could be realized under both Alternative SL-2 and SL-3. However, in developing cost estimates EPA must evaluate the disposal market as a whole, not a particular niche in the market which may not be available at the time construction is occurring. As a result, EPA cannot assume that a nearby market would exist for use of this material as a daily cover or AGM when the remedy is implemented. EPA has similar concerns regarding the availability of a local source of recycled aggregate. In addition, EPA has serious technical concerns relating to the tendency for recycled aggregate to settle with time, as well as for its potential to result in gradual pH changes.

However, EPA acknowledges that there has been a continual decline in disposal costs for both hazardous and nonhazardous soils and, therefore, decided to reevaluate market costs for disposal of this material, to see if conditions have changed over the past year since the cost estimates were developed. Current information indicates that disposal costs have declined somewhat over the last year from $55/ton to $40/ton for nonhazardous contaminated soils and from $145/ton to $120/ton for disposal of soils as hazardous waste. EPA calculated new disposal estimates for the hazardous and nonhazardous materials to be disposed of under Alternatives SL-2 and SL-3. The results indicated that total disposal costs for SL-2 would decrease from $4,272,000 to $3,456,000, while total disposal costs for SL-3 would decrease from $8,182,500 to $6,840,000. This reduced the differential in disposal costs between SL-2 and SL-3 by more than $500,000.

15. **Comment:** One commentor suggested that had EPA used a different, more realistic interest rate as a discount factor, the present value of the future cost of the operation and maintenance of the cap under Alternative SL-2 would have been greater than EPA projected in the Proposed Plan, with the result that the cost differential between Alternatives SL-2 and SL-3 would be reduced.

    Response: In conformance with its July 2000 guidance document entitled, "Guide to Developing and Documenting Cost Estimates During the Feasibility Study" EPA recalculated the costs of the soil alternatives utilizing a discount rate of 7%, assumed a 50 (rather than 20) year time frame, and included a category encompassing periodic costs which might be incurred during the long-term maintenance of the cap under Alternative SL-2. EPA also considered the decreased disposal costs, discussed above. The new present worth cost estimates are now $8,940,000 and $13,093,000, for Alternatives SL-2 and SL-3 respectively. This represents a cost difference of $4,153,000, which is $1,841,000 lower than the present worth estimate presented in the Proposed Plan.

Institutional Controls

16. **Comment:** Many commentors expressed concern about the possibility that the Site could be developed for residential use in the future subsequent to remedy implementation and wanted to know how EPA could ensure this did not occur, particularly if SL-2 were implemented.

Response: In choosing the remedial action for the Site, EPA has assumed that the reasonably anticipated future land use for the Site would be commercial/industrial or recreational for a part of the western portion of the Site. At the availability session, the Town and members of the public suggested that successful residential development of this property was not viable.

Prior to the July 2001 issuance of its proposed plan, EPA was aware that the property owner had applied to the Town for a special use permit to allow a multi-million dollar commercial development on the eastern portion of the Site and, as discussed above, EPA was advised recently that the Town of Oyster Bay was planning to acquire all or most of the western portion of the Site for recreational use by expanding the adjacent existing Ellsworth Allen Park. EPA is selecting SL-3 as the soil remedy for the Site on the assumption that the future Site use will be commercial/industrial or recreational. The ROD has also conditionally selected SL-2 in the event that the Town of Oyster Bay does not go forward to acquire the western portion of the Site for recreational purposes. But, in either event, to ensure that the Site is not used for residential purposes, the Record of Decision includes an "institutional control," or a requirement that the property owner agree for itself and for future owners not to permit a residential use of the Site. EPA plans to have the PRPs implement the remedy by entering into a judicial Consent Decree or, failing that, by EPA issuing an administrative order to the PRPs. The Consent Decree or administrative order would require implementation of the "institutional control" through deed restrictions placed on the property. EPA could enforce the "institutional control" in court.

If, in the future, a property owner wanted to use the Site for residential purposes and if the Town of Oyster Bay authorities supported such use, then the property owner could apply to EPA and the State of New York to remove the residential restriction and EPA could assess at that future time what additional steps would be needed to make the Site safe for residential development and, if appropriate, EPA could issue an amended Record of Decision, with full public participation, permitting a residential use.

17. **Comment:** Many commentors questioned the effectiveness of institutional controls. They requested that EPA provide details on how the SL-2 cap would be maintained and monitored institutionally to ensure its long-term effectiveness, particularly in the case of a property sale.

Response: If the contingency remedy SL-2, is implemented, EPA would be the agency that oversees the implementation and maintenance of an effective cap at the Liberty Industrial Finishing Site. As noted in the previous response, EPA expects that the PRPs will implement the remedy pursuant to a judicial Consent Decree or administrative order. In either case, EPA will require the preparation of an inspection and maintenance plan. EPA would seek to require that the Site owner grant an easement, running with the land, permitting the maintenance of the cap and granting sufficient access to maintain the cap. Thus, the property would be subject, in perpetuity, to restrictions permitting the maintenance of the cap regardless of the identity of a future owner. Under either a consent decree or administrative order it would be the PRPs, who have the obligation to maintain the cap. If the PRPs fail or refuse to implement the remedy, EPA would evaluate its statutory enforcement tools to compel such implementation.

B. Groundwater Remedy and Water Quality

18. **Comment:** Is my water safe to drink?

Response: Residents in the area obtain their drinking water from public drinking water supplies operated by the Massapequa and South Farmingdale Water Districts. The two closest downgradient public supply well fields are located a mile and a half down gradient of the Site. The water supply wells in these well fields are several hundred feet deep. It should be noted that the groundwater in the vicinity of the Site is generally contaminated to a depth of about 100 feet (i.e., shallow Upper Glacial Aquifer), except in one localized area between Fallwood Parkway and the Woodward Parkway Elementary School where the groundwater is contaminated to a depth of approximately 180 feet. Regular testing of the groundwater obtained from the public supply wells indicates that the water quality meets all State and Federal drinking water standards. This testing has never indicated that any well has been impacted by the groundwater contamination associated with the Liberty Site. As a precautionary measure, EPA and the water districts also joined in a collaborative effort and installed six sentinel monitoring wells upgradient of the water districts' well fields in the Spring of 1998. These sentinel wells serve as an early warning system should any plume of contamination migrate close to the well fields. The water districts' periodic monitoring of these sentinel wells has not detected any Site-related contaminant.

19. **Comment:** Can the Liberty groundwater contaminant plume impact down gradient water supply wellfields?

    Response: Analytical and modeling data generated during the Supplemental RI indicate that the Liberty plume has not impacted down gradient groundwater supply wellfields and that under the current hydrogeologic conditions the plume will not impact these supplies in the future. In the interim, the water districts are continuing to sample a series of sentinel wells to ensure that contaminated groundwater does not enter the water supply wells; the selected remedy is incorporating the sampling of these wells as part of the Site groundwater monitoring program (see **Comment24**, below).

20. **Comment:** Representatives from Woodward Parkway Elementary School and the Farmingdale High School requested that EPA clarify the proposed locations of the two extraction well clusters to be installed down gradient of the Liberty property.

    Response: The specific locations of the extraction well clusters will be determined during the RD/RA. One of the two extraction well clusters would be optimally located near the Woodward Parkway Elementary School (between Woodward Parkway and the headwaters of the Massapequa Creek) and the other near the Massapequa Creek just south of 7th Avenue, near present monitoring well cluster MW-9. The extraction well cluster near the Woodward Parkway Elementary School would be installed approximately 60 feet deep in the Upper Glacial aquifer and the extraction well cluster near the present monitoring well cluster MW-9, to the northwest of the Farmingdale High School, would be installed approximately 180 feet deep in the Magothy aquifer.

21. **Comment:** Representatives of the Woodward Parkway Elementary School and the Farmingdale High School were concerned about one of the two locations being considered for the treatment of

the off-property groundwater. They requested that properties adjacent to the school grounds be excluded as possible locations for off-Site groundwater remediation systems due to the potential for greater short and long-term impacts on the community. They believed EPA should select the second of the two locations considered, i.e., the Liberty property.

Response: EPA acknowledges these concerns. While measures could be taken to mitigate the short and long-term impacts associated with construction of the treatment system on property adjacent to the Woodward Parkway Elementary School, EPA agrees that it would be preferable to treat this contamination at the place of origin at the Liberty property. The selected remedy reflects this modification.

22. **Comment:** Commentors requested that the proposed groundwater remedy, Alternative GW-2, be replaced with Alternative GW-3, based on operational problems that have impacted the reliability and effectiveness of the existing on-Site interim groundwater treatment system that employs an innovative groundwater circulation well technology.

    Response: EPA agrees that the existing on-Site interim groundwater treatment system has had operational problems over the past year and a half that have prevented the system from continuous operation and effective treatment of groundwater contamination. Many groundwater treatment systems experience problems during the first year of operation. At the time the Proposed Plan was released (July 2001) EPA was expecting to be able to rectify many of the system problems. Unfortunately, the operational problems for this innovative system could not be worked out in a reasonable time frame, nor were solutions readily identified. As a result, in January 2002 EPA directed the PRPs to begin the process of converting the on-Site system into a conventional pump and treat system. Subsequently, at the January 2002 availability session, EPA informed the public that Alternative GW-2 was being replaced with Alternative GW-3 as the Agency's preferred groundwater remedy. Alternative GW-3 is the selected groundwater remedy.

23. **Comment:** Representatives of the South Farmingdale and Massapequa Water Districts requested that the ROD require that the water districts be provided on a monthly basis with copies of the operating logs and tabulated monitoring data for the on-Site and off-Site treatment systems.

    Response: EPA will provide this information as requested.

24. **Comment:** Representatives of the South Farmingdale and Massapequa Water Districts commented that the continued monitoring of the six sentinel monitoring wells that were installed up gradient of their well fields (South Farmingdale Water District plant 2 and Massapequa Water District northeast well fields) in the Spring of 1998 in a collaborative effort between EPA and the water districts, be integrated with the Site groundwater remedy.

Response: As noted above, modeling performed during the Supplemental RI indicates that the Liberty plume is in equilibrium, i.e., it is not expanding, and should not reach the public supply wells. Nonetheless, EPA believes that it would be prudent to monitor the sentinel wells rather than rely on the results of the model. Therefore the monitoring of these wells will be included as part of the Site groundwater monitoring program for a minimum of five years.

25. **Comment:** Commentors, including several associated with the Nassau County Stream Augmentation Project, requested that the long-term comprehensive groundwater system discharge treated groundwater to the Massapequa Creek rather than reinject it into the aquifer. They indicated that this would provide a significant, added benefit to restoration of the stream flow within the Massapequa Creek.

Response: EPA will fully evaluate the feasibility of discharging treated groundwater to the Massapequa Creek as part of the remedial design activities for the comprehensive groundwater remedy. If this option is found to be feasible, treated groundwater will be discharged to the Massapequa Creek.

C. Massapequa Creek

26. **Comment:** A representative of the Nassau County Department of Public Works requested that EPA expand the Proposed Plan's Pond A sediment remedy to include excavation and disposal of all contaminated sediments within the Massapequa Preserve that are attributed to the Liberty site.

Response: EPA's investigation of the Massapequa Creek and Preserve consisted of surface water sampling, stream and pond sediment sampling, sediment toxicity (bioassay) testing, fish sampling, and macroinvertebrate studies. As part of the sediment sampling, samples were also collected from all six ponds for Toxicity Leachate Characteristics Procedure (TCLP) analysis to determine whether any of the sediments are hazardous waste, as regulated by the Resource Conservation and Recovery Act (RCRA); the TCLP analytical results indicate that none of the pond sediments are RCRA hazardous by characteristic. All of this information was then utilized to perform an ecological risk assessment. The ecological risk assessment concluded that only Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish. In addition, Pond A, being located furthest upstream and closest to the Liberty Site, was found to have the greatest potential to be affected by contaminated groundwater discharge from the Liberty Site in terms of observed contamination and also was found to be acting as a source of contamination to the five lower ponds. Remediation of Pond A will prevent this pond from acting as a source of contamination to the downstream ponds.

Nevertheless, to ensure that Pond A remedy is protective of the entire Massapequa Creek and Preserve, including the five lower ponds, the remedy will be integrated with an enhanced monitoring program for the remainder of the lower ponds that will consist of periodic surface water and sediment sampling and bioassays. EPA believes that this program will further support its determination that only Pond A requires remediation, and demonstrate that removal of the contaminant source in Pond A will have a beneficial effect on downstream pond sediment quality.

27. **Comment:** One of the PRPs questioned the validity of EPA's rationale used to justify remediation of Pond A, asserting that there was insufficient scientific evidence to justify the proposal.

Response: EPA disagrees. As noted above, the ecological risk assessment concluded that Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish. While EPA acknowledges that the commentor does not agree with the findings of the ecological risk assessment, EPA believes the findings of this assessment are technically valid; responses to the specific technical concerns on the ecological risk assessment are detailed in Section **D.iii. of this Responsiveness Summary.** It should also be noted that Pond A, being located furthest upstream and closest to the Liberty Site, was found to have the greatest potential to be affected by contaminated groundwater discharge from the Liberty Site in terms of observed contamination and also to be acting as a source of contamination to the five lower ponds. Remediation of Pond A will prevent this pond from acting as a source of contamination to the downstream ponds.

D. Risk Assessment

Groundwater

28. **Comment:** Has the potential exposure to VOCs, via volatilization of VOCs in shallow groundwater into soil gas vapor and then into structures, been evaluated for off-Site residences and buildings? Have soil gas samples been taken off-Site? Has the indoor air been tested for VOC contamination in nearby schools? Have these potential exposures been considered in determining the hypothetical cancer risk and other potential health impacts for off-Site areas?

    Response: The potential for exposure to VOCs that have volatilized from the groundwater to indoor air was evaluated. This evaluation did not include sampling of indoor air. Sampling of soil gas was performed across the street from the Liberty property; results did not indicate the presence of VOCs. Concentrations of contaminants detected in the groundwater below the eastern and western portions of the Liberty Site, and in the groundwater downgradient of the Liberty property (in the residential neighborhood) were modeled to predict concentrations that could result in indoor air of buildings on the Liberty property and homes in the neighborhood. Cancer risks and noncancer hazards were determined, using conservative estimates of exposure such as assuming 24 hour/day exposure to indoor air. The resulting cancer risks and noncancer hazards from exposure to the indoor air were within or below EPA's acceptable levels. It should be noted that there has been significant discussion in the environmental field regarding the effectiveness of the models that evaluate this mechanism of indoor air contamination and whether additional measures should be taken to enhance information generated from existing modeling (e.g., selective indoor air sampling, soil gas sampling or development of models that can incorporate additional Site specific conditions). EPA Region 2 is currently beginning an effort to review characteristics of its groundwater contamination sites to ensure that the groundwater/vapor intrusion pathway has been appropriately considered; the Liberty Site will also be considered in this evaluation.

29. **Comment:** Analytical data suggest that the Farmingdale High School irrigation well is contaminated. Is there a risk to

the public from its use? What measures is EPA taking to prevent its use?

Response: EPA contacted the Nassau County Department of Health (NCDOH) concerning this well. Contaminants present in this irrigation well are not attributed to the Liberty Site. Sampling results indicate the presence of low levels of a few VOCs (e.g., cis-l,2-dichloroethene (cis-l,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE)). The contaminants have been detected at very low-level concentrations that marginally exceed the 5 micrograms/liter (ug/l) drinking water standard. Given the intended irrigation use (i.e., for watering surrounding playing fields), NCDOH indicated there would be very limited, if any, human exposure to the groundwater, and any potential risks to human health are expected to be minimal. Therefore, EPA does not intend to restrict the use of this well. Additional questions regarding this well should be directed to the NCDOH, which can be reached at **(516) 571-3323**.

30. **Comment:** The public questioned whether cancer incidence in the area is related to the Site, and whether an epidemiological study has been conducted.

Response: The New York State Department of Health (NYSDOH) staff has conducted an epidemiological study for the zip codes 11701, 11735 (zip code for the Liberty Site), 11758 and 11762 in Nassau and Suffolk Counties during the years 1983 to 1992. This study does not show a significant difference in the expected verses the observed number of cancers for these zip code areas. Additional details on this study can be found in its report entitled, "April 2000 Cancer Incidence Study." Interested parties can also call Ms. Aura Weinstein of the NYSDOH Cancer Surveillance Program at 1-800-458-1158 extension 42354 for further information.

Health and Safety

31. **Comment:** What is the risk to a future construction worker?

Response: The risk assessment assumed that the future construction worker would be exposed to Site constituents during construction activities through direct dermal contact with soil and liquids, incidental ingestion of the soil from hand-to-mouth contact, settling of dust in the oral and nasal passages or inhalation of vapors. The primary exposure route driving the cancer risk to construction workers was dermal contact with semivolatile organic compounds, benzo(a)pyrene and dibenzo(a,h)anthracene, which were found in the aqueous waste in some of the subsurface features, but are not prevalent in the soils at the Site. Also of concern were noncancer risks for a construction worker subject to dermal contact with chromium and PCB (Arolclor 1260) in soils and aqueous waste.

32. **Comment:** Is it safe to eat the fish from Massapequa Preserve?

Response: The baseline human health risk assessment included an evaluation of the potential ingestion of fish exposed to cadmium, chromium and lead (which is not Site-related and is believed to have been introduced into the Massapequa Creek via urban runoff). Potential health risks for such ingestion of fish were found to be within EPA's acceptable levels for children and adults. It needs to be noted, however, that a NYSDOH sportfish consumption advisory is in effect for the Upper Massapequa Reservoir, due to non-Site-related chlordane, a pesticide, and polychlorinated biphenyls (PCBs) present in edible fish species, particularly white perch, collected from the Massapequa Reservoir. The Upper Massapequa Reservoir is in the Massapequa Preserve and is just north of Sunrise Highway (Route 27), about 2.5 miles downstream of the headwaters to Massapequa Creek. The NYSDOH advises that women of childbearing age, infants and children under the age of 15 should not eat any fish species taken from this body of water and upstream in Massapequa Creek to the first barrier impassable by fish. Other individuals are advised to eat no more than one meal per month of white perch from these waters. The main chemical of concern associated with the advisory is chlordane, but polychlorinated biphenyls (PCBs) were also detected.

33. **Comment:** What are the short-term concerns to construction workers and the public during remedial activities?

Response: During construction activities, workers may come in contact with contaminated soils and groundwater. However, Site workers will be provided with proper protective gear, during construction, to mitigate exposure to contaminated soils and groundwater. Proper engineering control measures, such as dust suppression, will be implemented during construction, to prevent off-Site contaminant migration. The public would also be subject to nuisance impacts typically associated with construction activities e.g., noise, truck traffic etc. These nuisance impacts can also be moderated by taking such efforts as limiting the hours of construction activity, the routes taken by trucks coming and going from the Site, and the times that trucks would be allowed enter and leave the Site.

Baseline Ecological Risk Assessment

This section summarizes extensive comments submitted by a PRP on EPA's August 18, 2000 Final Baseline Ecological Risk Assessment (BERA) and EPA's responses to those comments. It should be noted that the BERA was initially drafted by the PRPs, however, due to the inadequacies in the draft BERA, EPA tasked its contractor Roy F. Weston to revise the BERA in conformance with EPA's risk assessment policies and guidances.

In general the PRP felt that data was omitted in the BERA, that there were flaws in the derivation of potential risks to ecological receptors, and that interpretations of the data were either flawed or were based on worst-case possible outcomes. As a result, the PRP felt that remediation of Pond A was unjustified. EPA risk assessment policy relies on conservative assessments in order to support management decisions that minimize ecological risks, especially in situations where significant uncertainty exists. EPA does not believe that BERA conclusions were based upon on worst-case possible outcomes; though EPA does acknowledge that, consistent with its guidance, management decisions were made to address uncertainties and thereby minimize potential ecological risks. A summary of EPA's rationale for remediating Pond A is provided in the response to **Comment #27** above. In the remainder of this section, EPA responds to those concerns raised by the PRP which it feels are relevant to the remedy selection process.

34. **Comment:** EPA should not have screened individual samples against the Ambient Water Quality Criteria. In screening of surface water it is standard practice to screen against the upper confidence limit (UCL) of the mean surface water concentration of each water body, and to exclude any areas that do not support fish.

Response: EPA disagrees. Data on the number of individual samples that exceed particular screening criteria and the extent to which they exceed criteria can provide useful information regarding the potential for ecological risks. The exclusion of areas that do not support fish from screening against EPA Ambient Water Quality Criteria for the Protection of Aquatic Life is not justifiable since the Ambient Water Quality Criteria are created to be protective of all aquatic biota, not just fish.

35. **Comment:** The BERA is unclear on the fact that aluminum, cobalt, copper and lead are not Site-related.

Response: These chemicals were initially listed in the BERA as Site-related because their concentrations in surface water were higher in closer proximity to the Liberty Site. However, further review of groundwater data versus surface water data indicates that they are not likely to be Site-related.

36. **Comment:** The NYSDEC Severe Effect Level (SEL) should have been utilized for screening potential risks related to sediments.

Response: EPA does not agree that the NYSDEC SEL is a suitable screening value for evaluation of potential risks. According to EPA Region II policy, the NYSDEC Lowest Effect Level (LEL) is the value typically used in a screening assessment to determine if there is a potential for risk. Contaminants of potential concern are then identified on the basis of those chemicals either exceeding the guidelines or those for which no guidelines occur. These chemicals are retained in the baseline risk assessment for evaluation of complete exposure pathways using a variety of assessment and measurement endpoints. In the event that there is significant uncertainty associated with a risk assessment, such data may still be used in making risk management decisions regarding a site.

37. **Comment:** EPA's data interpretation regarding benthic macroinvertebrate community structure is flawed. The diversity seen in Pond A was no better or worse than at the reference location which was approved by EPA and NYSDEC.

Response: The fact remains that the sample with the lowest diversity was collected at Pond A location PA-03. As two samples were collected by the PRP to characterize the entire pond, a conservative approach was taken by EPA toward interpreting the results. EPA believes that these conservative inferences were warranted and justifiable based upon the data set. Although the reference location was initially agreed to by EPA and NYSDEC, the results of the benthic community assessment indicated that the reference location was impacted and, therefore, was considered not appropriate for comparison purpose. Nevertheless, the benthic community data indicated that Pond A had the lowest diversity and richness compared to the other ponds. For example, amphipods were found in the downstream ponds and not in Pond

A.

38. **Comment:** Total Organic Carbon (TOC) and particle size should have been considered further in determining the bioavailabilty of contaminants. In addition, acid volatile sulfides (AVS) data were omitted from the BERA; if the data had been used, they would have indicated that the contaminants were not bioavailable.

Response: It is recognized that TOC and particle size may influence the ultimate bioavailability of metals in sediments (as mentioned in Section 4.6.2 of the BERA). However, only the SEL values incorporate TOC as a measure of bioavailability, and only for certain organic compounds; no such screening guidelines are available for metals. In addition, the relationship between TOC and bioavailability is further acknowledged in Section 5 of the BERA, where it is noted that it would be difficult to extrapolate bioassay results from one pond to another based upon variability in these parameters within and between ponds. One of the significant remaining data gaps in this assessment is the degree to which toxicity varies within and between ponds based upon these characteristics.

EPA does not believe that the AVS data presented by the PRP provide meaningful data for inclusion in the BERA, and, therefore, excluded the data from the BERA. The rationale is simply that AVS is most relevant to contaminant mobility in the anoxic zone below 2 inches of the sediment/water interface. While AVS may influence metals mobility in that zone, it should not significantly influence the bioassay results, or benthic macro invertebrate community structure, which were used to evaluate contaminated sediment in this assessment. AVS cannot be considered to be the sole influence affecting metals availability; bioturbation and other factors disturbing the sediment surface in natural systems often negate what is found in laboratory systems. It should be noted that even if the PRP's own AVS data were included, they indicate that cadmium is bioavailable in Pond A sufficient to cause toxicity.

39. **Comment:** The conservative statement that the sediment concentrations tested in the bioassay were below the maximum sediment concentrations reported in Pond A, and that, therefore, organisms could be exposed to much higher concentrations, is not appropriate. It is virtually impossible to duplicate the single highest concentration ever measured

when collecting sediments for bioassays and the fact that the highest concentration was not tested is statistically irrelevant; the 95% UCL better reflects concentrations found in the pond.

Response: The fact remains that the highest concentration reported was nearly twice that of the 95% UCL cited within the PRP's comments. Unlike fish, benthic macroinvertebrates are relatively sessile, and would be exposed to the individual contaminant concentrations measured in the sediment, not an average or a UCL. Depending on the dose/response relationship, doubling the concentration could easily result in toxicity that would not be detected by testing the mean or UCL concentrations.

40. **Comment:** The lack of relationship between chromium, cadmium, and toxicity further indicates that results of the bioassay testing for macroinvertebrates in Pond A were misinterpreted. The actual toxicity observed may be due to the presence of ammonia.

Response: While there was a lack of correlation between chromium, cadmium and toxicity, this could be due to mediating factors influencing toxicity (e.g., the aforementioned TOC or grain size data) or many other factors. The fact that cannot be overlooked in this discussion is that the survival of benthic macroinvertebrates was less than that of Pond A in the control. The BERA does address the suggestion of a correlation between ammonia and the toxicity testing results; the BERA noted that such a correlation is spurious and based on a paucity of data and that the ammonia concentrations were well below those known to cause deleterious effects in these organisms. In short, despite a lack of correlation in the small number of samples tested, comparison with sediment guidelines indicate that the concentrations of cadmium and chromium concentrations in sediment are clearly high enough to cause severe adverse to the organisms tested; ammonia concentrations are not.

41. **Comment:** The derivation of hazard quotients based upon modeling ingestion to selected ecological receptors within the Massapequa Creek and Preserve are overly conservative.

Response: Section 3.0 of the BERA notes that the risks were observed only when the conservative model was used, and that there was no evidence of risk when using more realistic exposure scenarios. More importantly, as described in Section

5.0 of the BERA, the risk management strategy was based primarily on the bioassay testing results of sediments within the ponds.

42. **Comment:** The definitions for no observable adverse effect levels (NOAELs) and lowest observed adverse effect levels (LOAELs) provided on page 3-5, paragraph 4, of the BERA are not accurate.

Response: The definitions for NOAEL and LOAEL given are those taken from the following document (cited but not listed in the References of the BERA): Dourson ML, Stara JF, 1983. Regulatory History and Experimental Support of Uncertainty (Safety) Factors. Regul Toxicol Pharmacol 3:224-238. Regardless of the exact wording of the definitions, the values reported for these levels are values calculated and reported in the Toxicological Benchmarks for Wildlife (Sample at el. 1996 - a.k.a. ORNL 1996).

43. **Comment:** Histological endpoints should not have been used in the assessment.

Response: The explanation of the endpoints used in the NOAEL and LOAEL determinations is described in Section 2.0 of the Toxicological Benchmarks for Wildlife (ORNL 1996), the document from which the values were taken.

44. **Comment:** There is no proof that fish in Pond A are at risk.

Response: The PRPS and the Federal and State Trustees agreed that a literature-based approach could be utilized to assess risk to fish. This approach was selected in lieu of performing additional toxicity testing aimed at measuring effects directly to fish such as chronic toxicity tests of fathead minnows or other surrogates, analysis of fish collected from the ponds for lesions or other histopathological indicators, or similar studies. A comparison to literature data suggests that fish may be at risk on the basis of body burdens. The fact that large fish are present does not preclude the possibility of other adverse impacts to fish.

45. **Comment:** Contamination in Pond A is not unusual for a water body on Long Island. The available bioassays and population data collected during the Supplemental RI (URS, July 2000), Pond A, Massapequa Creek, the reference location, and most of

the Long Island creeks sampled in the 1995 NYSDEC study (referenced in the BERA) should all fall into the same general grouping of slightly to moderately impacted. Therefore, Pond A should not be selected for remediation.

Response: The Supplemental RI results are not sufficient to classify regional stream quality. It is true that the NYSDEC study did conclude that the Massapequa Creek along with the reference area and most of Long Island are slightly to moderately impacted. However, the data collected for the BERA indicate low numbers of organisms, lack of diversity and the absence of any tolerant species; these results indicate that these areas are more than "slightly to moderately impacted."

D. Other

46. **Comment:** Commentors requested that the ROD provide a maximum time period for the PRPs and the EPA to execute an agreement, as well as a time frame for design and construction of the proposed remedies.

Response: The federal law which governs the cleanup of Superfund sites and which provides for the liability of responsible parties is the Comprehensive Environmental Response, Compensation, and Liability Act (the "Superfund law"). This Superfund law is codified among federal statutes at 42 United States Code, starting at Section 9601. The Superfund law provides in section 9622(e) for a 120-day negotiation period between EPA and the PRPs concerning implementation of a remedial action such as the one selected for the Site in the ROD. EPA plans to use the 120-day period provided in the law in order to negotiate a consent decree with the PRPs.

As discussed in response to Comment No. 17 above, EPA expects that the remedy will be implemented by the PRPs, acting pursuant to an enforcement document - either a Consent Decree that would be entered in Federal Court or a unilateral administrative order that would be issued by EPA. In either event, the enforcement document would require the responsible parties to prepare a work plan, subject to EPA approval, for their implementation of the remedy. The work plan would set out specific time periods for the many tasks required to implement the work. These time periods would be enforceable by EPA under the enforcement document.

EPA estimates that the soil and Massapequa Creek remediation components of the remedy would be completed by 2005 and that the construction of the comprehensive groundwater treatment system would be completed by 2006 and that the groundwater treatment system would then operate for perhaps 20 years or more, in order to remediate the groundwater.

47. **Comment:** A commentor asked whether EPA could require the PRPs to escrow the monies needed to implement the remedial design and remedial action (RD/RA) so that the monies would be available for full performance of the RD/RA, notwithstanding the future financial viability of the PRPs. The commentor indicated that this would ensure financial security, among other things, for: a) operation of the treatment system for 30 years or more; and b) compliance with the engineering control requiring maintenance of the "cap" in perpetuity.

Response: As noted in **Response 46** above, following issuance of the Record of Decision, EPA will attempt to have the PRPs implement the remedy preferable through a Consent Decree, alternatively through a UAO. If under the Consent Decree the settling parties failed to live up to their obligations, EPA would be able to go to Federal Court to seek enforcement of the Consent Decree plus penalties for such failure. EPA has developed a "model" Consent Decree that includes a provision requiring settling parties to assure their ability to pay the full amount of the estimated cost of the RD/RA by means of one or more forms of financial security. The forms of financial security might include either a surety bond, letter of credit, trust fund, guarantee of performance, a demonstration that one or more of the settling parties has a net worth significant enough to demonstrate, under EPA regulations, that they would be able to implement the RD/RA. Other suitable forms of financial security, including cash escrows for portions of the work, could be considered during the settlement negotiations. However, as negotiations for the Consent Decree will not commence until after the Record of Decision has been issued, and the choice among the menu of available options may not be selected until the Consent Decree is being implemented, it is too early to predict the form of financial security that will be utilized.

In the event that the PRPs do not enter into a Consent Decree, and a UAO is issued, the UAO will also contain a requirement for the Respondents to post adequate financial security, similar to that which would be required under the Consent Decree.

48. **Comment:** How will the implementation of the remedy be financed?

Response: Please see response to **Comment No.47,** above.

49. **Comment:** Representatives of the South Farmingdale and Massapequa Water Districts commented that the water districts have incurred considerable expense in connection with the groundwater contamination from the Site. The representatives requested that the ROD include the provisions that the water districts be reimbursed for the construction, engineering, legal, and analytical costs incurred to date and the anticipated future annual monitoring costs on sentinel monitoring wells, and that the PRPs be responsible for any future capital, operation and maintenance costs, including well head treatment and well relocation, if any of the district's wellfields are impacted by contamination from the Site.

Response: Should future groundwater data cause the water districts to have reason to believe that contamination from the Site threatens their wells, EPA would evaluate those concerns at such time. Further, the ROD is a record of EPA's decision regarding the selection of the remedial action that should be undertaken at the Site. It does not address questions of financial responsibility for implementing the work. Moreover, EPA does not seek to recover, on behalf of private parties, costs expended by such parties in addressing contamination. Thus, if the water districts believe that they have a claim for reimbursement of costs expended by them in addressing contamination, they would need to make an independent legal evaluation and privately pursue any claims that they believe they may have against any responsible party.

50. **Comment:** At the public availability session on January 9, 2002, one commentor, a real estate broker who works in the Farmingdale area, said that there was a new law in the State of New York that would require disclosure of the Superfund Site and that would negatively affect home prices in Farmingdale. As a result, this commentor supported SL-3 rather than SL-2.

Response: New York State recently enacted the "Real Property Disclosure Act" as Article 14 of the New York Real Property Law, to go into effect on March 1, 2002. This law requires a seller of a residential property to disclose to a potential buyer, certain conditions known to the seller which might affect the residential real property that is being offered for sale. The questions on the disclosure form required by the new New York State law relate to the presence of such environmental hazards at the particular residential property, as well as releases of those materials from the residential property. EPA studies of the Liberty Industrial Superfund Site did not disclose that any hazardous substances from the Liberty Industrial Superfund Site ever migrated onto any residential property.

Proximity to a Superfund site could, as one of many factors, impact the saleability or resale value of a nearby property. EPA has, at other Superfund sites, provided letters to nearby property owners, describing the effect, if any, of the contamination at the Superfund site on the nearby property. At the January 9, 2002 public availability session, EPA offered to do the same for any local Farmingdale resident.

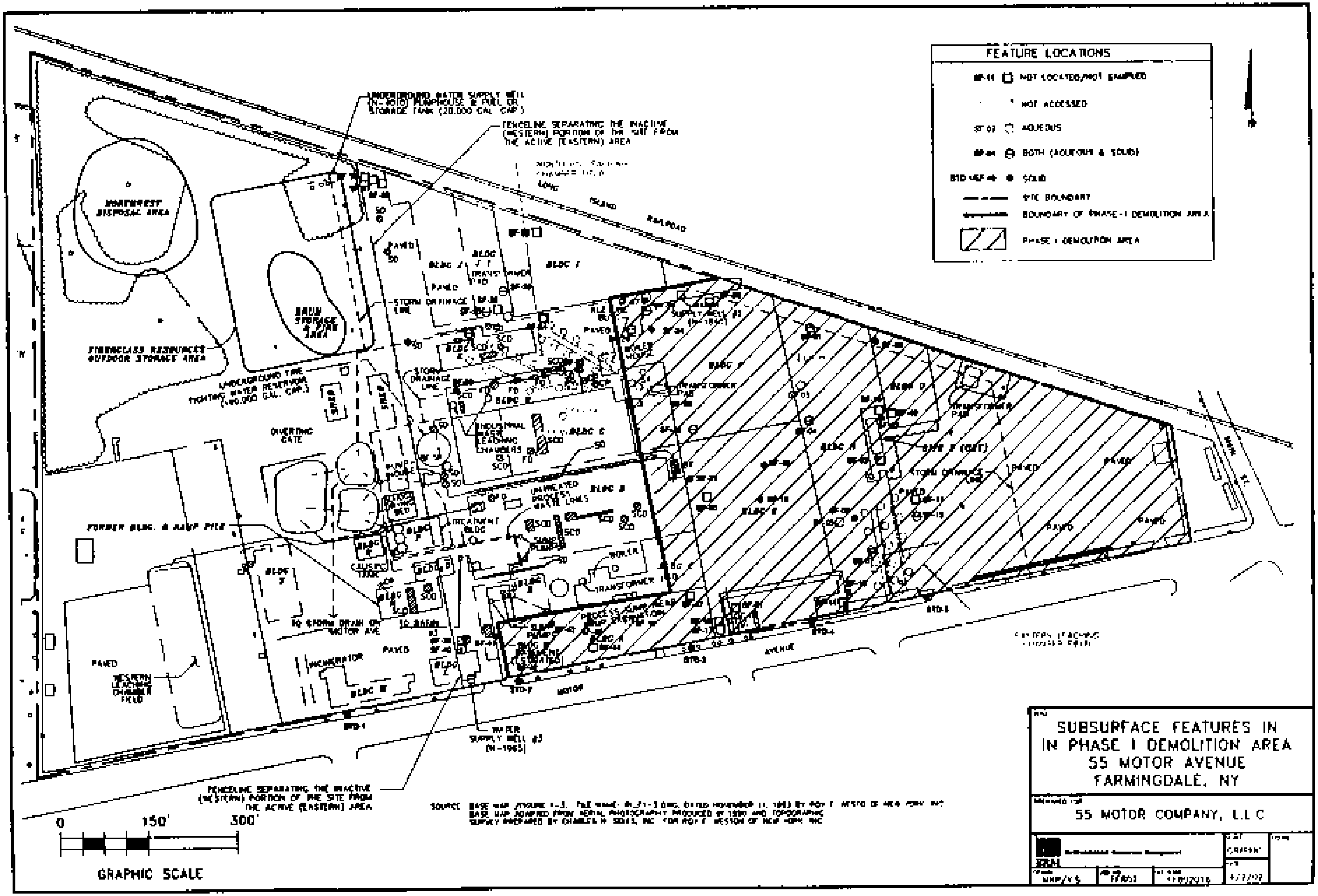


FIGURE RS-1 - PHASE I DEMOLITION AREA

<u>ATTACHMENT 1</u>

<u>TO RESPONSIVENESS SUMMARY</u>

PROPOSED PLAN

Superfund Program
Proposed Plan

LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE FARMINGDALE, TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK

EPA PROPOSES COMPREHENSIVE SITE CLEANUP PLAN

EPA
Region 2

July 2001

MARK YOUR CALENDAR
July 23, 2001 through August 22, 2001: Public comment period on this Proposed Plan.

August 9, 2001 at 7:00 pm: Public meeting at the Farmingdale Library, 116 Merrits Road, Farmingdale, New York

COMMUNITY ROLE IN REMEDY SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting effective remedial actions at Superfund sites. All supporting documentation, including the supplemental remedial investigation and feasibility study (supplemental RI/FS), are being made available to the public for a public comment period which begins on July 23, 2001 and concludes on August 22, 2001.

EPA will hold a public meeting during the comment period at the Farmingdale Library on August 9, 2001 at 7:00 p.m. to allow EPA to present the conclusions of the supplemental RI/FS, to further elaborate on the reasons for recommending the preferred remedy, and to receive public comments.

Written and oral comments received at the public meeting, as well as comments received during the public comment period, will be documented as part of the decision document (called a Record of Decision) which formalizes the selection of the remedial action.

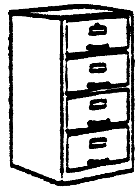
PURPOSE OF THE PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for contaminated soils and the groundwater contaminant plumes at the Liberty Industrial Finishing Superfund site, and identifies the preferred remedial alternatives with the rationale for this preference. The Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). The preferred remedy proposed in this plan would protect human health and the environment from risks associated with the contaminated soils and groundwater attributed to the site.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, including the preferred alternatives. Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) require EPA to solicit public comments on Proposed Plans. The alternatives summarized here are more fully described in the supplemental RI/FS reports and other documents contained in the Administrative Record file for this site.

EPA's preferred remedial alternative to address the on-site contaminated soils would involve a combination of excavation and off-site disposal and capping of site soils contaminated above site-specific groundwater protection levels. EPA's preferred remedial alternative to address the site groundwater contamination includes two components: the on-property groundwater contamination would be addressed through the continued operation of the interim groundwater remedy which would involve below-ground treatment of the contaminated groundwater, the off-property, downgradient groundwater contaminant plumes would also be addressed using the same types of technologies as those proposed for the on-property remedy. EPA's preferred remedial alternative to address the localized contaminated Massapequa Creek pond sediments would be excavation and off-site disposal of contaminated sediments from Pond A. These preferred remedial alternatives are described in greater detail on pages 13 through 16 of this Proposed Plan.

The remedy described in this Proposed Plan is EPA's *preferred* remedy for the contaminated soils and groundwater at the site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments or additional data indicate that such a change will result in a more appropriate remedy. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the remedial alternatives considered in the detailed analysis of the supplemental RI/FS reports because EPA and NYSDEC may select a remedy other than the preferred remedy.



The administrative record file, which contains the information upon which the selection of the remedy will be based, is available at the following locations

Farmingdale Public Library
116 Merritt Road
Farmingdale, New York 11735
Telephone: (516) 249-9090
Contact: Stuart Schaeffer, Librarian
Hours: Monday - Thursday, 9:00 am - 9:00 pm
Friday, 9:00 am - 6:00 pm
Sunday, 1:00 pm - 5:00 pm

United States Environmental Protection Agency
Superfund Records Center
290 Broadway, 18th Floor
New York, NY 10007-1866
By Appointment (212) 637-4308
Hours: Monday - Friday, 9:00 am - 5:00 pm

Written comments on this Proposed Plan should be addressed to:

Lorenzo Thantu
Project Manager
Eastern New York Remediation Section
Emergency and Remedial Response Division
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866

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SITE BACKGROUND

Site Description

The Liberty Industrial Finishing site is located approximately one mile south of Bethpage State Park in the Town of Oyster Bay, Nassau County, New York (see Figure 1). The site includes a 30-acre property known as 55 Motor Avenue. The property is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east and a small county park. Ellsworth Allen Park, to the west. The surrounding area is primarily residential with several commercial establishments on the major roads. Figure 2 depicts former process facilities as well as contaminant source areas at the site.

Currently, approximately half the site property (the western portion, Lot 327) consists of primarily vacant land that abuts the park. The other half of the site (the eastern portion, Lots 328 and 329) contains approximately ten buildings which are leased to a variety of tenants engaged in light industrial activities.

The site is situated on the glacial outwash plain of Long Island. The uppermost aquifer, the Upper Glacial, is estimated to be 85 feet thick beneath the site. The depth to the water table is generally approximately 21 feet below ground surface (bgs), although the site groundwater table fluctuates between 15 and 21 feet bgs. The saturated portion of the Upper Glacial aquifer, with a thickness of 64 feet, begins at the water table and extends down to 85 feet bgs. The Upper Glacial aquifer is underlain by the Magothy aquifer which is approximately 700 feet thick in the vicinity of the site. Groundwater aquifers underlying the site are classified as Class GA pursuant to 6 New York Codes. Rules and Regulations Parts 700-705 (6 NYCRR Parts 700-705, reissued July 1995). The Class GA standards apply to any fresh groundwater which may be a source of potable water supply. Similarly, the groundwater aquifers are classified as Class IIA by EPA in that the aquifers are current or potential sources of drinking water.

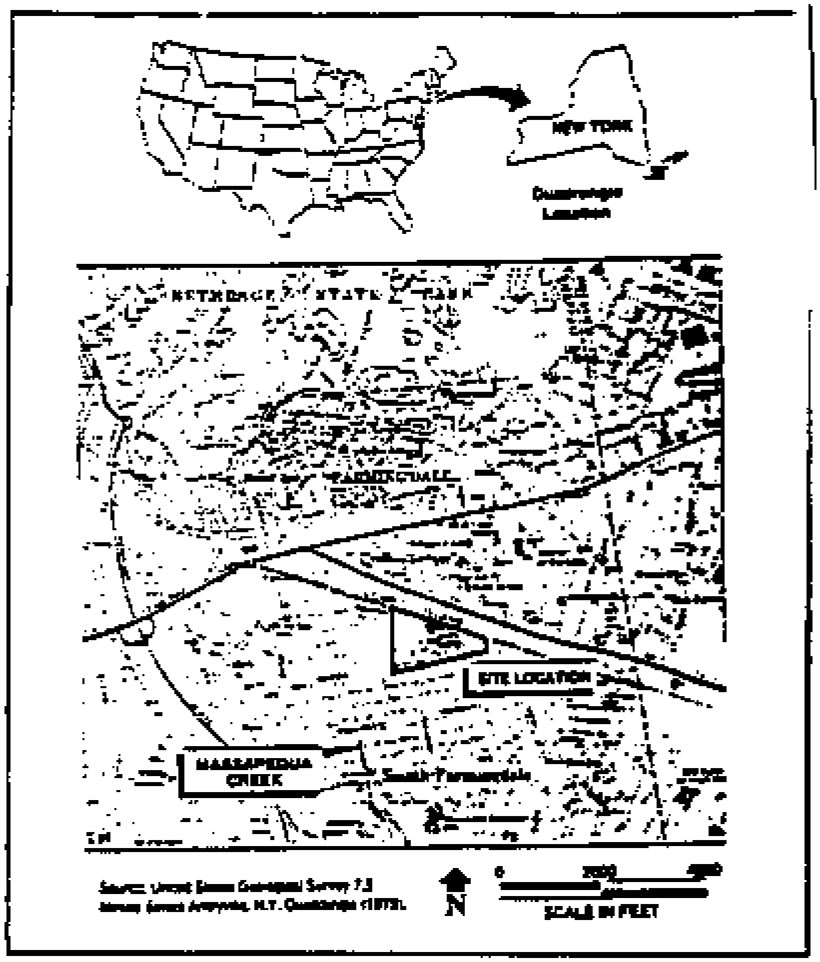

FIGURE 1 - SITE LOCATION MAP

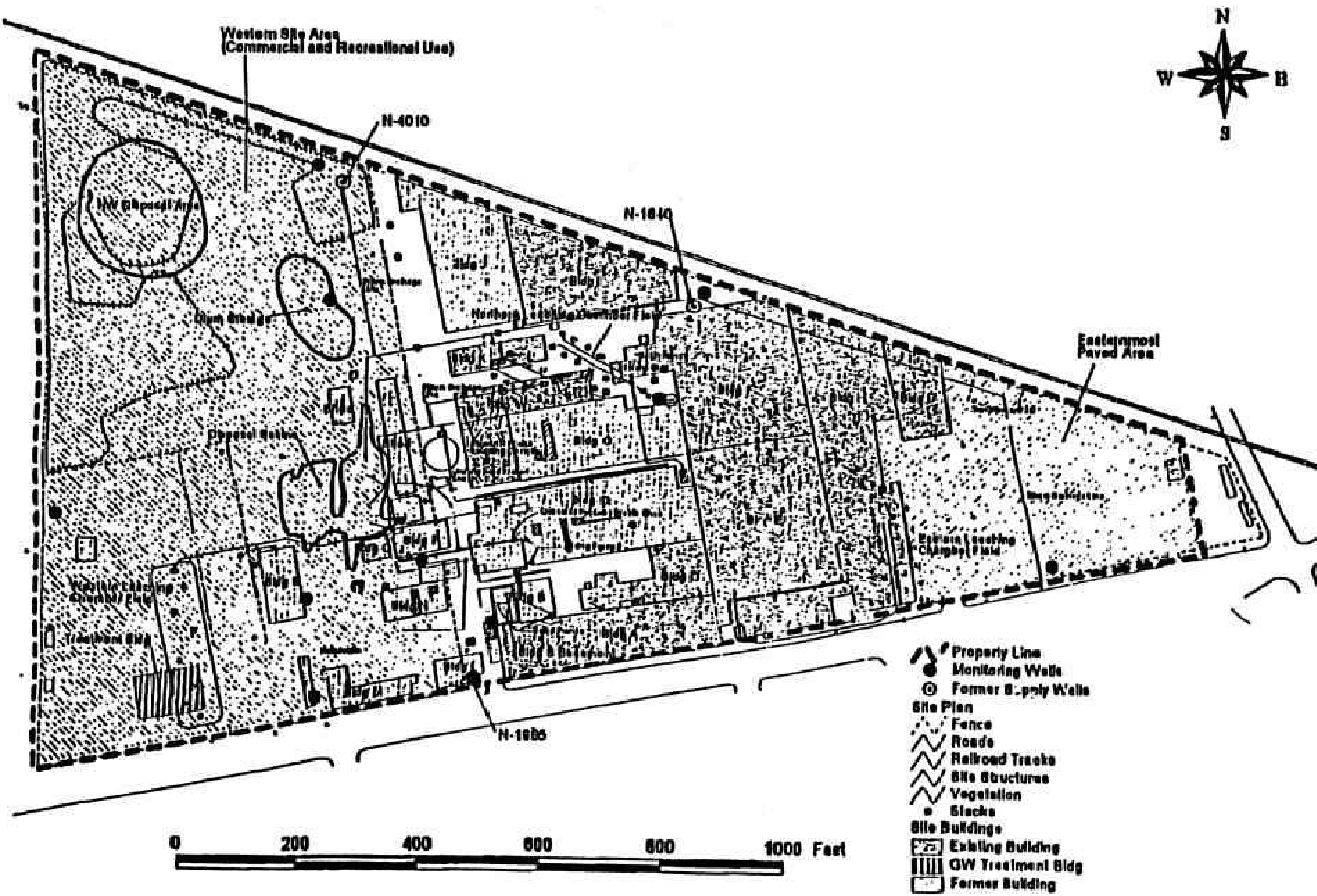

FIGURE 2 - LIBERTY INDUSTRIAL FINISHING SITE PLAN

Site History

The site is a former aircraft parts manufacturing and metal-finishing facility that began its operation in the early 1930's. From 1940 to 1944, the federal government and private corporate interests utilized the site to develop and maintain production of materials needed for World War II. From 1944 through 1957, aircraft-related manufacturing activities predominated at the site. Following 1957, when it was converted into an industrial park, ownership of and operations at the Liberty site changed numerous times. In 1986, the current site owners, or their immediate predecessors, acquired control of the site.

Materials used in site operations included volatile organic compounds (VOCs) such as cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE); inorganic compounds containing cadmium, chromium, and cyanide; as well as other materials such as caustics and acids. Throughout most of the period of industrial operation, wastes containing these materials were discharged untreated into below-grade sumps, underground leaching chambers, and unlined, in-ground wastewater disposal basins.

On June 10, 1986, the Liberty site was placed on the National Priorities List. In 1990, EPA assumed the role of lead agency for the site and initiated an RI/FS to determine the nature and extent of contamination at the site.

EPA conducted a Removal Site Evaluation at the Liberty site during late 1993 and early 1994, and determined that electrical transformer areas contaminated with polychlorinated biphenyls (PCBs), wastes contained in underground storage tanks, and drums located at the site posed an immediate risk to trespassers. At EPA's request, a number of potentially responsible parties (PRPs) agreed to remove these materials and transport them to appropriate facilities for treatment and disposal. All field work for this removal action, which eliminated significant current-use risks associated with the site, was completed by the Fall of 1995.

EPA completed an RI report in January 1994, which included a characterization of contaminated western site soils. EPA then conducted extensive discussions with the community, local officials, and PRPs on future land use so that cleanup options could be evaluated in light of the most reasonably anticipated future land use. A stakeholders group representing these parties was established and met seven times to discuss this issue. A mediator was brought in to facilitate the discussions. However, a consensus about the future land use could not be reached by the community, local officials and the PRPs. EPA ultimately decided that for the purposes of identifying appropriate remedial alternatives, the reasonably anticipated future land use would be commercial/industrial because the site was zoned for industrial use from the 1920's until the mid-1980's and has been used for light industrial activities since that time.

In July 1997, EPA released an FS report and Proposed Plan for the remediation of the contaminated soils on the western portion of the site to the public for comment. A public meeting and a public availability session were held in August 1997 and September 1997, respectively. Many commenters objected to EPA's commerical/industrial land use determination and also expressed concern about the lack of progress in addressing contaminated groundwater. In October 1997, after evaluation of the public comments received on the July 1997 Proposed Plan, EPA announced its decision to postpone the selection of a remedy for the soils on the western portion of the Liberty site to allow time for the Agency to assess further the impact of the soil remedy on the scope and duration of the future groundwater remedy. Additional field work to further characterize site soils, site groundwater and Massapequa Creek was conducted concurrently from 1997 to 1999 by several of PRPs under EPA supervision, so that a comprehensive integrated cleanup could be evaluated for the site.

At the September 1997 public availability session, EPA also announced that it would move forward with an action to prevent the significantly contaminated portion of the groundwater contaminant plume (containing both VOCs and metals) from continuing to migrate from the site until the future long-term comprehensive groundwater remedy was implemented. On March 31, 1998, the EPA Regional Administrator authorized the implementation of an interim groundwater action which has been performed as a non-time-critical removal action under CERCLA. Pilot testing of various innovative technologies for the interim groundwater action (similar to those of EPA's preferred groundwater remedial alternative, discussed herein) began in December 1998 and was completed in May 1999. Construction of the full-scale interim groundwater treatment system began in November 1999. Treatment for VOCs was initiated in January 2000, while treatment for metals was initiated in August 2000.

In 1999 and 2000, additional information became available regarding the future use of the site. On June 10, 1999, the Town of Oyster Bay released a study commissioned by the Town and entitled the Preliminary Assessment of Utilizing the Western Portions of the Liberty Industrial Finishing Site for Parkland (May 7, 1998). Based upon this information, EPA also considered recreational use of the far western portion of the property to be a reasonably anticipated future use. In December 2000, EPA was advised by the Town of Oyster Bay and by the owners of the Liberty site property, that the property owners had made application to the Town of Oyster Bay for a "special use permit" to permit the redevelopment of the easternmost ten acres of the Liberty site. The proposed project includes a supermarket and fueling facility/convenience store, uses that would be consistent with the anticipated commercial/industrial land use for the site.

SUMMARY OF REMEDIAL INVESTIGATIONS

The objective of the supplemental RI and the initial RI was to delineate the nature and extent of contamination at and emanating from the site. During the supplemental RI, an evaluation was also performed which established site-specific cleanup concentrations in soils that would be protective of groundwater quality and would also be protective of human health for the most reasonably anticipated future uses of the site property (commercial/industrial for the eastern portion and commercial/industrial or recreational for the western portion).

The results of the supplemental RI are summarized below by contaminated media, namely, soil, groundwater, and Massapequa Creek sediments; results of the sampling of various subsurface features, underground storage tanks and the County storm drain are also provided.

<u>On-site Soil Contamination</u>

The initial RI and the supplemental RI confirmed several significant on-property source areas including the former Wastewater Disposal Basins, the former Building B Basement area, the former Building B Ramp Pile, and the Northwest Disposal Area (see Figure 2).

Sampling conducted during the initial RI focused on the western site soils. Results indicated that the majority of contaminated soils at the site were contaminated with metals, primarily cadmium and chromium. The sampling results also indicated that certain soils were also contaminated with VOCs. The initial RI sampling did not fully characterize the extent of soil contamination. Therefore, a comprehensive soil sampling program was conducted in the western portion and part of eastern portion of the site as part of the supplemental RI to fully delineate the horizontal and vertical extent of contamination. Using a grid layout approach, 92 soil borings were completed to 20 feet bgs with samples collected at five-foot intervals, beginning with the collection of a surficial sample. Leachability testing was also conducted to derive soil cleanup levels for cadmium and chromium that would be protective of the underlying groundwater aquifers. These levels were established at concentrations of 10 milligrams/kilogram (mg/kg) of cadmium and 143 mg/kg of chromium, which are more restrictive than the health-based levels that EPA typically uses for contact under a residential use exposure scenario. Based on NYSDEC's Technical and Administrative Memorandum (TAGM), the following soil cleanup objectives were adopted for VOC contaminants: 0.7 mg/kg of TCE, 0.25 mg/kg of cis-1,2-DCE, and 1.4 mg/kg of PCE.

Inorganic sampling results indicate that the former Wastewater Disposal Basins, the former Building B Basement area, the Northwest Disposal Area, and the former Building B Ramp Pile represent the major on-property source areas with cadmium and chromium concentrations in excess of their respective soil cleanup levels; outside these source areas, cadmium and chromium were also detected, in scattered locations, in concentrations above their respective soil cleanup levels. Also, analytical sampling results using the Toxicity Characteristic Leaching Procedure (TCLP) established that soils in the Northwest Disposal Area, the former Building B Basement area, and the former Building B Ramp Pile were hazardous wastes as defined by the Resource Conservation and Recovery Act (RCRA).

VOC contamination was detected in a very few soil samples. TCE was detected above soil cleanup objectives in samples collected within the vicinity of the former Building B Basement, with concentrations as high as 5.09 mg/kg. Only two other soil samples (collected from locations immediately south of the former Wastewater Disposal Basins and near the northwest corner of former Building N) had VOC concentrations above soil cleanup objectives with TCE concentrations of 1.17 and 0.78 mg/kg, respectively. Also, it was found that the VOCs are, in general, co-located with soils that also have cadmium and chromium concentrations above their respective soil cleanup levels.

Soil sampling results demonstrate that approximately 95% of the contaminated soils are located on the western portion of the site (e.g., the former Wastewater Disposal Basins, the former Building B Ramp Pile, and the Northwest Disposal Area). Results of the soil gas survey and soil borings indicate that soils on the easternmost 4-acre portion of the site adjacent to Main Street are not contaminated above soil cleanup levels. Also, with the exception of the Northwest Disposal Area, the site property bordering Ellsworth Allen Park does not appear to have been impacted by site-related disposal activities. Consequently, EPA is not proposing to remediate these areas of the site, although these areas will be subject to an institutional control limiting their use to commercial/industrial or recreational, and EPA may later seek a partial delisting of all or part of these areas from the National Priorities List.

<u>Subsurface Features, Underground Storage Tank (UST) and Storm Drain Investigations</u>

As part of the supplemental RI, various subsurface features, underground storage tanks and the County storm drain on Motor Avenue in front of the Liberty Industrial property were investigated.

The subsurface feature investigation and sampling program was undertaken to identify the contents of various sumps, vaults, drains, or other on-site subsurface containment features that are located on the eastern portion of the site and to determine whether any of these features represents continuing sources of groundwater contamination. Sampling results indicated that the features do not represent significant sources of VOC or metals

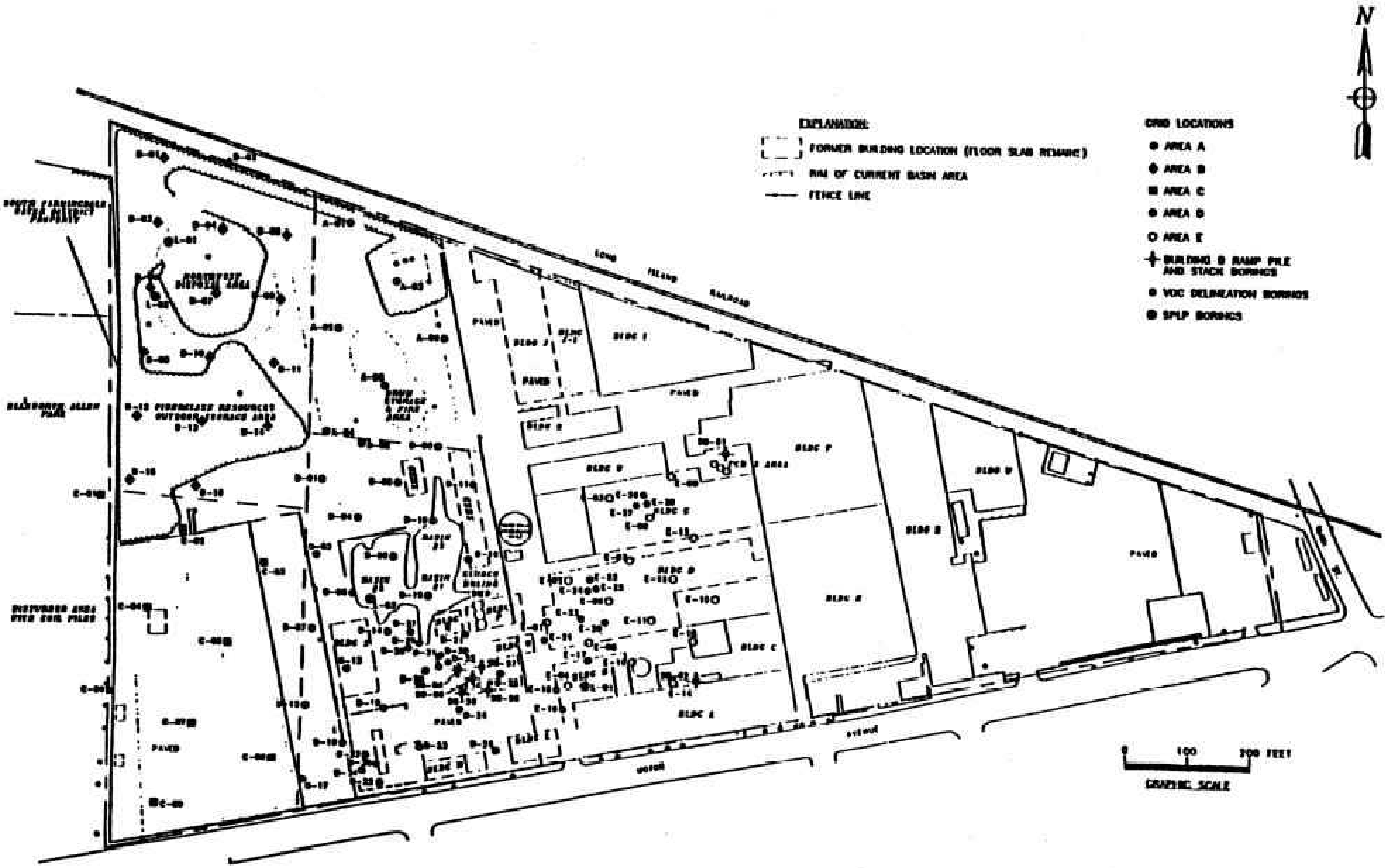

FIGURE 3 - SUPPLEMENTAL SOIL INVESTIGATION LOCATIONS

contamination to groundwater. However, the results did identify two semivolatile organic compounds (SVOCs), namely, benzo[a]pyrene and dibenz[a,h]anthracene, in concentrations as high as 0.041 milligrams/liter (mg/l) and 0.007 mg/l, respectively, in several of the subsurface features. These SVOCs do not present a potential threat to groundwater due to their limited mobility and low concentrations within the concrete subsurface features but would present a risk to future site workers who may come in contact with these substances.

The UST investigation was conducted to evaluate suspected locations of five tanks to determine if the tanks contained hazardous liquids such as waste solvents or PCB-bearing waste oils. Two of the five tanks were not deemed to be of concern. The remaining three tanks could not be accessed due to safety considerations and inaccessibility. Therefore, an investigation of the three tanks will be conducted as part of the comprehensive soil remedy to determine if any remediation is necessary.

Historic plans indicated that the on-site storm drainage system was connected to the County storm sewer system which discharges into the headwaters of Massapequa Creek near Spielman and Roberts Street. To determine if site-related contamination is present within the storm sewer, soil/sludge residuals were sampled by accessing five manholes along the north side of Motor Avenue. Site-related VOCs were not detected in any of the five samples and cadmium and chromium were detected at concentrations below their respective soil cleanup levels.

<u>Groundwater Contamination</u>

An extensive groundwater investigation was conducted to evaluate the nature and extent of contamination in both the Upper Glacial aquifer and the Magothy aquifer. There are currently 16 on-property monitoring wells completed in the Upper Glacial aquifer and 2 on-property monitoring wells completed in the Magothy aquifer. In addition, there are currently 26 off-property monitoring wells completed in the Upper Glacial aquifer and 20 off-property monitoring wells completed in the Magothy aquifer.

Sampling results indicate that two distinct plumes exist beneath the property. These plumes have been designated as Plume A and Plume B. Plume A originates on the western portion of the Liberty property, while Plume B apparently originates primarily upgradient of the site, east of Plume A. Plume A is characterized by TCE concentrations (including degradation products such as cis-1,2-DCE) coming mainly from the former Building B Basement area and the former Wastewater Disposal Basins and extending south-southwest (generally west of Woodward Parkway). There is no significant PCE concentration in Plume A. Plume A is also characterized by chromium and cadmium contamination. Plume B is characterized by PCE concentrations (including degradation products) and extends across the site toward the south-southwest (generally east of Woodward Parkway). PCE contamination was highest approximately 300 feet north of the Liberty property with a concentration of 1,100 micrograms/liter (µg/l) which indicates that the primary source of Plume B contamination is upgradient of the Liberty property. Unlike Plume A, Plume B is not characterized by chromium and cadmium contamination. Both Plumes A and B were delineated as relatively narrow in shape, which is typical of plumes in sandy aquifers similar to the Upper Glacial aquifer. The on-property and off-property extent of contamination in Plume A has been delineated while further investigation of Plume B and its source(s) is being conducted by EPA.

In Plume A, the cadmium and chromium contamination exists throughout the Upper Glacial aquifer under the Liberty property (maximum detected concentrations of 262 µg/l cadmium and 156 µg/l chromium) and to a lesser extent in the upper portion of the Magothy aquifer (maximum detected concentration of 10 µg/l chromium - cadmium was not detected). The Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for cadmium and chromium are 5 µg/l and 50 µg/l, respectively. Inorganic contamination in the off-property groundwater is almost entirely limited to the Upper Glacial aquifer (maximum detected concentrations of 135 µg/l of cadmium and 553 µg/l of chromium). The inorganic contaminant plume appears to extend approximately a mile beyond the site property just to the north of the Southern State Parkway.

Plume A sampling data for groundwater beneath the Liberty property indicated that VOC contamination is limited to the upper portion of the Upper Glacial aquifer (maximum detected concentrations of 1,500 µg/l of TCE, 810 µg/l of cis-1,2-DCE, and 2 µg/l of PCE); the MCLs for TCE, cis-1,2-DCE and PCE are 5 µg/l, 70 µg/l and 5 µg/l, respectively. VOC sampling data for off-property groundwater revealed that site-related VOC contamination is present throughout the Upper Glacial aquifer (maximum detected concentrations of 160 µg/l of TCE, 48 µg/l of cis-1,2-DCE, and 7 µg/l of PCE) and into the upper portion of the Magothy aquifer (maximum detected concentrations of 490 µg/l of TCE, 24 µg/l of cis-1,2-DCE, and 3 µg/l of PCE). The VOC contaminant plume within the Upper Glacial aquifer also appears to extend approximately a mile beyond the site property just to the north of the Southern State Parkway.

The depth to the water table is approximately 21 feet bgs, although the site groundwater table fluctuates between 15 feet bgs and 21 feet bgs. Based on six rounds of groundwater elevations (or depth-to-groundwater table measurements), groundwater flow within the Upper Glacial aquifer was determined to be predominantly horizontal and in the south-southwesterly direction; the horizontal flow velocity in the Upper Glacial aquifer was estimated to be about 1.6 feet/day. The direction of the horizontal component of groundwater flow within the Magothy aquifer is also in the south-southwesterly direction, with a slight south-southeasterly component north of the Farmingdale

High School; the horizontal flow velocity in the Magothy aquifer was estimated to be about 0.17 feet/day.

Through a collaborative effort with the Massapequa and South Farmingdale Water Districts, six sentinel monitoring wells were installed upgradient of the water districts' drinking water supply well fields to serve as an early warning system should contamination migrate close to the well fields. The water districts' periodic monitoring of these sentinel wells has not detected any site-related contamination.

Massapequa Creek

The initial RI revealed that the Liberty groundwater contaminant plume within the Upper Glacial aquifer discharges into Massapequa Creek north of Pond A. The County storm sewer system, to which the on-site storm drainage system is connected, also discharges into the headwaters of Massapequa Creek. The six ponds (Ponds A, 1, 2, 3, 4, and 5, from upstream to downstream) located along the Massapequa Creek corridor are about 1 to 4 feet deep and were constructed to control localized flooding and silting of the streambed. The conceptual model of site contamination based upon the RI indicates that these ponds serve as detention basins for runoff and associated sediments entering the creek from the watershed. Pond A, being located furthest upstream and closest to the Liberty Site, therefore has the greatest potential to be affected by contaminated groundwater discharge from the Liberty Site. This information indicated the need to expand the limited investigation of the Massapequa Creek that was initially conducted during the RI.

The objective of the supplemental RI was to further define the extent of groundwater discharge, and to evaluate potential ecological effects in an ecological risk assessment. The supplemental RI included the following activities: surface water sampling, stream and pond sediment sampling, sediment toxicity (bioassay) testing, fish sampling, and benthic macroinvertebrate surveys. Figure 4 shows the ecological sampling locations in the Massapequa Creek and ponds that were investigated. Mill Pond, located in Bellmore approximately four miles west of the Massapequa Preserve, was utilized as a reference pond with which to compare results of the supplemental RI.

Analytical results from the supplemental RI were screened in order to determine potential ecological risks from groundwater requiring further evaluation in the risk assessment. Exceeding screening benchmarks does not necessarily indicate the need for cleanup, or even the presence of actual risks, but indicate the need for further site-specific evaluation of potential ecological risks in order to form the basis of informed risk management decisions. Results of the supplemental RI indicated that several chemicals present in groundwater discharging from the site were also present in surface water and sediment at levels exceeding ecologically-based screening benchmarks. The highest frequency and magnitude of these values were noted in Pond A.

Water samples were collected from 13 locations within the Massapequa Creek system and analyzed for VOCs and cadmium, chromium and lead. The samples were collected between the eastern branch headwaters of Massapequa Creek and just south of Pond 2. Results indicated only trace concentrations of VOCs in the surface water samples, none above the NYSDEC chronic ambient water quality standards (AWQS). Cadmium was detected above the NYSDEC chronic AWQS between Pond A and Pond 1 and above the NYSDEC acute AWQS upstream of Pond A; cadmium concentrations to the south of Pond 1 were either nondectable or below the AWQS. Total chromium concentrations were below the NYSDEC AWQS throughout the study area. These results are compatible with overall characteristics of shallow groundwater discharge into the Massapequa Creek

Five rounds of stream sediment and pond sediment sampling were conducted, though not all locations were sampled in each round. Metal concentrations in stream sediments were lower (by about two orders of magnitude) than the metals concentrations in pond sediments. The metals data were compared to NYSDEC guidance values used to screen contaminated sediments for possible adverse ecological impacts. Cadmium concentrations which exceeded the NYSDEC Severe Effect Level (SEL) sediment screening guideline (9 mg/kg) in all ponds except the reference pond (Mill Pond), were highest in Pond A and Pond 1. Chromium concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; chromium concentrations were highest in Pond A, Pond 1, and Pond 4.

As the NYSDEC SELs are generic guidance criteria, they suggest the possibility for adverse ecological impacts. In such situations, site-specific information (e.g., sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses) is usually relied upon to provide additional information regarding the potential for ecological effects to result from exposure to contamination present in the system. These tests and their results are described under "Ecological Risk Assessment" below.

SUMMARY OF SITE RISKS

Human Health Risk Assessment Update (HHRA) and Ecological Risk Assessment Update (ERA) were prepared based upon the results of the supplemental RI to estimate the risks associated with current and future site conditions. These baseline risk assessments estimate the human health and ecological risks which could result from

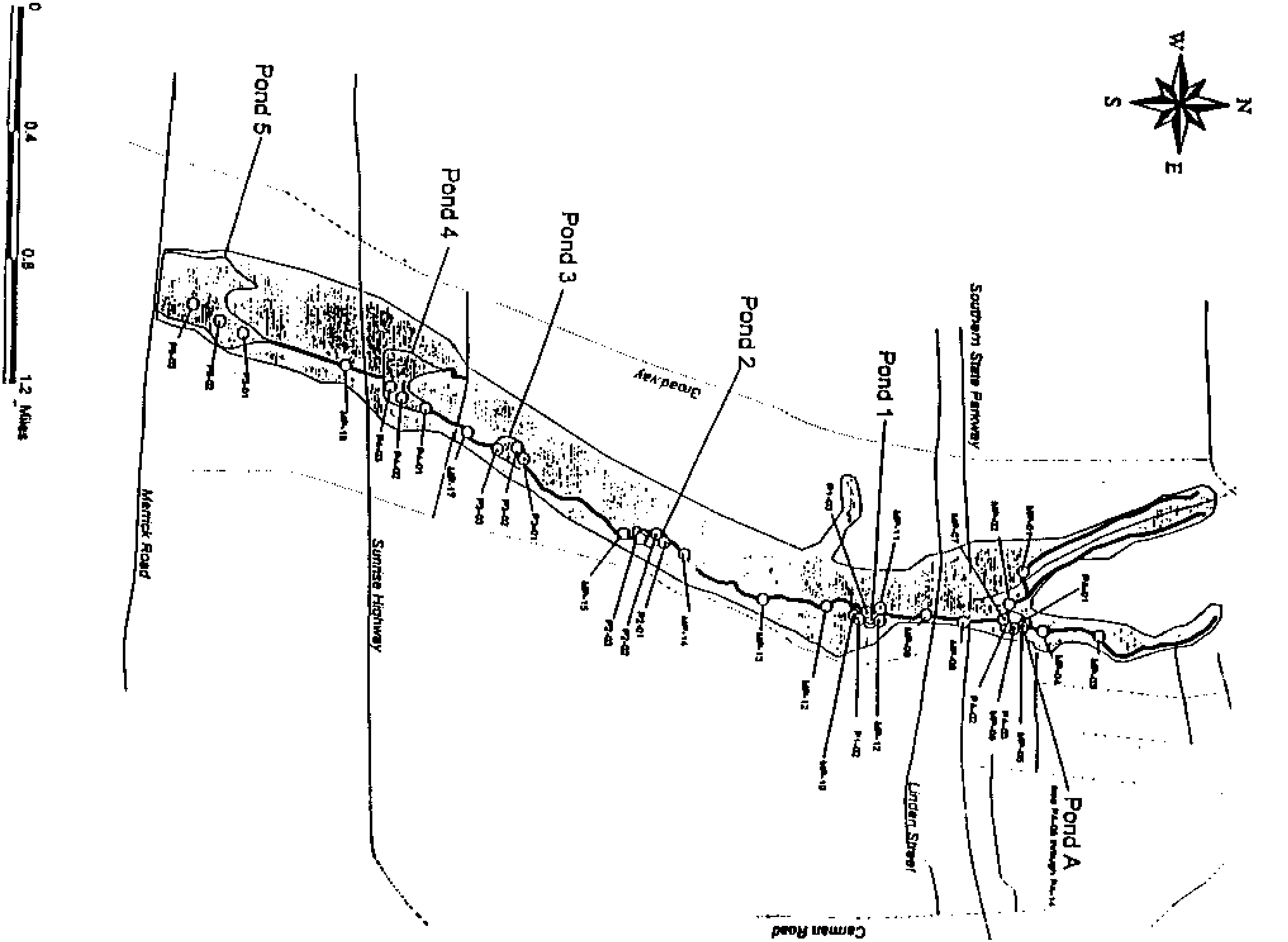

FIGURE 4 - MASSAPEQUA CREEK AND POND SAMPLE LOCATIONS

exposure to the contamination at the site, if no remedial action were taken.

Human Health Risk Assessment

Four potential exposure areas were considered in the HHRA: western portion of the site, eastern portion of the site, off-property residential areas (including Ellsworth Allen Park and Woodward Parkway School), and the Massapequa Preserve. Quantitative risk characterization as conducted in the HHRA is summarized below for the four potential exposure areas.

For the western portion, none of the cancer risks estimated exceed EPA's target risk range. The only scenario in which a noncarcinogenic hazard exceeds EPA's benchmark value of an HI of 1, based on concentrations of cadmium and chromium in the groundwater, would be for a hypothetical site worker who would be exposed to contaminants in the Upper Glacial groundwater in the future. For this scenario, an HI of 8.9 was calculated. This exposure currently does not occur, since groundwater is not used as a drinking water source at the site.

For the eastern portion, the only potential receptor whose cumulative risk would exceed one-in-a-million excess cancer risk is a future construction worker. The primary exposure route driving this risk would be dermal contact with SVOCs, benzo[a]pyrene and dibenz[a,h]anthracene, which were found in the aqueous waste in some of the subsurface features, but are not prevalent in the soils at the site. The cancer risk associated with this scenario is 1×10^{-3}, which is greater than the upper boundary of the acceptable cancer risk range. The only potential receptor whose HI would exceed EPA's benchmark of 1.0, based on chromium and PCB (Aroclor 1260) contamination, is also a future construction worker (HI of 32.5) from dermal exposure to aqueous waste.

For the off-property residential areas, the potential receptors whose cumulative cancer risks would exceed EPA's target cancer risk are current and future off-property residents. Local residents' hypothetical cancer risk from exposure to the Upper Glacial groundwater is 1.9×10^{-3}, which is driven by vinyl chloride (a degradation product of TCE). The evaluation of hypothetical noncarcinogenic hazards are calculated at a HI of 95 to off-site children and 26 to off-site adults; both noncarcinogenic hazards are driven by cadmium, chromium, and manganese. Local residents' hypothetical cancer risk from exposure to the Magothy groundwater is 4.9×10^{-4}, which is driven by vinyl chloride and 1,1-DCE (two degradation products of TCE). The evaluation of hypothetical noncarcinogenic hazards are calculated at an HI of 6.8 to children, with chromium and manganese as the risk drivers. It is noted, however, that these scenarios are hypothetical as the groundwater in the vicinity of the site is not used for public drinking water supply.

For the Massapequa Preserve, all carcinogenic risk estimated for exposure to site-related contamination in surface water and sediment were within EPA's acceptable risk range. Noncarcinogenic HI values for these exposure pathways, and the pathway for the ingestion of fish contaminated with cadmium, chromium and lead by children and adults are about 1 or less.

Ecological Risk Assessment

A four-step process is utilized for assessing site-related ecological risks for a reasonable maximum exposure scenario: Problem Formulation–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; and Risk Characterization – measurement or estimation of both current and future adverse effects.

The objectives of the ERA, which was conducted as part of the supplemental RI, were to identify and estimate the potential ecological impacts associated with the exposure of fish and wildlife to site-related contamination within the Massapequa Preserve. Specifically, the ERA focused on the potential impacts of the contaminants of concern (COPCs) found in sediments and surface waters of the Massapequa Preserve, downstream of the zone of influence of a groundwater plume that originates at the site, to terrestrial and aquatic ecological receptors.

Surface water and sediment of the Massapequa Preserve were analyzed for both inorganic and organic chemicals, and fish tissues were analyzed for cadmium, chromium, and lead. The COPCs were identified by comparing contaminant concentrations in surface water and sediment with the ecologically-based screening benchmarks. Detection of cadmium, chromium, and lead (which is believed to have been introduced into the Massapequa Creek via urban runoff) in most of the Massapequa Creek Pond sediment samples at concentrations above their respective NYSDEC SELs suggested the possibility of adverse effects. Therefore, sediment toxicity testing (bioassays) and fish tissue analyses were conducted to further assess the potential effects.

Sediment toxicity testing was performed to evaluate whether the metals concentrations in sediments have any effect on the survival of acclimated test organisms. These tests are bioassays conducted in a laboratory where certain organisms are exposed to contaminated sediment samples and monitored. Two rounds of sediment toxicity tests were conducted; the first round was conducted on sediments from all six Massapequa Creek ponds and the second round was conducted on sediments from only Pond A where the highest cadmium, chromium, and lead concentrations of 248 mg/kg, 839 mg/kg, and 1,160 mg/kg, respectively, were detected. The sediment toxicity tests were conducted on two standard benthic invertebrate test organisms (Hyalella azteca and Chironomus tentans) by exposing them to site sediments. The bioassay results indicted toxicity to the test organisms from exposure to the sediment samples from Pond A. Pond sediments with cadmium concentrations of at least 99.9 ppm and chromium concentrations of at least 457 ppm caused a significant reduction in survival of H. azteca and a significant reduction in growth of C. tentans compared to the control sediments.

Fish tissue sampling was performed to determine metals concentrations in fish tissue for use in the human and ecological risk assessments. Fish samples were collected from five pond locations in Massapequa Preserve (Pond A and Pond 2 through Pond 5) and from the reference location. Both carcass and fillet analyses were performed for lead, chromium, and cadmium.

Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk in Pond A. The highest body burdens of chromium and lead were reported in fish collected from Pond A. Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk from the contaminated sediments in Pond A. The highest concentrations of cadmium were found in fish from Pond A and Pond 5. The highest concentrations of chromium and lead were found in fish from Pond A. In Pond A, the whole fish sample for carp contained lead, chromium, and cadmium at 4.76 mg/kg 2.82 mg/kg, and 0.83 mg/kg, respectively.

The objective of the benthic macroinvertebrate survey was to evaluate the abundance and diversity of the macroinvertebrate community in the ponds along Massapequa Creek. The composition of this community can be a useful indicator for the degree of overall impacts to the ecological habitat. Twelve sediment samples for macroinvertebrate analyses were collected from ponds along Massapequa Creek. Results from the macroinvertebrate study indicate that the benthic macroinvertebrate populations at all locations, including the reference location, were impoverished, of low diversity, and consisted largely of bloodworms, a few midges, and leaches. This is attributed to the introduction of contaminants into the locations from urban runoffs. Pond A was found to have the lowest diversity and the least evenness. However, the Mill Pond reference location also had very low number of total specimens, richness, diversity and evenness.

Based on the weight-of-evidence from the cumulative Massapequa Creek investigatory results as described

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 bioaccumlation. The most frequently selected contaminants of concern for the Liberty site include arsenic, cadmium, chromium, lead, PCE, and TCE.

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 noncancer 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 noncancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure 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 noncancer 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 noncancer 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 noncancer HI is that a “threshold level” (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

above, it was concluded that Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish.

Based on the supplemental RI and the conclusions of the HHRA and the ERA, EPA has determined that actual or threatened releases of hazardous substances from the site, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to public health, welfare and 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 and risk-based levels established in the risk assessment.

The following remedial action objectives have been established for the site:

- prevent the direct exposure of receptors to site-related contaminants or mitigate soil contaminant concentrations to a level that will not pose unacceptable risks to human health and the environment,
- reduce the concentration or mobility of soil contaminants to a level which will prevent further degradation of groundwater,
- restore groundwater quality to drinking water standards,
- prevent adverse effects to ecological receptors within the Massapequa Creek and associated ponds caused by exposure to site-related contaminants, and
- remove any hazardous waste from the site.

Based on the information provided in the supplemental RI report and the HHRA, soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium were developed for the site. The NYSDEC's soil cleanup objectives, as specified in the TAGM, were adopted as the soil cleanup levels for TCE, cis-1,2-DCE, and PCE, respectively: 0.7 mg/kg, 0.25 mg/kg, and 1.4 mg/kg. These soil cleanup levels represent allowable concentrations in soils that would be protective of human health under future commercial/industrial or recreational uses of the site. These soil cleanup levels would also maintain the drinking-water quality of the underlying groundwater aquifers.

Existing data indicate that the eastern four acres of the site meet the remedial action objectives for soil and groundwater and, therefore, no remedial action is necessary for these four acres. Similarly, with the exception of land included in the Northwest Disposal Area the site property bordering Ellsworth Allen Park does not appear to have been impacted by site-related disposal activities and does not warrant remediation.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected site remedy be protective of human health and the environment, be cost-effective, comply with federal and state requirements that are applicable or relevant and appropriate to the site, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives 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 the hazardous substances.

Based on the information contained in the RI and FS reports, this Proposed Plan evaluates, in detail, three remedial alternatives for site soil contamination, three remedial alternatives for groundwater contamination, and two remedial alternatives for sediment contamination within Pond A. The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with the PRPs, design the remedial action or procure contracts for design and construction. In addition, the alternatives discussed below may vary in title and description from those identified in the FS report.

The alternatives are:

Soil Remedial Alternatives

The cleanup levels for site soils presented under the discussion entitled, "Remedial Action Objectives," above on this page, would require remediation of approximately 73,100 cubic yards of soil. The bulk of the contamination is located in four discrete areas: the Former Wastewater Disposal Basins (11,400 cubic yards), the Northwest Disposal Area (32,000 cubic yards), the Building B Basement (3,470 cubic yards), and the former Building B Ramp Pile (530 cubic yards).

Of particular concern at the Liberty site is contamination in the subsurface soil that may come in contact with the groundwater. Unlike conditions at other sites where subsurface contamination is subject to leaching primarily from infiltrating precipitation, at the Liberty site, there exists a significant volume of contaminated soils that are in contact with the groundwater, as the groundwater table can fluctuate from 15 to 21 feet bgs. In addition to the three alternatives described below, two other alternatives were preliminarily considered but not carried through the detailed comparative analysis in this Proposed Plan.

One alternative involving the contaminated soils at depth of 15 to 21 feet included excavating the contaminated soils and replacing this material with clean fill, redepositing the excavated soils above the clean fill and installing a cap. This alternative was eliminated from the detailed consideration because it would not comply with New York Environmental Conservation Law §27-0704 (Long Island Landfill Law) which is an applicable or relevant and appropriate requirement (ARAR) for the site. This law prohibits the creation of new landfills on Long Island in an effort to protect the sole source aquifer which is the primary source of drinking water for Long Island residents.

Another alternative involved excavation and stabilization of contaminated soils and redeposition of the stabilized material on the site property. This alternative was also eliminated from detailed consideration because it also would not comply with the Long Island Landfill Law. In addition, this alternative would require time to perform treatability studies, remedial design and the actual treatment of inorganically- and organically-contaminated soils; it would be technically difficult to stabilize some soils given the nature of the highest levels of contamination found at the site; and it would likely not be widely accepted by the public.

Alternative SL-1: No Action

Capital Cost:	N/A
Total Operation and Maintenance Cost:	N/A
Present Worth Cost:	N/A
Construction Time:	N/A

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the soil contamination at the site.

Because this alternative would result in contaminants remaining on site, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative SL-2: Excavation and Off-site Disposal of Contaminated Soils Near the Water Table and Capping of Other Contaminated Soils

Capital Cost:	$ 8,940,000
Total Operation and Maintenance Cost:	$ 344,000
Present Worth Cost*:	$ 9,283,000
Construction Time:	2 years

* The present worth costs are calculated using a discount rate of 8 percent and a 20-year time interval.

Alternative SL-2 would involve the excavation and off-site disposal of approximately 25,600 cubic yards of contaminated soils at depths of approximately 15 to 21 feet bgs and corresponding overlying soils (above 15 feet bgs that exceed cadmium and chromium cleanup levels, as well as other site soils, which would be characterized as RCRA hazardous waste. The excavation, which would need to be conducted when the water table is low, would occur primarily in the area of the Former Wastewater Disposal Basins. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Soils that were not contaminated above site-specific cleanup levels would be left at the site. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the site to the original grade. For cost-estimating purposes, it is assumed that 16,000 cubic yards of the excavated soils would be sent to a RCRA Subtitle C facility.

This alternative would also include capping the remaining areas of the site (approximately 9 acres in total) where concentrations exceed cadmium and chromium cleanup levels. The cap would be either an asphalt cover system or engineered structure, such as a building. If asphalt were used, it would be designed and constructed to include a 5-inch thick bituminous stabilized base overlain by a geotextile fabric and a 2-inch bituminous concrete with a permeability on the order of 5 x 10-8 cm/sec. The geotextile fabric would prevent surface cracks from spreading, reduce the potential for infiltration through cracks that may occur between maintenance activities, and further reduce the overall permeability of the asphalt cover system. Because the cap is susceptible to weathering and cracking, a maintenance and inspection program would be required to ensure the long-term integrity of the cap.

In addition, contaminated USTs and other subsurface features would be remediated through the removal of the aqueous and/or solid materials from the USTs and the subsurface features, via application of readily available technologies (such as liquid and sludge removal by vacuum suction).

This alternative would leave contaminants at the site and would not allow for unrestricted land use. Therefore, institutional controls (e.g., deed restrictions to prevent any use of the site other than those future recreational (western portion only) or those commercial/industrial uses that would be permitted), and a requirement to maintain the integrity of the cap would need to be implemented. In addition, because this alternative would result in soil contamination remaining at the site, CERCLA would require that the site be reviewed at least once every five years to ensure that it remains protective of human health and the environment.

Alternative SL-3: Excavation and Off-site Disposal of All Contaminated Soils

Capital Cost:	$ 15,081,000
Total Operation and Maintenance Cost:	$ 196,000
Present Worth Cost:	$ 15,277,000
Construction Time:	2 - 3 years

Alternative SL-3 would involve excavation and off-site disposal of approximately 73,130 cubic yards of contaminated soils that exceed cadmium and chromium cleanup levels. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the site to the original grade. The USTs/subsurface features investigation and remediation provisions described under Alternative SL-2 would also pertain to Alternative SL-3.

Under this alternative, CERCLA's five-year review would also be required to ensure that the remedial action remains protective of human health and the environment.

__Groundwater Remedial Alternatives__

As noted above, the interim groundwater remedy selected in March 1998 called for the treatment of the contaminated groundwater leaving the Liberty property. However, during the design of the interim groundwater remedy, it was learned that the principal source for Plume B is apparently upgradient of the property, and EPA decided that it was necessary to further evaluate this plume. EPA recently completed the fieldwork for this effort. Because it has been shown that effective treatment of Plume A will involve treating Plume B, EPA has determined that Plume B should be addressed as part of any Liberty comprehensive groundwater remedial action. And, based on the decision selecting the interim groundwater remedy, EPA has also determined that the portion of Plume B underlying the site property should be addressed via the same innovative technologies called for in the interim remedy. A comprehensive groundwater remedy for the Liberty site would thus address contamination from both plumes. EPA is attempting to identify the location of the source of the Plume B contamination and will evaluate options for remediating the source once identified.

The contaminated groundwater at the site will be remediated to federal and New York State drinking water and groundwater standards.

Alternative GW-1: No Action

Capital Cost:	$ 183,000
Total Operation and Maintenance Cost:	$ 1,080,000
Present Worth Cost:	$ 1,263,000
Construction Time:	Immediately

The Superfund program requires that the "no action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the off-property groundwater contamination. However, this alternative does include the implementation of a groundwater monitoring program, which would include installation of eight shallow and eight deep monitoring wells. Quarterly sampling, analyses, and water level measurements from new as well as selected existing on-site and off-site monitoring wells would be performed to assess contaminant migration and the long-term effectiveness of this no-action alternative. Under this alternative, the interim groundwater action would cease operation after the three-year period (September 2003) authorized under the non-time critical removal action.

Because this alternative would result in contaminants remaining in the groundwater plume above drinking water standards, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the groundwater contamination.

Alternative GW 2: In-Well Groundwater Treatment with Continuation of the On-property Interim Groundwater Action

Capital Cost*:	$ 5,479,000
Total Operation and Maintenance Cost*:	$ 9,631,000
Present Worth Cost*:	$15,110,000
Construction Time:	1 ½ years

* Includes the following costs for Plume B treatment system: capital cost of $1,273,000, total 20-year operation and maintenance cost of $1,404,000, and present worth cost of $2,677,000.

Alternative GW-2 would involve the use of two innovative technologies to remove VOCs and metal contaminants in the groundwater below ground. The first treatment component would involve in-well vapor stripping which is also known as groundwater circulation well (GCW) technology. In such a system, air is pumped into a well causing groundwater in the vicinity of the well to circulate around and through the well, while at the same time causing volatile contaminants to volatilize or be bubbled out of the groundwater. The volatile contaminants would be captured by an above-ground vapor-phase granular activated carbon unit.

As air stripping is not an effective means of removing metals, removal of soluble metal contaminants would be accomplished through a second treatment component which would incorporate a chelating medium which is an organic medium that captures metals. Once the metal contaminants have been removed, the clean groundwater would be pumped back into the aquifers. The chelating materials would be periodically regenerated to remove the captured metals; the resulting metals-contaminated waste would be disposed of at an off-site EPA-approved hazardous waste facility.

Because the off-property component of the plume in the Magothy aquifer is limited to VOCs, it would only require a GCW system for VOC removal; the off-property component of the plume in the Upper Glacial aquifer would require a GCW system coupled with a metals-removal technology component. The optimal location for the off-property GCW treatment system would be between Woodward Parkway and the headwaters of the Massapequa Creek (i.e., east of Woodward Parkway Elementary School near where the elevated site-related VOC concentrations have been detected). Three GCWs with a metals-removal technology component would be installed approximately 60 feet deep in the Upper Glacial aquifer and three GCWs without a metals-removal technology component would be installed approximately 180 feet deep in the Magothy aquifer. The total circulation rate of these six GCWs would be approximately 375 gallons per minute (gpm).

Because the hydrogeochemical characteristics of the Magothy aquifer are distinct from those of the Upper Glacial aquifer, pilot testing of the GCW treatment component, discussed above, would need to be conducted as part of the design effort to evaluate its effectiveness and feasibility in the Magothy aquifer.

Alternative GW-2 would also involve the continuation of the interim groundwater action with respect to the significantly-contaminated portion of the groundwater plume beneath the site property within the Upper Glacial aquifer. The interim groundwater action employs innovative technologies identical to those described above. A total of three GCW systems have been installed approximately 90 feet deep into the bottom of the Upper Glacial aquifer, downgradient of the Former Wastewater Disposal Basins on the site property and parallel to Motor Avenue. The three GCW systems are designed to handle a combined, average flow of 210 gpm. Plume B would also be addressed by installation and long-term operation of five GCW systems in the north-central portion of the Liberty property, within the Upper Glacial aquifer perpendicular to the direction of groundwater flow, to treat VOCs. The configuration of the Plume B treatment system as well as the cost estimates would be further refined upon EPA's review of the recently completed field investigation.

Alternative GW-2 would also include an enhanced monitoring program to document and monitor the leading edge of the off-property groundwater contaminant plume where concentrations are near nondetectable levels or drinking water standards and, therefore, would render the application of any active groundwater remedial alternative economically infeasible. Under this alternative, a site-specific groundwater fate and transport model would also be performed to assess the effectiveness of natural attenuation in the leading edge of the plume in conjunction with groundwater remediation.

In addition, institutional controls (e.g., deed restrictions to prohibit installation or use of groundwater wells for human consumption purposes) would need to be implemented.

Alternative GW-3: Groundwater Extraction and Treatment with Continuation of Interim Groundwater Action

Capital Cost*:	$ 5,829,000
Total Operation and Maintenance Cost*:	$ 11,458,000
Present Worth Cost*:	$ 17,287,000
Construction Time:	2 years

* Includes the same costs for Plume B treatment as in Alternative GW-2.

Alternative GW-3 would consist of a conventional groundwater pumping and treatment system. The off-property contaminated groundwater would be extracted from both aquifers and pumped to an above-ground treatment system. Inorganic contaminants such as metals would be treated through ion exchange, precipitation with coagulation, and filtration. Organic contaminants would be treated through air stripping coupled to liquid and vapor phase carbon. Treatability studies would be performed to determine the optimum operating parameters for the groundwater treatment system. Residual waste from the treatment process such as sludges from the metals-treatment stage would be disposed of off site in accordance with all applicable or relevant and appropriate federal and state disposal requirements (e.g., RCRA Land Disposal Requirements (LDRs)); spent carbon used to remove organic contaminants would be handled similarly or regenerated.

Treated groundwater would be either reinjected into aquifers or discharged to the Massapequa Creek. Alternative GW-3 would also involve the continuation of the interim groundwater action called for in Alternative GW-2.

As with Alternative GW-2, the optimal location for the off-property groundwater treatment system would be between Woodward Parkway and the headwaters of the Massapequa Creek. Two groundwater extraction wells would be installed approximately 60 feet deep in the Upper Glacial aquifer and another two groundwater extraction wells would be installed approximately 180 feet deep in the Magothy aquifer. The total pumping rate of these four groundwater extraction wells would be approximately 250 gpm. An aquifer pumping test to evaluate the hydrogeological characteristics of the Magothy aquifer would need to be conducted as part of the design.

For cost-estimating purposes, it was assumed that the extracted groundwater would be treated to meet drinking water standards required for aquifer reinjection.

Approximately eight reinjection wells would be necessary. However, a detailed evaluation of groundwater reinjection would need to be conducted as part of the design effort.

The Plume B treatment system described under Alternative GW-2 would also pertain to Alternative GW-3.

The enhanced monitoring program provisions described under Alternative GW-2 would be carried out under Alternative GW-3.

In addition, the institutional controls and CERCLA five-year review required under Alternative GW-2 would also be required for Alternative GW-3.

Sediment Remedial Alternatives

As previously noted, based on the weight-of-evidence from the cumulative Massapequa Creek investigation, the remediation of site-related contamination within the Massapequa Creek ponds will be limited to Pond A. Sediment cleanup levels of 50 mg/kg cadmium and 260 mg/kg chromium were developed for remediation of Pond A sediments. These remedial goals were established in recognition of the site conceptual model, which indicates that if the groundwater contamination is addressed, the primary source of sediment and surface water contamination within the Massapequa Creek system will also be addressed. Moreover, removal of sediments within Pond A, the furthest upstream pond, where adverse ecological effects are greatest, would remove the primary source of contaminated sediments entering the creek below the site, and its lower ponds. While concentrations of chemicals in sediment and surface water exceeded ecologically-based benchmarks elsewhere in the stream system, little direct evidence of toxicity or other significant adverse effects was noted in these areas.

Alternative SD-1: No Action

Capital Cost:	$ N/A
Total Operation and Maintenance Cost:	$ 295,000
Present Worth Cost:	$ 295,000
Construction Time:	Immediately

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the sediment contamination within the Massapequa Creek ponds. However, this alternative does include the implementation of a Pond A sediment and surface water monitoring program. Quarterly sampling and analyses from Pond A sediment and surface water would be performed to assess the continued potential impact from the site groundwater contaminant

Because this alternative would result in site-related contaminants remaining in Pond A, CERCLA requires that the site be reviewed at least once every five years. If justified the review, remedial actions may be implemented to remove or treat the Massapequa Creek pond sediments.

Alternative SD-2: Excavation or Vacuum Extraction and Off-site Disposal of Contaminated Sediments from Pond A

Capital Cost:	$ 4,043,000
Total Operation and Maintenance Cost:	$ 294,000
Present Worth Cost:	$ 4,337,000
Construction Time:	1 year

Alternative SD-2 would involve the removal of contaminated sediments from Pond A by either excavation or vacuum extraction. If the sediments were removed by excavation, the pond would be dewatered and then excavated to a desired average depth of 1.5 feet, or a depth sufficient to collect the impacted fine-grained sediments, using conventional earth moving equipment. The underlying coarse sandy and gravelly sediments were found to be not impacted and, therefore, would not be removed. The surface water drained from the pond and stormwater would be diverted temporarily to a detention basin or Massapequa Creek. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. If sediment were to be removed by the vacuum extraction method, draining of the pond or the temporary diversion of surface water and stormwater would not be necessary.

Removal of sediments to a depth of 1.5 feet throughout Pond A (138,000 square feet or 3.2 acres) would generate approximately 7,700 cubic yards of impacted sediments. These sediments would be staged adjacent to the pond and dewatered using a combination of passive draining and active filtration. The excess porewater would be returned to the pond. It is estimated that the volume of dewatered sediment would be approximately 3,850 cubic yards (or about 50% of the wet volume). The substrate of the ponds and any impacted wetlands would be restored. The dewatered sediments (i.e., the filter cake consisting of compressed sediment) would undergo a sediment contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the sediment residue would be transported to an off-site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; and community and state acceptance. The evaluation criteria are described below.

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of federal and state environmental or facility siting laws, or provide grounds for invoking a waiver.

- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

- Reduction of toxicity, mobility, or volume through treatment addresses the preference for treatment and the anticipated performance of the treatment technologies that a remedy may employ with respect to these parameters.

- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

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

- Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

- State acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the selected remedy at the present time.

- Community acceptance will be assessed in the Record of Decision (ROD) and refers to the public's general response to the alternatives described in the Proposed Plan an the RI/FS reports.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, is as follows:

Soil Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SL-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. The contaminants identified in the soils would continue to migrate via all of the routes identified in the supplemental RI.

Alternative SL-3 would provide the greatest degree of overall protection because all 73,130 cubic yards of contaminated soils would be permanently removed from the site and disposed of at an off-site EPA-approved hazardous waste facility (some of the soils may need to be treated to satisfy LDR requirements). Alternative SL-2 would be less protective than Alternative SL-3 because under Alternative SL-2 some soil contamination above the cleanup levels would remain untreated beneath the cap. Alternative SL-2 would also require monitoring and institutional controls to ensure the integrity of the cap.

- Compliance with ARARs

This criterion is not applicable to the "no-action" alternative, Alternatives SL-1.

Alternatives SL-2 and SL-3 would comply with all ARARs, including the Long Island Landfill Law, RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities, RCRA LDRs, and the Department of Transportation manifest standards for transporters of hazardous waste, during the implementation of all on-site excavation and off-site disposal activities.

- Long-Term Effectiveness and Permanence

Alternative SL-1 would not provide any long-term effectiveness and permanence since it would not involve any measures for containing, controlling or eliminating any of the site soil contaminants, or reducing the potential for exposure to these contaminants.

Alternative SL-3 would provide the greatest degree of long-term effectiveness and permanence, as it would result in removal and off-site disposal of 73,130 cubic yards of contaminated soils from the site. Alternative SL-2 would be less effective over the long term because a smaller volume of contaminated soils (25,600 cubic yards) would be removed from the site. A maintenance and inspection program would be required for Alternatives SL-2 to ensure long-term of effectiveness of the caps.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative SL-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken to address toxicity, mobility, or volume.

Although Alternatives SL-2 and SL-3 do not employ any treatment technology, both of these alternatives employ an off-site disposal component that would result in reduction in toxicity, mobility, and volume of contamination at the site. Alternative SL-3 would provide greater reduction than Alternative SL-2, as Alternative SL-3 would result in the off-site disposal of 73,130 cubic yards of contaminated soils versus Alternative SL-2's 25,600 cubic yards of contaminated soils. Under both Alternatives SL-2 and SL-3, some of the soils may need to be treated to satisfy LDR requirements at an EPA-approved hazardous waste facility thereby reducing the toxicity and mobility of these contaminated materials at those locations.

- Short-Term Effectiveness

Alternative SL-1 would not include any construction and, therefore, would not present risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against principal site threats.

Both Alternatives SL-2 and SL-3 would involve varying degrees of excavating, moving, placing, and regrading of contaminated soils. Therefore, both of these alternatives would present some potential risks to on-site workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts associated, however, would be mitigated by utilizing appropriate conventional controls (e.g., dust suppression, mufflers, personal protection equipment, etc.). Both alternatives would also have potential impacts on the surrounding community as each of these alternatives involves the transport of contaminated soils from the site. The potential short-term risks would be greater for Alternative SL-3 because this alternative involves the transport of a much greater volume of contaminated soils.

- Implementability

Alternative SL-1 can be readily implemented, as it would not include any physical remedial measures to address the soil contamination at the site.

Alternatives SL-2 and SL-3 would be easily and equally implementable because both use conventional excavation and disposal technologies with proven reliability. Construction of the cap system specified in Alternative SL-2 can be accomplished using proven technologies; equipment, services and materials for this work would be readily available.

- Cost

The estimated capital, total operation and maintenance (O&M), and present worth-costs for each of Alternatives SL-1 through SL-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SL-1	$0	$0	$0
SL-2	$8,940,000	$344,000	$9,283,000
SL-3	$15,081,000	$196,000	$15,277,000

As indicated by the cost estimates, Alternative SL-1 has no associated cost, as it is a no-action alternative. Of the two action alternatives, Alternative SL-2 is less expensive than Alternative SL-3. The high cost associated with Alternative SL-3 is due to the excavation and off-site disposal of 73,130 cubic yards of contaminated soils as opposed to excavation and off-site disposal of 25,600 cubic yards of contaminated soils under Alternative SL-2.

- State Acceptance

NYSDEC concurs with the preferred alternative.

- Community Acceptance

Community acceptance of the preferred alternative would be assessed in the ROD following review of the public comments received on the supplemental RI/FS reports and the Proposed Plan.

Groundwater Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative GW-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. Groundwater contamination identified in the significantly-contaminated off-property portions of Plumes A and B would not be addressed, while the on-property portions of these plumes would only be addressed for the three-year period authorized under the non-time-critical removal action.

Alternatives GW-2 and GW-3 would be equally protective of human health and the environment through the permanent removal of VOCs and metals from the Upper Glacial Aquifer, and VOCs from the Magothy aquifer. Both of these alternatives would limit the migration of groundwater contaminants further downgradient, because the groundwater circulation wells associated with Alternative GW-2 or extraction wells associated with Alternative GW-3 would be designed to have overlapping capture zones and would provide effective capture of the groundwater contaminant plume.

- Compliance with ARARs

Both Alternatives GW-2 and GW-3 would comply with all ARARs, such as the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities, the Clean Air Act (e.g., ambient air quality standards), and the Department of Transportation manifest standards for transporters of hazardous waste. Alternative GW-3 would also need to comply with the drinking water standards for aquifer reinjection or limitations for discharge to Massapequa Creek. In addition, Alternatives GW-2 and GW-3 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls.

- Long-Term Effectiveness and Permanence

Alternative GW-1 would not provide any long-term effectiveness and permanence, as it would not address the remedial action objectives for the Liberty site.

Alternatives GW-2 and GW-3 would equally provide a high degree of long-term effectiveness and permanence through the removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative GW-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken under this alternative.

Alternatives GW-2 and GW-3 would equally provide a high reduction in toxicity, mobility, and volume through treatment, through the permanent removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer. Because both alternatives would be designed for plume capture, they would be equally effective in reducing the mobility of the contaminants.

- Short-Term Effectiveness

Alternative GW-1 would not include any construction measures and, therefore, would not present any risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against the threats posed by the contaminated groundwater.

Alternatives GW-2 and GW-3 would pose minimal potential adverse risks to the community, workers, and the environment over the short term. Potential risks for these alternatives would be those typically associated with construction activity, and an appropriate health and safety program would be established to minimize any such risks.

Alternative GW-3 would entail greater intrusive activities (e.g., additional trenching/piping activities to connect the extraction wells to the off-property groundwater treatment system) than Alternative GW-2 in the construction of their respective off-property groundwater treatment systems. The potential for any adverse short-term impacts associated with the construction activities, however, would be addressed by utilizing appropriate conventional and engineering controls (e.g., dust suppression, mufflers, personal protection equipment, etc.).

- Implementability

Alternative GW-1 would be the most readily implementable as it is a no-action alternative, followed in order by Alternatives GW-2 and GW-3.

Of the two action groundwater remedial alternatives, Alternative GW-2 would be the more readily implementable, as Alternative GW-2 would employ the same innovative technologies that are being used successfully for the interim groundwater action. Although Alternative GW-3 would involve conventional groundwater extraction and treatment which has been widely used with proven reliability, it would be more difficult to construct than Alternative GW-2 because of the size of the treatment plant and the amount of piping necessary to accommodate the high groundwater pumping rate. In addition, Alternative GW-3 would necessitate acquiring public or private property (between Woodward Parkway and the headwaters of the Massapequa Creek) to site the treatment system.

- Cost

The estimated capital, total O&M, and present-worth costs for each of Alternatives GW-1 through GW-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
GW-1	$183,000*	$1,080,000*	$1,263,000*
GW-2	$5,479,000*	$9,631,000*	$15,110,000*
GW-3	$5,829,000	$11,458,000	$17,287,000

* Includes the following costs for Plume B treatment system: capital cost of $1,273,000, total 20-year operation and maintenance cost of $1,404,000, and present worth cost of $2,677,000.

As indicated by the cost estimates, there is a significant cost increase between Alternative GW-1, the no-action alternative, and the other action alternatives, GW-2 and GW-3. Of the two action alternatives, Alternative GW-3 is more expensive than Alternative GW-2, due to the added O&M costs associated with a conventional groundwater extraction and treatment system.

- State Acceptance

NYSDEC concurs with the preferred alternative.

- Community Acceptance

Community acceptance of the preferred alternative would be assessed in the ROD following review of the public comments received on the supplemental RI/FS reports and the Proposed Plan.

Sediment Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SD-1 would provide no protection of ecological receptors, as it would not meet the remedial action objectives for the Liberty site; the contaminants identified in Pond A sediments would continue to pose a threat to ecological resources in this ecosystem. Alternative SD-2 would be fully protective of human health and the environment via permanent removal of 7,700 cubic yards of contaminated sediments in Pond A.

- Compliance with ARARs

This criterion is not applicable to the "no action" alternative, Alternative SD-1.

Alternative SD-2 would comply with all ARARs, including the NYSDEC surface water quality standards. In addition, due to associated off-property construction activities, Alternative SD-2 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls. Alternative SD-2 would also comply with the Department of Transportation manifest standards for transporters of hazardous waste and the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities

- Long-Term Effectiveness and Permanence

Alternative SD-1 would not provide any long-term, effective or permanent measures for containing, controlling or eliminating any of the contaminated sediments within Pond A, or reducing the potential for exposure to these contaminants. Alternative SD-2 would be effective in protecting ecological resources over the long term in that it would result in the permanent removal of 7,700 cubic yards of contaminated sediments from Pond A.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Because Alternative SD-1 is the "no-action" alternative, it would not result in any reduction in the toxicity, mobility, or volume of contaminants present in the impacted ecosystems. Alternative SD-2 would substantially reduce the volume, toxicity, and mobility of contaminants present in Pond A sediments, as a result of removal, and off-site transport and disposal of 7,700 cubic yards of contaminated sediments.

- Short-Term Effectiveness

Alternative SD-1 would not include any construction measures and, therefore, would not present potential risks or adverse short-term impacts to site workers or the environment as a result of its implementation. Alternative SD-2 would present some potential risks to workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts to site workers, however, would be readily mitigated by using personal protection equipment and following appropriate health and safety procedures. Alternative SD-2 would also present short-term impacts to wetlands, flora, and fauna. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. Following the implementation of Alternative SD-2, wetlands restoration would be required.

- Implementability

Alternative SD-1 can be readily implemented, as it would not include any physical remedial measures to address the Pond A sediments. Although Alternative SD-2 would use conventional excavation or vacuum extraction technologies which have proven reliability, it would be less readily implementable than Alternative SD-1, as Alternative SD-2 may require the resolution of issues that could arise from coordinating and consulting with state and local regulatory agencies (e.g., NYSDEC Bureau of Fisheries and Wildlife, Nassau County Department of Recreation and Parks, and Nassau County Department of Public Works). These issues would likely include delineation and restoration of sensitive or ecologically valuable wetlands.

- Cost

The estimated capital, total O&M, and present-worth costs for Alternatives SD-1 and SD-2 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SD-1	N/A	$295,000	$295,000
SD-2	$4,043,000	$294,000	$4,337,000

The costs associated with Alternative SD-1 are for a Pond A sediment and surface water monitoring program whereas the costs for Alternative SD-2 are for removal of contaminated sediments from Pond A.

- State Acceptance

NYSDEC concurs with the preferred alternative.

- Community Acceptance

Community acceptance of the preferred alternative would be assessed at the ROD following review of the public comments received on the supplemental RI/FS reports and the Proposed Plan.

PREFERRED REMEDIAL ALTERNATIVES

Based upon a comparative evaluation of the various remedial alternatives, EPA and the NYSDEC recommend Alternatives SL-2, GW-2, and SD-2 to address the contaminated soils, groundwater, and sediments, respectively.

The preferred soil Alternative SL-2 would involve the excavation and off-site disposal of approximately 25,600 cubic yards of the most highly contaminated soil, followed by capping of an area of approximately 9 acres where remaining soils would exceed soil cleanup levels.

The material targeted for excavation and removal includes contaminated soil at depths of 15 to 21 feet bgs which is in contact with the groundwater and which exceeds the groundwater protection soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium, as well as those soils with concentrations of cadmium and chromium above their respective groundwater protection soil cleanup levels which are handled in the process of excavation. In addition, any other soil which is characterized as RCRA hazardous waste would also be excavated and disposed of off site. A multi-layer cap would be placed above any remaining areas where cadmium and chromium concentrations of subsurface soils exceed their respective groundwater protection soil cleanup levels.

Under Alternative SL-2, existing soil contamination would be significantly mitigated and reduced to levels that would be protective of human health under future commercial industrial or recreational uses (western portion only) of the property. Because contaminated soils would be removed between 15 to 21 feet bgs, this alternative would also be protective of the underlying groundwater aquifers. Alternative SL-2 would be nearly as effective in meeting the remedial action objectives as Alternative SL-3, but could do so at a significantly lower cost.

The preferred groundwater Alternative GW-2 would involve the below-ground capture and treatment of the contaminated groundwater via innovative groundwater circulation wells coupled with air-stripping or granular activated carbon and metals-removal media. The preferred groundwater alternative would be equally as effective as Alternative GW-3 in achieving protection of human health and the environment over the long term, but could do so at a lower cost.

EPA's preferred sediment remedial alternative to address the localized contaminated sediments in the Massapequa Creek ponds is Alternative SD-2, excavation and off-site disposal of contaminated sediments from Pond A. Alternative SD-2 would result in the removal of a significant volume of site-related contamination from this ecosystem.

In summary, EPA believes that Alternatives SL-2, GW-2, and SD-2 will provide the best balance of trade-offs among alternatives with respect to the evaluation criteria. EPA and NYSDEC believe that the preferred alternatives would be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred soil alternative would meet the statutory preference for the use of treatment as a principal element, to the degree that treatment would be required prior to disposal at an off-site EPA-approved hazardous waste facility. The preferred groundwater alternative would also meet the statutory preference for the use of treatment as a principal element. The preferred sediment alternative would aid in the restoration of Pond A of the Massapequa Creek ecosystem.

In addition, as explained above, the supplemental RI data indicate that the easternmost four acres of the site and the site property bordering Ellsworth Allen Park (excluding the Northwest Disposal Area) meet the remedial action objectives for soil and groundwater and, therefore, no remedial action would be necessary for these areas.