Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Hazardous Waste Disposal Site
Farmingdale, Suffolk County, New York
Site Number 1-52-113

December 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Hazardous Waste Disposal Inactive Hazardous Waste Disposal Site
Farmingdale, Suffolk County, New York
Site No. 1-52-113

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Hazardous Waste Disposal (HWD) Site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the HWD inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the HWD Site and the criteria identified for evaluation of alternatives, the NYSDEC has selected soil treatment using either *in situ* chemical oxidation or soil vapor extraction (SVE) and groundwater treatment using either *in situ* chemical oxidation or air sparging. The components of the remedy are as follows:

- A remedial design program to provide the details necessary to implement the remedial program.

- Treatment of source area soils to SCGs (defined in Section 5.1 of this document) to protect groundwater and reduce migration of volatile organic compounds (VOCs) through the soil gas using one of the following methods: *In situ* chemical oxidation using potassium permanganate, or similar oxidant; or SVE with off-gas treatment to meet applicable discharge requirements.

- Treatment of on-site and off-site groundwater to reduce total VOC concentrations to upgradient concentrations by either of the following methods: *in situ* chemical oxidation using potassium permanganate, or similar oxidant; or air sparging with off-gas treatment to meet applicable discharge requirements.

- A pre-design investigation to determine the extent of the downgradient groundwater plume and the optimum location for the injection/air sparging wells and performance monitoring wells.

- Verification sampling of treated soil and groundwater to confirm the effectiveness of the remedial actions.

- Continued operation, maintenance and monitoring of the active slab depressurization (ASD) system interim remedial measure (IRM) to reduce tetrachloroethene (PCE) concentrations in indoor air at the former R&D Carpet and Tile building to ambient background levels.

- Development of a site management plan to address residual contamination and any use restrictions.

- Imposition of an environmental easement.

- Annual certification of the institutional and engineering controls.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

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

DEC 30 2004

Date

Dale A. Desnoyers, Director
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RECORD OF DECISION

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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the Hazardous Waste Disposal (HWD) Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, the operation of a hazardous waste storage, transfer and recycling facility have resulted in the disposal of hazardous wastes, including VOCs. These wastes have contaminated the soil, soil gas, and groundwater at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated soils and current exposure to contaminated soil gas.

- a significant environmental threat associated with the impacts of contaminants to the groundwater resource in the upper glacial aquifer.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- A remedial design program to provide the details necessary to implement the remedial program.

- Treatment of source area soils to SCGs (defined in Section 5.1 of this document) to protect groundwater and reduce migration of VOCs through the soil gas using one of the following methods: *In situ* chemical oxidation using potassium permanganate, or similar oxidant; or SVE with off-gas treatment to meet applicable discharge requirements.

- Treatment of on-site and off-site groundwater to reduce total VOC concentrations to upgradient concentrations by either of the following methods: *in situ* chemical oxidation using potassium permanganate, or similar oxidant; or air sparging with off-gas treatment to meet applicable discharge requirements.

- A pre-design investigation to determine the extent of the downgradient groundwater plume and the optimum location for the injection/air sparging wells and performance monitoring wells.

- Verification sampling of treated soil and groundwater to confirm the effectiveness of the remedial actions.

- Continued operation, maintenance and monitoring of the ASD system IRM to reduce PCE concentrations in indoor air at the former R&D Carpet and Tile building to ambient background levels.

- Development of a site management plan to address residual contamination and any use restrictions.

- Imposition of an environmental easement.

- Annual certification of the institutional and engineering controls.

The remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The HWD Site is located at 11A Picone Boulevard in the Village of Farmindale, Suffolk County, as shown on Figure 1. The site is approximately one half acre in size and includes the area where hazardous waste storage, transfer, and recycling operations were historically conducted. This area of the site is now covered by a concrete slab and is currently used as a truck/tractor-trailer parking lot. Access to the site is limited by a chain-link fence to the north, east and south of the site, and a concrete wall associated with a storage yard to the west of the site.

Land use in the vicinity of the site is commercial/industrial. A recharge basin is located to the northeast and Picone Boulevard borders the site to the south. Parking lots and commercial facilities are present south, east and west of the site. The site features and historical limits of operation are shown on Figure 2.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

HWD, Inc. operated as a hazardous waste storage, transfer and recycling facility at the site from approximately 1979 to 1982. Hazardous wastes (primarily spent solvents and acidic wastes) were collected from off-site generators, transported to the site by HWD, Inc. and stored on site prior to off-site transport and disposal. Spent solvents were also recycled for resale. Hazardous wastes stored on the site were managed in 55-gallon drums, one or more aboveground storage tanks and a "sludge pit".

The United States Environmental Protection Agency (USEPA) performed an inspection of the facility in 1981 and noted the presence of 1,900 55-gallon drums of spent solvent and a 2,500-gallon acid tank. The USEPA reported that the majority of the drums were leaking at the time of the inspection. The Suffolk County Department of Health Services noted the presence of spills in the storage area during a 1982 inspection. Under an Order on Consent with the NYSDEC, hazardous waste management operations ceased at the site in 1982. All remaining wastes and waste management tanks were removed from the site during 1984.

3.2: Remedial History

In 1985, the NYSDEC first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a is a temporary classification assigned to a site that has inadequate and/or insufficient data for inclusion in any of the other classifications. A Phase I Investigation was conducted by the NYSDEC in 1988 which includes a site inspection, data and records search, assessment and interviews. Results of this investigation are contained in the Phase I Investigation Report dated 1988. The NYSDEC conducted a Phase II Investigation in 1990 which included a site reconnaissance, installation and sampling of four groundwater monitoring wells, collection of soil samples from six borings, and the collection of surface water and sediment samples. The results of this investigation are presented in the Phase II Investigation Report, December 1991. Based on the results of the Phase II Investigation, in 1992, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and eighty-six of the PRPs who generated hazardous wastes that were disposed of at the site entered into a Consent Order effective October 12, 1999. The Order obligates the responsible parties to implement a RI/FS remedial program. Upon issuance of the ROD the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between November 1999 and February 2001. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Research of historical information;
- Geophysical survey to determine the presence and location of subsurface drainage structures and other subsurface structures;
- Installation of 4 soil borings and 4 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Sampling of 11 new and existing monitoring wells;
- Collection of approximately 66 discrete groundwater samples using a *Hydropunch*;
- Collection of approximately 24 discrete soil samples using a direct push technique;
- Collection of approximately 22 discrete soil samples using a conventional drill rig; and
- A survey of public and private water supply wells in the area around the site.

To supplement the information collected during the RI, a supplemental soil investigation and soil vapor survey/air pathway evaluation were conducted in August 2002 and additional groundwater investigation activities were conducted during April 2003. The findings of these investigations are presented in the FS report.

The following activities were conducted during the supplemental RI activities:

- Collection of approximately 14 discrete soil samples on-site using a direct push technique;
- Installation and sampling of an additional downgradient monitoring well;
- Completion of a soil gas survey and evaluation of possible vapor exposure pathways;
- Collection of indoor air samples from three buildings adjacent to the site.

To determine whether the soil, groundwater, and indoor air contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC “Ambient Water Quality Standards and Guidance Values” and Part 5 of the New York State Sanitary Code.
- Soil SCGs are based on the NYSDEC “Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".
- Air SCGs for PCE are based on the NYSDOH fact sheet “Tetrachloroethene (PERC) in Indoor and Outdoor Air”.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI and FS reports.

5.1.1: Site Geology and Hydrogeology

The surface of the site generally consists of 6 to 8 inches of concrete. Fill material is present below the concrete consisting of brick and concrete fragments or fine to coarse sand and medium to coarse gravel to a maximum depth of seven or eight feet below grade. Below the fill is the upper glacial unit consisting of fine to coarse grained sand and gravel.

There are two primary aquifers beneath the site: the upper glacial aquifer and Magothy aquifer. The upper glacial aquifer is approximately 100 feet in thickness in the vicinity of the site with an average horizontal hydraulic conductivity of approximately 270 feet per day. Groundwater has been encountered at depths ranging from approximately 10 to 13 feet beneath the site with flow generally towards the southeast. However, east-southeast of the site there is a prominent component of groundwater flow to the west and southwest. Figure 3 shows the shallow groundwater contour lines. The Magothy aquifer is regionally separated from the overlying upper glacial aquifer by the Gardiner's clay unit. This clay unit was not confirmed during the RI. The Magothy serves as the predominant aquifer for public water supply in the region.

A recharge basin is located approximately 80 to 100 feet north-northeast of the site. Three manholes/catch basins convey storm water runoff from the site to the recharge basin. The Fairchild Republic Site is located approximately 700 feet to the south and is hydraulically downgradient from the site.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs).

The VOCs of concern are tetrachloroethene (PCE) and its breakdown products trichloroethene (TCE) and 1,2-dichloroethene (1,2-DCE).

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for soil, and micrograms per cubic meter ($\mu g/m^3$) for air samples. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in soil, groundwater, soil gas and indoor air and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Subsurface Soil

Subsurface soils were sampled from thirty locations on-site to evaluate the nature and extent of chemical constituents in the soil. Sample locations targeted areas where past site operations were believed to have occurred. Sample depths ranged from 0'-2' to 12'-14' below the concrete pavement, depending on the field screening and visual observation. Initially twelve soil borings were analyzed for VOCs, SVOCs, PCBs, and metals. VOCs were the only compounds detected significantly above cleanup objectives, therefore, subsequent soil borings were only analyzed for VOCs. Only two SVOCs were detected slightly above cleanup objectives: benzo(a)pyrene and phenol, no PCBs were detected above cleanup objectives, and, although a few metals were detected above cleanup objectives, they are within typical New York State background levels and are not considered to be site related.

PCE was the primary VOC detected on-site. Figure 4 shows the locations where PCE was detected above the soil cleanup objective of 1.4 ppm. The highest PCE detection is 440 ppm from sample GP-9A (0'-2'). In general, concentrations are highest in the 0'-2' zone and decrease with depth. The highest detection near the water table is 37 ppm from sample GP-5B (9'-11'). In general, detections above the cleanup objective are located in the central portion of the site, as defined by the area shown on Figure 4, to a maximum depth of 11 feet.

Groundwater

Eleven new and existing monitoring wells were sampled during the RI/FS. Three of these wells are located on-site (MW-2, MW-2D and MW-7) with the remainder off-site, as shown on Figure 3. All wells are screened at the water table, except MW-2D, MW-1D and MW-3D which were screened at a deeper interval, approximately 40-50 feet below ground surface. The initial round of groundwater samples (January 2000) were analyzed for VOCs, SVOCs, PCBs, and metals. No SVOCs or PCBs were detected in on-site wells above groundwater standards. Although some metals were detected in on-site wells, the samples appear to be consistent with typical background concentrations in the vicinity of the site. Therefore, additional rounds of groundwater smples were only analyzed for VOCs (February 2001 and March 2003).

Of the VOCs detected in the groundwater samples, PCE was the primary compound identified. In the two shallow on-site wells, PCE concentrations were above the groundwater standard of 5 ppb ranging from 68 ppb to 2,600 ppb, with a general increasing trend from January 2000 to March 2003. MW-8, located approximately 45 feet downgradient of the site, contained 970 ppb PCE (March 2003). PCE was not detected in the deeper downgradient well, MW-3D, indicating that groundwater contamination appears to be limited to the shallow interval in the vicinity of the site. Inferred total VOC groundwater isoconcentration lines for the source area are shown on Figure 5. The downgradient extent of the plume beyond MW-8 and MW-3D has not been defined. PCE was detected in two upgradient wells, MW-1 and MW-6, up to 50 ppb and 120 ppb, respectively, indicating some groundwater impact from off-site sources.

The on-site and off-site groundwater was also sampled from sixteen locations using a *Hydropunch* method as shown on Figure 6. Samples were collected at the water table and at several deeper intervals to a maximum depth of 120 feet to evaluate any impacts to the groundwater vertically. Detections from the deeper zones were relatively low with the highest PCE detection at 120 ppb from sample location HP-7 at 90 feet below ground surface.

Soil Gas

Soil gas samples were collected from seven soil borings installed between the HWD site and the R&D Carpet and Tile, Fort Brand Service, and Ryder Truck buildings to determine if VOCs were migrating off-site through the soil vapor space potentially impacting these buildings. PCE was detected in all seven samples ranging from 82 $\mu g/m^3$ in sample SV-1 to 670,000 $\mu g/m^3$ in sample SV-2. The sample locations with corresponding PCE concentrations are shown on Figure 7. There is currently no cleanup objectives or guidance values for compounds in soil gas. However, the relatively high PCE concentrations in samples SV-2, SV-3 and SV-5, located between the site and the R&D Carpet and Tile Building, suggests that the site is impacting this building.

Air

The NYSDOH initially collected indoor air samples at the R&D Carpet and Tile, Fort Brand Service, and Ryder Truck buildings in January 2002 to determine if these buildings were potentially being impacted from the site by PCE migration through the soil vapor. Fort Brand and R&D Carpet and Tile both contained PCE concentrations above the NYSDOH ambient air guideline of 100 $\mu g/m^3$, as shown on Figure 7. Additional indoor air samples were collected and building surveys were performed to determine if the source could be from within the buildings. Based on the additional evaluations, the PCE levels present in the R&D Carpet and Tile building appear to be site related. This building had higher PCE levels in the lobby and secretary areas (890 $\mu g/m^3$ and 780 $\mu g/m^3$, respectively) which are in close proximity to the highest soil gas detections. There is also insufficient evidence of a use of PCE within this building.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. At the request of the NYSDEC, IRMs were conducted by the PRPs to reduce the PCE concentrations detected within the R&D Carpet and Tile Building. Initial measures consisted of the placement of temporary carbon air purifiers within this building in January/February 2003, followed by modifications to the building's HVAC system in May 2003. Further indoor air sampling indicated that neither of these measures were consistently effective in reducing PCE levels within the building, therefore, at the request of the NYSDEC, the PRPs installed an ASD system within the building in September 2004. The purpose of the ASD system is to provide a negative pressure beneath the building floor slab thereby abating the migration of PCE vapors into the building. In December 2004, the building was no longer occupied by R&D Carpet and Tile and was undergoing renovation for a future tenant.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5 of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

There are both completed and potential exposure pathways at the site. The completed exposure pathway is:

- inhalation of vapors in indoor air from contaminated soil gas.

PCE indoor air contamination was originally detected at the R&D Carpet and Tile company in January 2002 at levels as high as 890 ug/m^3. Measures were put in place over the next two years that were designed to reduce the amount of PCE detected in the indoor air, but were not completely effective in consistently reducing the PCE indoor air levels below the NYSDOH ambient air guideline. Therefore, in September 2004 an ASD system was installed in the building to provide a negative pressure beneath the building floor slab thereby abating the migration of PCE vapors into the building.

Potential exposure pathways are:

- dermal contact with contaminated soil; and

- ingestion of contaminated groundwater.

Dermal contact with contaminated soils are not expected since the site is covered with pavement or buildings. Site groundwater is not currently used for drinking, but groundwater could be used in the future since there is no restrictions in place to prevent its use. Although the ingestion of

contaminated groundwater is a potential exposure pathway, the ingestion of contaminated groundwater is not expected because the surrounding area is serviced by municipal water.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

No current pathways for environmental exposure have been identified for this site as the site is located in a commercial setting and there are no natural surface water bodies (streams, rivers or lakes) within one mile of the site. Therefore a viable exposure pathway to fish and wildlife receptors is not present. Site contamination has impacted the groundwater resource in the upper glacial aquifer. While the upper glacial aquifer is not used as drinking water in the vicinity of this site, it is considered a resource with its best potential use as drinking water. Also, the upper glacial aquifer can potentially impact the Magothy aquifer which is a source of public drinking water.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to VOCs in subsurface soils;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards;
- the release of contaminants from soil into indoor air, through soil vapor;
- the risk of ingestion of groundwater affected by the site that does not attain drinking water standards; and
- off-site migration of groundwater that does not attain groundwater quality standards.

Further, the remediation goals for the site include attaining to the extent practicable:

- Ambient groundwater quality standards, and
- SCGs for soils.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Hazardous Waste Disposal Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.
A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soil, soil gas, indoor air and groundwater at the site.

Alternative 1: No Action

Present Worth: *$447,000*
Capital Cost: *$0*
Annual OM&M:
(Years 1-30): *$36,000*

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: In-Situ Soil Chemical Oxidation and In-Situ Groundwater Chemical Oxidation

Present Worth: *$1,860,000*
Capital Cost: *$1,720,000*
Annual OM&M:
(Years 2-3): *$72,000*

In situ chemical oxidation involves an irreversible process in which target VOCs would react with oxidant to produce innocuous substances such as carbon dioxide, water and inorganic chloride. Reaction intermediates may also occur. As this treatment takes place below the ground surface, VOCs are not intentionally extracted and handled or transferred to another media. This alternative would involve the introduction of an oxidant into the subsurface to treat VOCs in unsaturated soils to SCGs and VOCs in on-site and off-site groundwater to upgradient concentrations. The soil would

be treated by injection of an aqueous solution of oxidant into the subsurface soils via a distribution system such as an infiltration gallery or injection wells. The depth of soil to be treated would extend from below the concrete pavement to the water table (approximately 10 feet to 13 feet below grade) over an approximately 50 foot by 100 foot area of the site, treating approximately 2,400 cubic yards of soil. The groundwater would be treated by delivering the oxidant into the aquifer by a network of vertical injection wells. It is estimated that treatment would take approximately one year (four quarterly injections) with two years of groundwater performance monitoring. However, actual injection frequencies and time frame will depend on pre-design activities and confirmatory sampling conducted in connection with the treatment.

This alternative would also include the continued operation, maintenance and monitoring of the ASD system IRM at the former R&D Carpet and Tile building to reduce PCE concentrations in indoor air until the source area remediation has been effectively completed. This alternative would also include the development of a site management plan to restrict the use of the property, the use of the groundwater, imposition of an institutional control in the form of an environmental easement on the property, and annual certification that the institutional and engineering controls remain effective. Once soil and groundwater concentrations are treated to unrestricted use levels, the appropriate engineering and institutional controls could be removed.

Alternative 3: Soil Vapor Extraction (SVE) and In-Situ Groundwater Chemical Oxidation

Present Worth: *$2,010,000*
Capital Cost: *$1,440,000*
Annual OM&M:
(Years 2-7): *$102,000*
(Years 8-9): *$72,000*

SVE is an *in situ* process where VOC contaminants present in unsaturated soil are removed by physically applying a vacuum to the subsurface. The vacuum creates air movement and the contaminants are volatilized and drawn through a vapor treatment system. This alternative would apply this technology to reduce VOCs in soils to SCGs by installing a network of extraction wells in the source area. The same area/volume of soil would be treated as in Alternative 2. Vapors extracted from the wells would be conveyed to an on-site treatment system, assumed to consist of vapor-phase granular activate carbon (GAC), prior to discharge through an exhaust stack. The number and location of extraction wells would be determined through pilot testing during the design phase. It is estimated that treatment would take approximately three to five years to complete.

Groundwater would be treated to upgradient concentrations by *in situ* chemical oxidation, similar to Alternative 2. This alternative would also include the continued operation, maintenance and monitoring of the ASD system IRM and the engineering and institutional controls described in Alternative 2. Once soil and groundwater concentrations are treated to unrestricted use levels, the appropriate engineering and institutional controls would be removed.

Alternative 4: Soil Vapor Extraction and Groundwater Air Sparging

Present Worth: *$1,980,000*

Capital Cost: *$840,000*
Annual OM&M:
(Years 2-7): *$222,000*
(Years 8-9): *$72,000*

This alternative would involve SVE to reduce VOCs in the source area soils to SCGs, similar to Alternative 3, and groundwater treatment using air sparging. Air sparging involves the injection of air into the groundwater through a series of injection wells to strip VOCs out of the groundwater. Sufficient air sparge wells would be installed on and off-site to reduce total VOCs in groundwater to upgradient concentrations. The air injected on-site would be collected by the SVE wells and treated through that system. The air injected off-site would either be discharged to the on-site SVE system or through a stack and would be treated, as necessary, to meet air discharge criteria. This alternative would also include the continued operation, maintenance and monitoring of the ASD system IRM and the engineering and institutional controls described in Alternative 2. Once soil and groundwater concentrations are treated to unrestricted use levels, the appropriate engineering and institutional controls can be removed.

Alternative 5: Asphalt Cap and Groundwater Extraction and Treatment

Present Worth: *$5,490,000*
Capital Cost: *$1,370,000*
Annual OM&M:
(Years 1-30): *$411,000*

This alternative involves the construction of an engineered cap over the majority of the site with extraction and on-site treatment of contaminated groundwater. The cap would be constructed over the existing concrete pavement, to mitigate human exposure to VOC impacted soils, and would consist of an impermeable membrane, to minimize infiltration of water into the subsurface. The cap would cover an area of approximately 12,000 square feet. Groundwater extraction wells would be installed downgradient of the site to capture the VOC plume to upgradient concentrations. Extracted groundwater would be treated through a low profile air stripper with the exhaust treated through a catalytic oxidizer and/or GAC vessels. The treated water would be discharged to the sanitary sewer, recharge basin or re-injected to groundwater depending on the actual flow rate.

This alternative would include a long-term monitoring program to insure the cap and groundwater treatment remains effective. The continued operation, maintenance and monitoring of the ASD system IRM and the engineering and institutional controls described in Alternative 2 would also apply, but would continue long-term.

Alternative 6: Soil Excavation and Off-site Incineration/Disposal and Groundwater Extraction and Treatment

Present Worth: *$7,300,000*
Capital Cost: *$3,570,000*
Annual OM&M:
(Years 1-30): *$378,000*

This alternative involves the excavation of impacted soils with transport off-site for incineration/disposal with groundwater extraction and treatment. Approximately 1,300 cubic yards of unsaturated soil would be excavated from the source area with excavation depths varying from approximately 6 feet to 13 feet below ground surface depending on location. Verification samples would be collected to insure VOC concentrations in remaining soils were below SCGs. Based on the anticipated excavation depths and sandy soils, it is assumed that sheetpiling would be installed to support the excavation sidewalls. Excavated soils would be stockpiled for waste characterization. Based on the VOC content, soils would be disposed of either to a hazardous or non-hazardous waste landfill or transported to an off-site incineration facility. Excavated areas would be restored by backfilling with clean fill material and re-paving.

The groundwater extraction and treatment system would be similar to that described for Alternative 4. This alternative would also include the continued operation, maintenance and monitoring of the ASD system IRM and the engineering and institutional controls described in Alternative 2. Once soil and groundwater concentrations are treated to unrestricted use levels, the appropriate engineering and institutional controls can be removed.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs).Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of

the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised.

In general, the public comments received were supportive of the selected remedy. Several comments were received, however, pertaining to the cleanup objectives for soil and groundwater, the ASD system IRM, need for a pilot test and various modifications to the language in the ROD. Based on these comments, language in the ROD has been modified, as appropriate, as indicated in the responsiveness summary.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected either Alternative 2 or Alternative 4 as the remedy for this site: soil treatment using either *in situ* chemical oxidation or SVE and groundwater treatment using either *in situ* chemical oxidation or air sparging as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

A choice of either Alternative 2 or 4 has been selected because, as described below, they satisfy the threshold criteria and provide the best balance of the primary balancing criteria described in Section 7.2. Either alternative will achieve the remediation goals for the site by treating on-site soils to

SCGs, greatly reducing the source of contamination to groundwater, and creating the conditions needed to restore groundwater quality to the extent practicable. Alternative 1, no action, would not be protective of human health as it would not address potential human exposure to impacted soils and the current indoor air exposure. Alternatives 3, 5 and 6 would also comply with the threshold selection criteria but to a lesser degree or with lower certainty.

Because all the action alternatives satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 (chemical oxidation), 3 (SVE/chemical oxidation), 4 (SVE/air sparging) and 5 (capping/groundwater extraction & treatment) all would have short-term impacts which could easily be controlled. For Alternative 6 (excavation/groundwater extraction & treatment) these risks would be slightly greater due to the excavation and handling of impacted soils. All alternatives would require vapor intrusion controls at the former R&D Carpet and Tile building during implementation; however, reliance on these controls would be less for Alternatives 3 and 4 due to operation of an SVE system. Alternative 2 would achieve remedial goals the fastest followed by Alternatives 3 and 4, since SVE and air sparging would take longer to achieve remedial goals than chemical oxidation. Alternatives 5 and 6 would take the longest to achieve remedial goals for groundwater.

Achieving long-term effectiveness is best accomplished by excavation and removal of the contaminated overburden soils (Alternative 6). However, the long-term effectiveness of Alternatives 2, 3, and 4 is similar to Alternative 6 as soils would be treated to SCGs. The long-term effectiveness would be lowest for Alternative 5 as contaminated soils would remain on-site and would require long-term maintenance of the cap and continued operation, maintenance and monitoring of the vapor intrusion controls on the former R&D Carpet and Tile building.

With regard to reduction in toxicity, mobility and volume the least favorable alternative is Alternative 5, since contaminated soil would be capped on-site only reducing contaminant mobility. The remaining action alternatives would be similar for this criteria as soil contamination would be treated or removed to SCGs and groundwater contamination treated to upgradient concentrations.

All alternatives involve common technologies that are readily available and implementable, however there is some uncertainty in the effectiveness of the chemical oxidation for treatment of unsaturated soils under Alternative 2. Although chemical oxidation has been proven successful for treatment of contaminated groundwater, it has not been well demonstrated for treatment of unsaturated soils and its effectiveness would have to be carefully monitored at this site. Alternatives 5 and 6 would be more difficult to implement than the other alternatives as Alternative 5 would require construction and long-term maintenance of a site cap and Alternative 6 would require the excavation and transportation of soils and may require the use of sheetpiling during excavation.

The cost of the alternatives varies significantly. Alternatives 5 and 6 would be the most expensive to implement primarily because of the long-term costs of operation, maintenance and monitoring of the groundwater extraction and treatment system. Of the remaining alternatives, Alternative 2 would most likely be the least expensive to implement as this alternative would achieve SCGs in the shortest time requiring less operation, maintenance and monitoring. The cost to construct Alternatives 3 and 4 would be lower than Alternative 2, but the total cost to implement these

alternatives would be slightly higher because of the longer time necessary to operate the treatment systems.

The estimated present worth cost to implement the remedy is $1,860,000 for chemical oxidation or $1,980,000 for SVE/air sparging. The cost to construct the remedy is estimated to be $1,720,000 for chemical oxidation or $840,000 for SVE/air sparging and the estimated average annual operation, maintenance, and monitoring costs for 3 years is $72,000 for chemical oxidation or $222,000 for 7 years for SVE/air sparging.

The elements of the selected remedy, as shown on Figure 8, are as follows:

- A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

- Treatment of source area soils to SCGs to protect groundwater and reduce migration of VOCs through the soil gas using one of the following methods: *In situ* chemical oxidation using potassium permanganate, or similar oxidant; or SVE with off-gas treatment to meet applicable discharge requirements.

- Treatment of on-site and off-site groundwater to reduce total VOC concentrations to upgradient concentrations by either of the following methods: *in situ* chemical oxidation using potassium permanganate, or similar oxidant; or air sparging with off-gas treatment to meet applicable discharge requirements.

- A pre-design investigation to determine the extent of the downgradient groundwater plume and the optimum location for the injection/air sparging wells and performance monitoring wells.

- Verification sampling of treated soil and groundwater to confirm the effectiveness of the remedial actions.

- Continued operation, maintenance and monitoring of the ASD system IRM to reduce PCE concentrations in indoor air at the nearby former R&D Carpet and Tile building to ambient background levels.

- A site management plan will be developed to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; and (c) identify any use restrictions.

- Imposition of an institutional control in form of an environmental easement that will (a) require compliance with the approved site management plan; (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality

treatment; and (d) require the property owner to complete and submit to the NYSDEC an annual certification.

- The property owner would provide an annual certification, prepared and submitted by a professional engineer or such other expert acceptable to the NYSDEC, until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would contain certification that the institutional controls and engineering controls are still in place, allow the NYSDEC access to the site, and that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan. Once soil concentrations are treated to unrestricted use levels and groundwater is treated to either unrestricted use levels or to upgradient concentrations, the NYSDEC will consider discontinuing the need for an annual certification.

- The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.

- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.

- A fact sheet was sent to the public contact list announcing the start of the project and availability of the RI/FS work plan.

- A fact sheet was sent to the public contact list summarizing the PRAP and announcing the public meeting for the PRAP.

- A public meeting was held on September 28, 2004 to present and receive comment on the PRAP.

- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination
November 1999 - April 2003

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	0.001-440	1.4	17/60
	trichloroethene	0.001-3.5	0.7	2/60
	1,2-dichloroethene	ND[d]-1.0	0.3	0/60

GROUNDWATER (Hydropunch Samples)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	0.7-320	5	31/66
	trichloroethene	0.7-22	5	5/66
	1,2-dichloroethene	0.4-21	5	4/66

GROUNDWATER (Monitoring Wells)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	0.8-2,600	5	5/11
	trichloroethene	1-48	5	3/11
	1,2-dichloroethene	0.5-38	5	4/11

SOIL GAS	Contaminants of Concern	Concentration Range Detected ($\mu g/m^3$)[a]	SCG[b] ($\mu g/m^3$)[a]	Total No. of Samples
Volatile Organic Compounds (VOCs)	tetrachloroethene	83-670,000	NA	7
	trichloroethene	190-35,000	NA	7
	1,2-dichloroethene	270-9,700	NA	7

INDOOR AIR (Pre-HVAC Upgrade)	Contaminants of Concern	Concentration Range Detected ($\mu g/m^3$)[a]	SCG[b,c] ($\mu g/m^3$)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	22-1,037	100/ background	4/7

TABLE 1 (cont.)
Nature and Extent of Contamination
August 2003 - December 2003

INDOOR AIR (Post-HVAC Upgrade)	Contaminants of Concern	Concentration Range Detected ($\mu g/m^3$)[a]	SCG[b,c] ($\mu g/m^3$)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	<2.1-160	100/ background	2/3

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter.

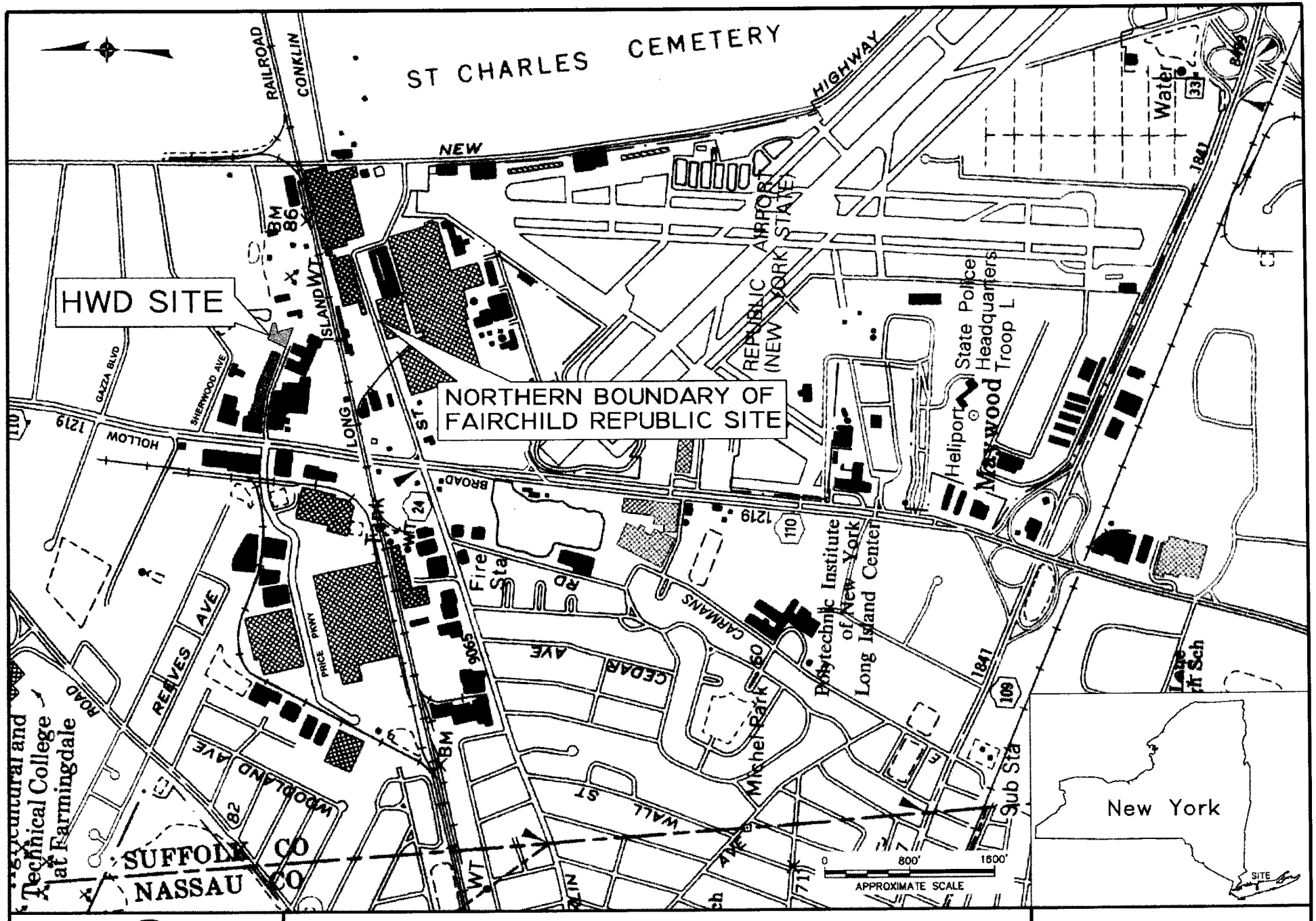
[b] SCG = standards, criteria, and guidance values.

[c] The NYSDOH *Tetrachloroethene in Indoor and Outdoor Air* fact sheet states "that the average air level in a residential community not exceed 100 micrograms of PERC per cubic meter of air (100 $\mu g/m^3$), considering continuous lifetime exposure and sensitive people. Reasonable and practical actions should be taken to reduce PERC exposure when indoor air levels are above background, even when they are below the guideline of 100 $\mu g/m^3$. The goal of the recommended actions is to reduce PERC levels in indoor air to as close to background as practical."

[d] ND = non-detect.

Table 2
Remedial Alternative Costs

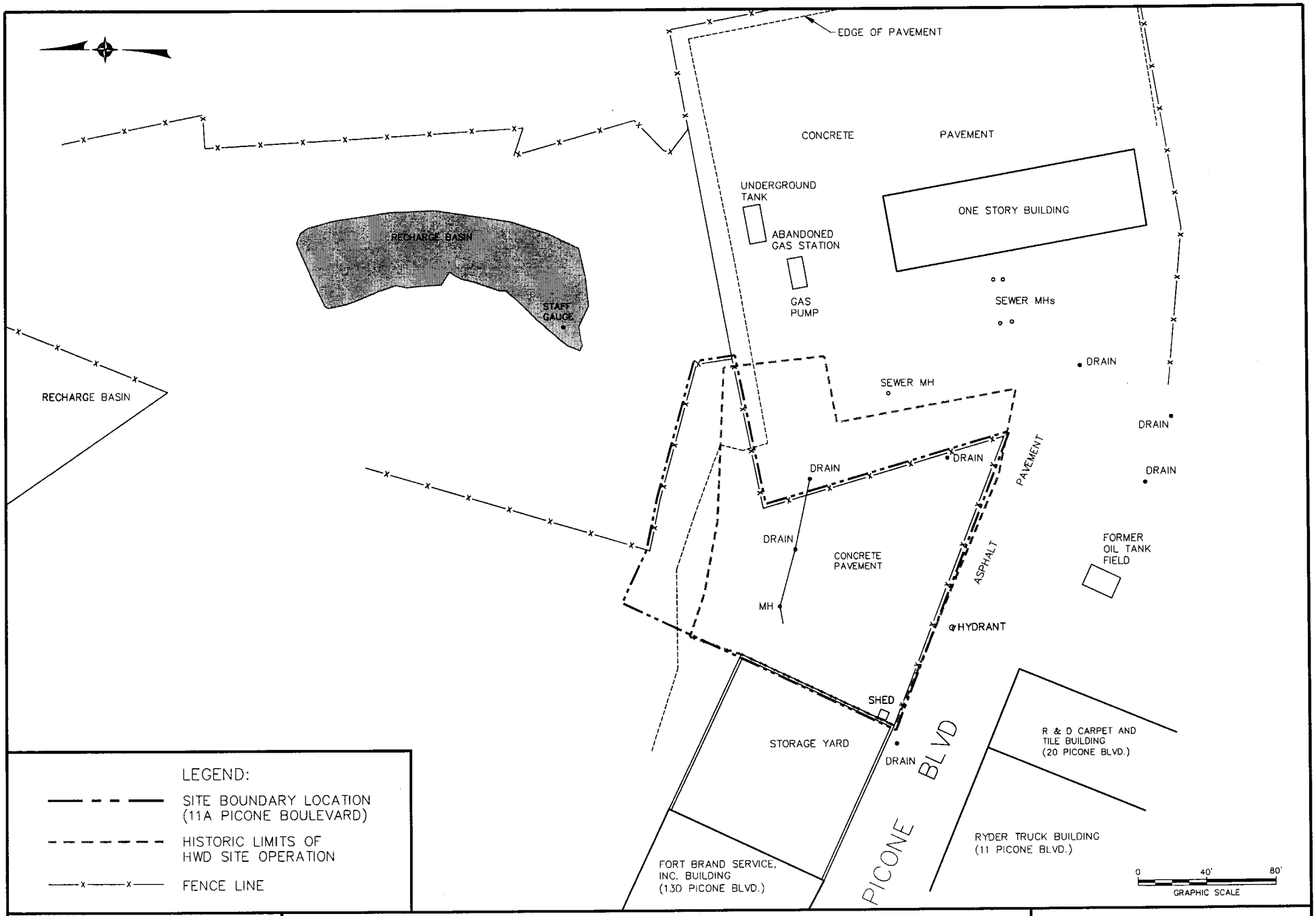
Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
1. No Action	$0	$36,000	$447,000
2. In-Situ Chemical Soil Oxidation and In-Situ Groundwater Chemical Oxidation	$1,720,000	$72,000	$1,860,000
3. Soil Vapor Extraction and In-Situ Groundwater Chemical Oxidation	$1,440,000	$102,000	$2,010,000
4. Soil Vapor Extraction and Groundwater Air Sparging	$840,000	$222,000	$1,980,000
5. Asphalt Cap and Groundwater Extraction and Treatment	$1,370,000	$411,000	$5,490,000
6. Soil Excavation and Off-site Incineration/Disposal and Groundwater Extraction and Treatment	$3,570,000	$378,000	$7,300,000



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SITE LOCATION MAP

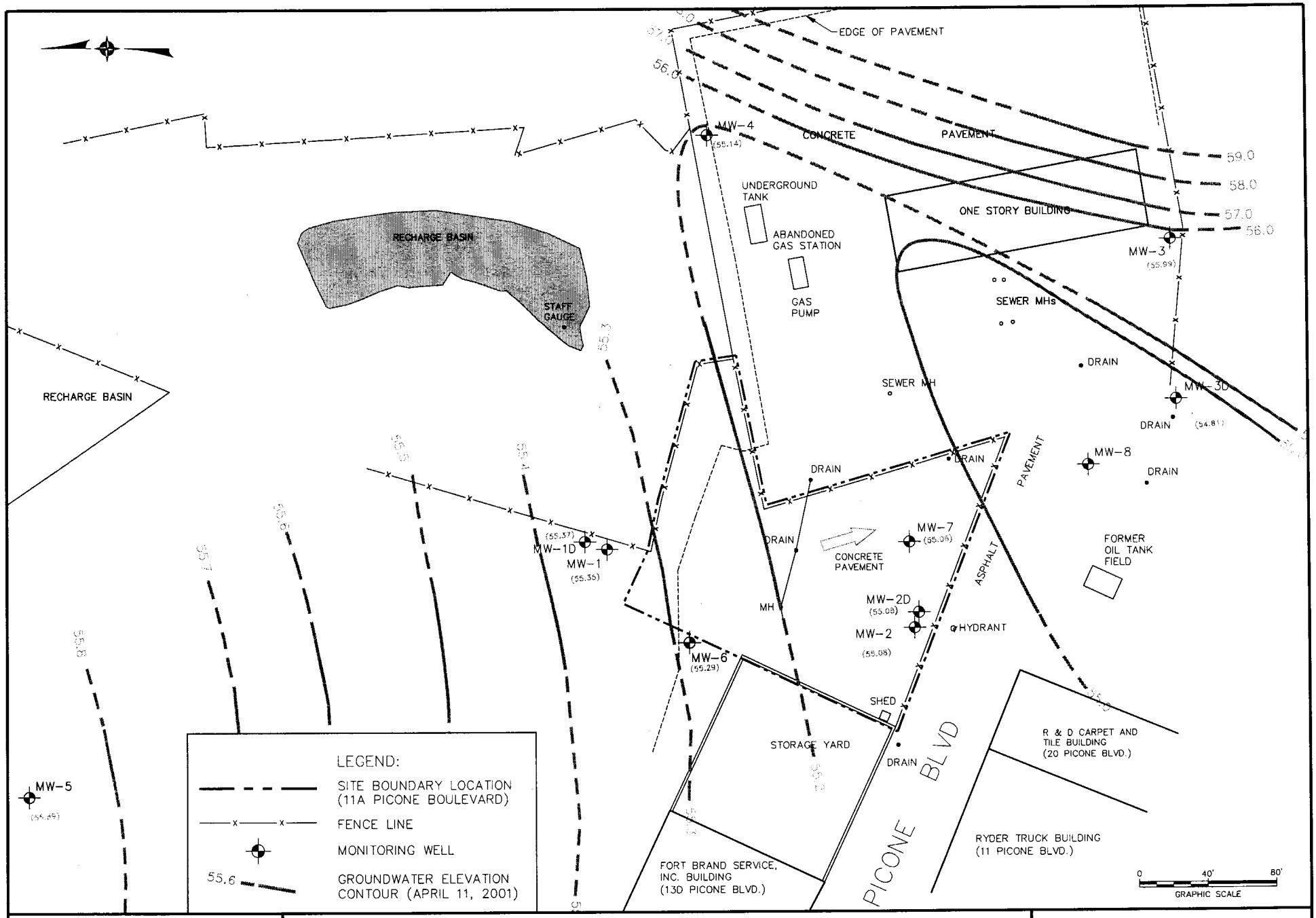
FIGURE 1



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SITE MAP

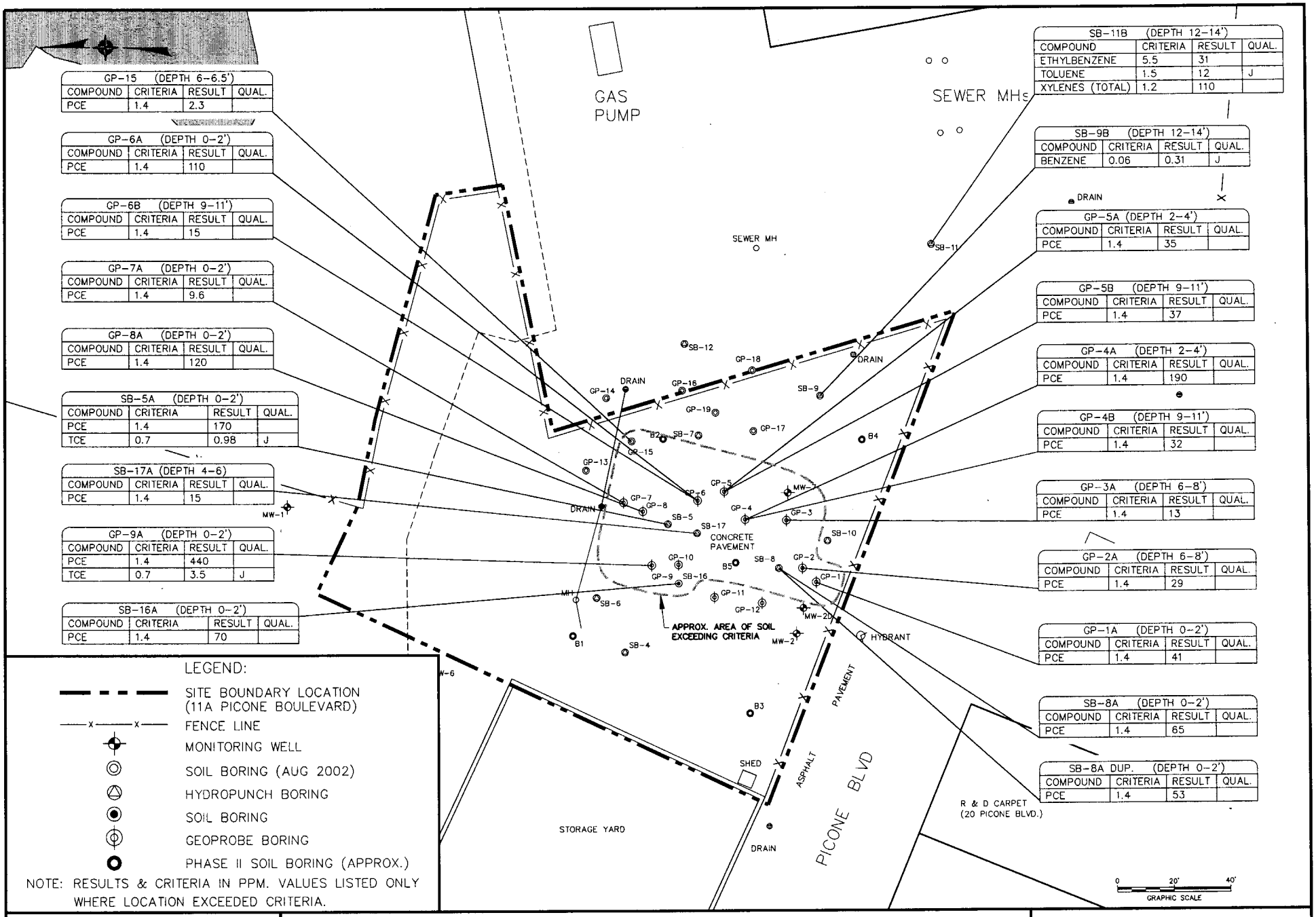
FIGURE 2



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

MONITORING WELLS & GROUNDWATER CONTOURS

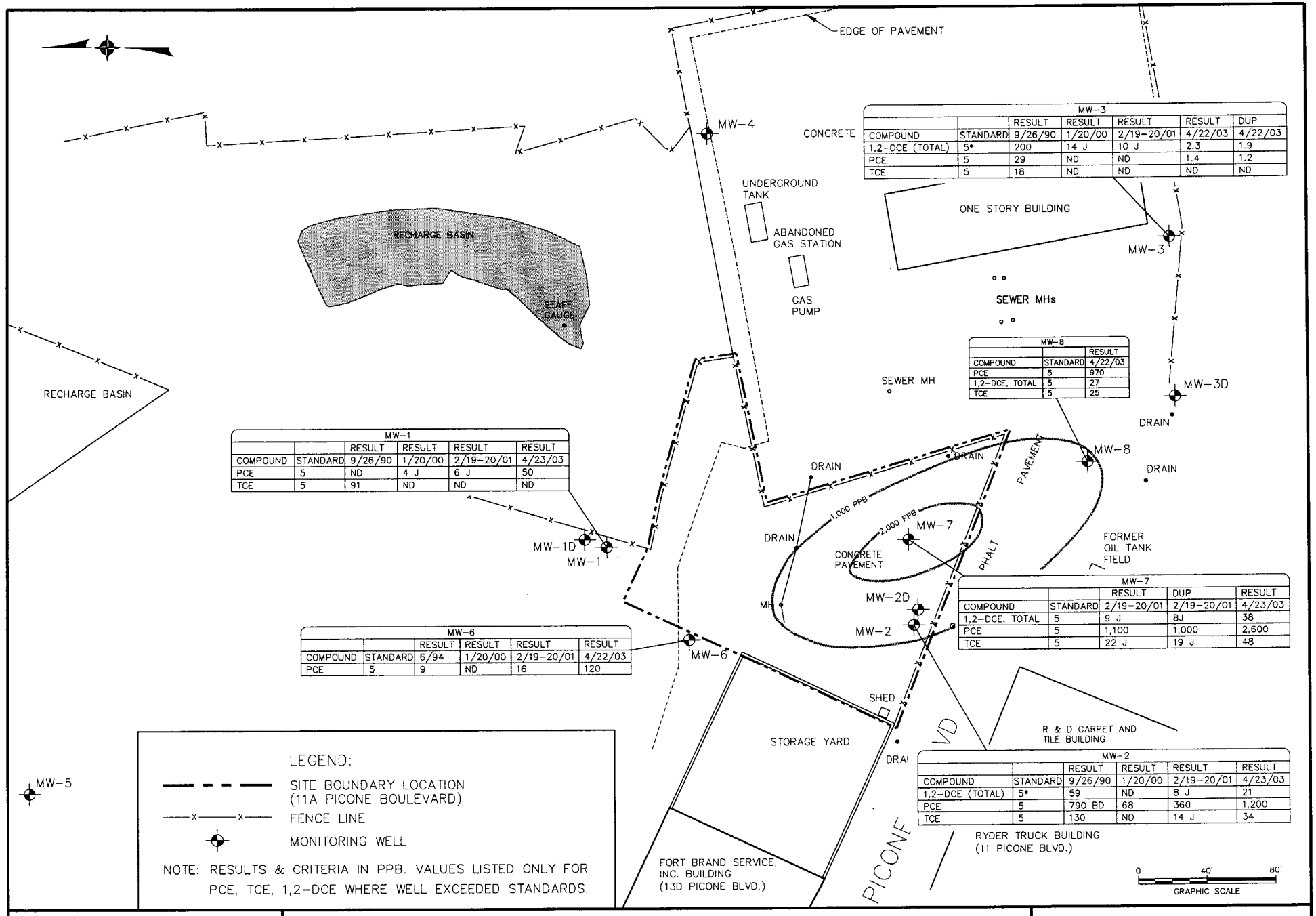
FIGURE 3



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SOIL SAMPLE LOCATIONS & VOC RESULTS

FIGURE 4



MW-3					
		RESULT	RESULT	RESULT	DUP
COMPOUND	STANDARD	9/26/90	1/20/00	2/19-20/01	4/22/03	4/22/03
1,2-DCE (TOTAL)	5*	200	14 J	10 J	2.3	1.9
PCE	5	29	ND	ND	1.4	1.2
TCE	5	18	ND	ND	ND	ND

MW-8		
		RESULT
COMPOUND	STANDARD	4/22/03
PCE	5	970
1,2-DCE, TOTAL	5	27
TCE	5	25

MW-1					
		RESULT	RESULT	RESULT	RESULT
COMPOUND	STANDARD	9/26/90	1/20/00	2/19-20/01	4/23/03
PCE	5	ND	4 J	6 J	50
TCE	5	91	ND	ND	ND

MW-7				
		RESULT	DUP	RESULT
COMPOUND	STANDARD	2/19-20/01	2/19-20/01	4/23/03
1,2-DCE, TOTAL	5	9 J	8J	38
PCE	5	1,100	1,000	2,600
TCE	5	22 J	19 J	48

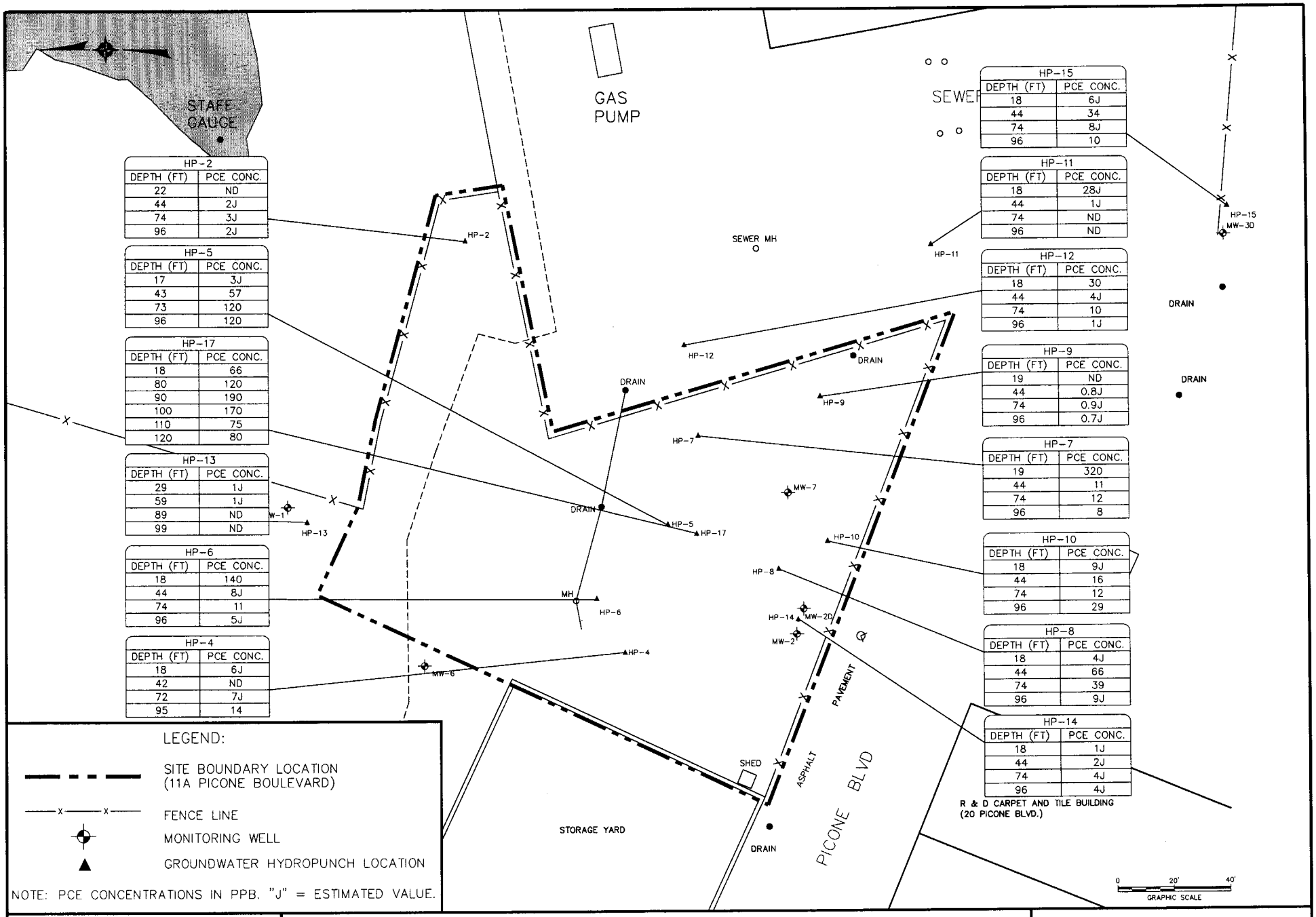
MW-6					
		RESULT	RESULT	RESULT	RESULT
COMPOUND	STANDARD	6/94	1/20/00	2/19-20/01	4/22/03
PCE	5	9	ND	16	120

MW-2					
		RESULT	RESULT	RESULT	RESULT
COMPOUND	STANDARD	9/26/90	1/20/00	2/19-20/01	4/23/03
1,2-DCE (TOTAL)	5*	59	ND	8 J	21
PCE	5	790 BD	68	360	1,200
TCE	5	130	ND	14 J	34

HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

MONITORING WELLS & VOC RESULTS

FIGURE 5



HP-2	
DEPTH (FT)	PCE CONC.
22	ND
44	2J
74	3J
96	2J

HP-5	
DEPTH (FT)	PCE CONC.
17	3J
43	57
73	120
96	120

HP-17	
DEPTH (FT)	PCE CONC.
18	66
80	120
90	190
100	170
110	75
120	80

HP-13	
DEPTH (FT)	PCE CONC.
29	1J
59	1J
89	ND
99	ND

HP-6	
DEPTH (FT)	PCE CONC.
18	140
44	8J
74	11
96	5J

HP-4	
DEPTH (FT)	PCE CONC.
18	6J
42	ND
72	7J
95	14

HP-15	
DEPTH (FT)	PCE CONC.
18	6J
44	34
74	8J
96	10

HP-11	
DEPTH (FT)	PCE CONC.
18	28J
44	1J
74	ND
96	ND

HP-12	
DEPTH (FT)	PCE CONC.
18	30
44	4J
74	10
96	1J

HP-9	
DEPTH (FT)	PCE CONC.
19	ND
44	0.8J
74	0.9J
96	0.7J

HP-7	
DEPTH (FT)	PCE CONC.
19	320
44	11
74	12
96	8

HP-10	
DEPTH (FT)	PCE CONC.
18	9J
44	16
74	12
96	29

HP-8	
DEPTH (FT)	PCE CONC.
18	4J
44	66
74	39
96	9J

HP-14	
DEPTH (FT)	PCE CONC.
18	1J
44	2J
74	4J
96	4J

LEGEND:

SITE BOUNDARY LOCATION (11A PICONE BOULEVARD)

FENCE LINE

MONITORING WELL

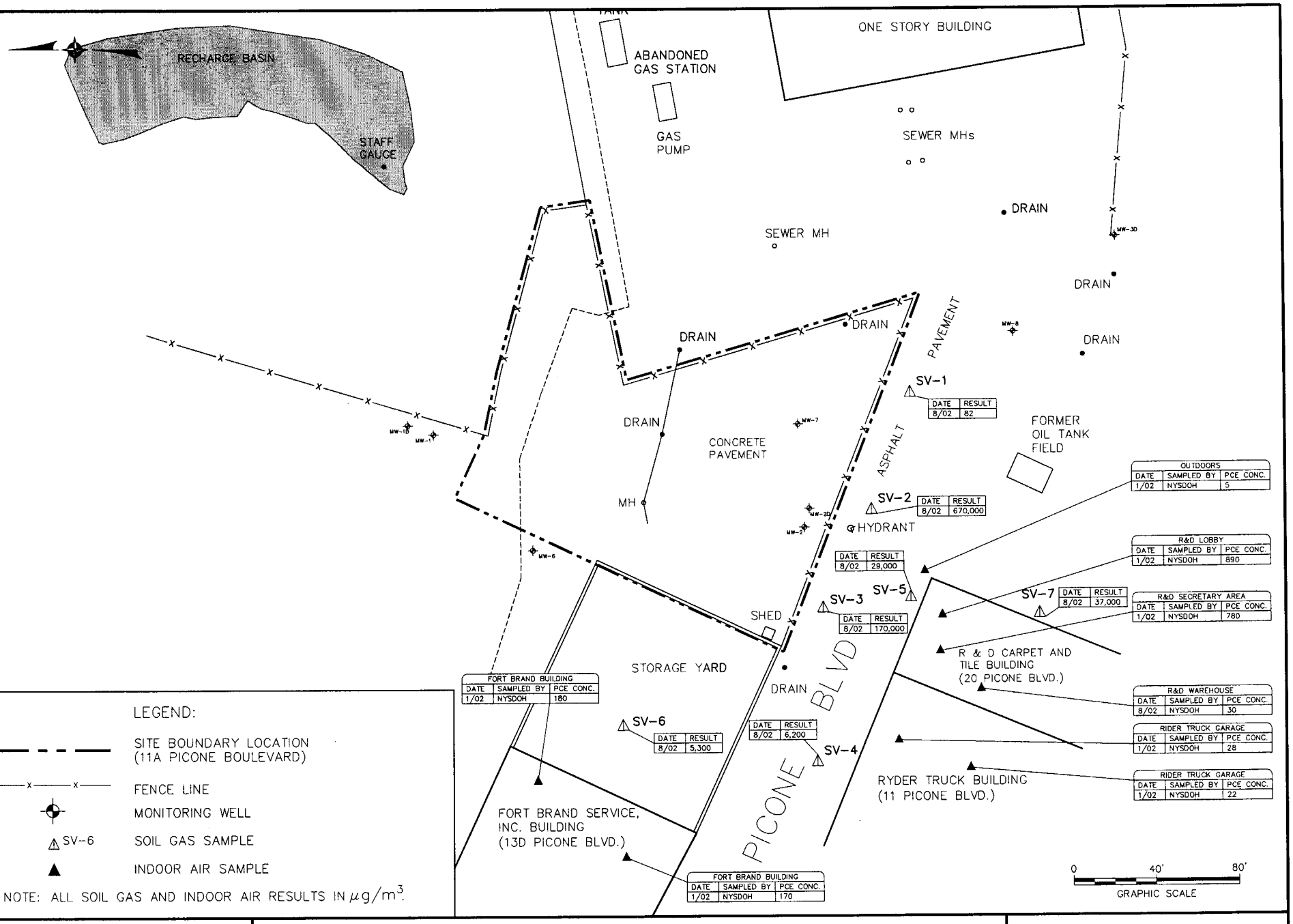
GROUNDWATER HYDROPUNCH LOCATION

NOTE: PCE CONCENTRATIONS IN PPB. "J" = ESTIMATED VALUE.

HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

GROUNDWATER HYDROPUNCH RESULTS

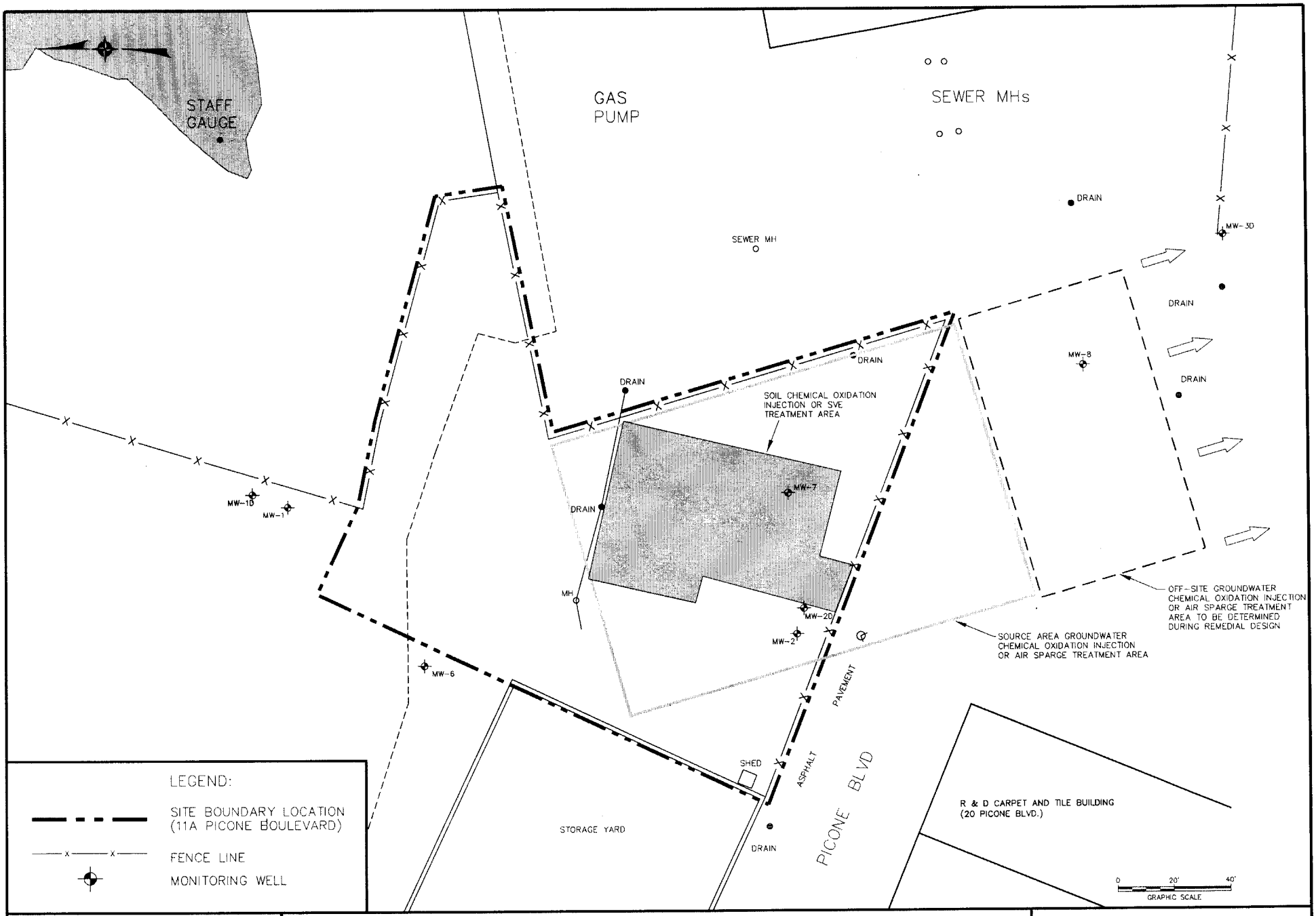
FIGURE 6



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SOIL GAS & INDOOR AIR RESULTS

FIGURE 7



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SELECTED REMEDY

FIGURE 8

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Hazardous Waste Disposal
Farmingdal, Nassau County, New York
Site No. 1-52-113

The Proposed Remedial Action Plan (PRAP) for the Hazardous Waste Disposal (HWD) Site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on September 14, 2004. The PRAP outlined the remedial measure proposed for the contaminated soil, soil gas and groundwater at the HWD site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on September 28, 2004, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on October 14, 2004.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

COMMENT 1: Is the R&D building located over contaminated soil or groundwater?

RESPONSE 1: Based on the data collected during the remedial investigation, the soil contamination found on the HWD Site does not extend off-site. However, contaminants from contaminated soils on-site have migrated off-site through the soil vapor and have been identified in the vicinity of the R&D building. It is unknown if contaminated groundwater is beneath the R&D building; the building may be beyond the western edge of the groundwater plume.

COMMENT 2: What is the maximum groundwater concentration?

RESPONSE 2: The maximum groundwater contamination found during the RI was 2,600 ppb of tetrachloroethene (PCE), detected in monitoring well MW-7 located on-site within the source area. The NYSDEC groundwater standard for this compound is 5 ppb.

COMMENT 3: Why are residential standards being used for air quality when R&D is a commercial facility?

RESPONSE 3: The New York State Department of Health (NYSDOH) ambient air guideline for PCE was originally developed to identify residential areas adjacent to dry cleaners that were impacted with PCE in the indoor air. During the course of site investigations, it became clear that other entities, (commercial businesses, administrative buildings) were also being affected with PCE impacts to indoor air. For those impacted buildings, which do not employ the use of PCE during the process of routine business, industrial standards for PCE do not apply. NYSDOH will continue to apply its PCE guideline in these instances.

COMMENT 4: How close are the two buildings (R&D and Ryder Truck)? How do you know the contamination is coming from the soil and not from the Rider Truck building?

RESPONSE 4: R&D and Ryder Truck are adjacent buildings sharing a common wall. An inspection, inventory, smoke testing and indoor air sampling was performed at Ryder Truck to determine if it could be a source of the problems at R&D. The testing did not indicate that Ryder Truck was a source. The indoor air sampling identified lower levels of PCE within Ryder Truck, 22-28 ug/l, vs. 780-890 ug/l in R&D (based on the initial January 2002 testing).

COMMENT 5: Was the PCE found in the R&D building in the whole building or just parts of the building?

RESPONSE 5: PCE was identified in the offices (secretary and lobby areas) and at lower detections in the warehouse area.

COMMENT 6: Will air sparging create more vapors that will expose people to contaminants?

RESPONSE 6: Air sparging injects air into the groundwater to volatilize contaminants out of the groundwater. A soil vapor extraction system installed above the air sparging injection wells would collect the generated vapor below the ground surface. The soil vapor extraction system would create a negative pressure below grade minimizing potential exposure of people to contaminants.

COMMENT 7: What are the PCE/TCE concentrations in groundwater?

RESPONSE 7: PCE concentrations in groundwater ranged from 0.8 ppb to 2,600 ppb and TCE ranged from 1 ppb to 48 ppb from wells screened at the water table. Deeper wells were non-detect.

COMMENT 8: What is the depth to groundwater?

RESPONSE 8: The depth to groundwater in the vicinity of the site is 10 feet to 13 feet below grade.

COMMENT 9: Is contaminated soil or contaminated groundwater the main source of exposure to people?

RESPONSE 9: Dermal contact with contaminated soil and ingestion of contaminated groundwater are both potential exposure pathways to people. Inhalation of vapors in indoor air from contaminated soil gas is considered a completed exposure pathway.

On behalf of the Hazardous Waste Disposal, Inc. Respondent Group (HWD Group), Frederick J. Kirschenheiter, P.E. of Blasland, Bouck & Lee, Inc. (BBL) submitted comments in a letter dated October 15, 2004. These comments are repeated below along with the NYSDEC responses.

COMMENT 10: As discussed below, revisions to the PRAP are technically appropriate. These comments are submitted for inclusion in the Administrative Record and should be addressed in the Responsiveness Summary portion of the Record of Decision (ROD). By way of background, the proposed remedy from the NYSDEC-approved Feasibility Study Report (BBL, July 2004) [herein after, "the FS Report"], in brief, is "Alternative 2" and consists of:

- in-situ chemical oxidation for treatment of soils at the HWD site to a performance goal of 10 part per million (ppm) total volatile organic compounds (VOCs), which is the VOC cap value presented in the NYSDEC document titled, "Determination of Soil Cleanup Objectives and Cleanup Levels," HWR-94-4046, dated January 24, 1994 (TAGM 4046);

- in-situ chemical oxidation treatment of groundwater beneath the HWD site to reduce VOC concentrations consistent with upgradient VOC levels that are from non-site related upgradient industrial sources;

- verification sampling and analysis activities to evaluate the reduction of VOCs in unsaturated soil;

- groundwater sampling and analysis activities to evaluate the reduction of VOC concentrations in groundwater;

- maintenance and repair of the concrete/pavement materials covering the majority of the HWD site;

- implementing use restrictions for site groundwater;

- implementing restrictions that limit property use to commercial/industrial (unless soil values for unrestricted use are achieved);

- implementing a periodic groundwater monitoring program; and

- operation, maintenance, and monitoring the active slab depressurization (ASD) system installed at the R&D Carpet and Tile (R&D) facility located across the street from the HWD site until source area soils at the HWD site are remediated or until the building is no longer occupied.

The PRAP issued by the NYSDEC selects the above-described Alternative 2 as an acceptable remedial action for soil and groundwater, but also identifies Alternative 4 (soil vapor extraction and groundwater air sparging) as an appropriate remedial action. The PRAP also selects Performance Standard 2 (soil treatment to TAGM-compound specific guidance values and groundwater remediation to upgradient VOC concentrations) as opposed to the performance standard recommended in the NYSDEC-approved FS Report, Performance Standard 1 (soil treatment to the 10 ppm cap value stated in TAGM 4046 and groundwater remediation to upgradient VOC concentrations). Further discussion of these differences and other issues identified based on our review of the PRAP is presented in the specific comments below. The comments also identify reasonable revisions to the PRAP (to be reflected in the ROD) that the HWD Group is requesting.

RESPONSE 10: Comment 10 represents the opening remarks of BBLs October 15, 2004 letter and has been included as a comment for purposes of clarification. The Feasibility Study does not actually present the proposed remedy; it presents an evaluation of remedial alternatives and, in this case, the HWD Group's recommended remedial alternative. The evaluation and recommendations in the FS are then considered by the NYSDEC and NYSDOH in development of the proposed remedy. Therefore, the bullet items listed in this comment do not necessarily represent the elements of the proposed remedy. For example, under Bullet No. 1, the primary contaminant of concern in the soil, soil vapor and groundwater is PCE. A remedial goal of 10 ppm for PCE in source area soils is not consistent with the remedial goal for PCE in soils found in TAGM 4046, which is 1.4 ppm. Bullet No. 2 only mentions on-site groundwater but the remedy includes remediation of both on-site and off-site groundwater. The upgradient groundwater goal will not be based on historic data and must be retested before system shutdown. Regarding Bullet No. 9, the remedy requires the operations, maintenance and monitoring activity for the ASD system conducted while the building is occupied. If the building should become vacant, maintenance and monitoring of the system will still be required, but indoor air monitoring will not be required. When the building is re-occupied, the indoor air will need to be re-sampled prior to reoccupation.

COMMENT 11: *Section 1: Summary and Purpose of the Proposed Plan, First Paragraph:*
NYSDEC's numerous references to "significant threats" allegedly posed by the HWD Site can present an inaccurate characterization of actual Site conditions because such references do not take into account the mitigating factors set forth below. Specifically:

- all hazardous wastes previously managed at the site were removed in 1984;
- the site has been and continues to be covered with concrete pavement that effectively serves as a barrier to direct contact with underlying soils exhibiting VOCs at concentrations above NYSDEC soil guidance values for unrestricted site use;
- the site is only about ½ acre in size and is currently being used as a truck/tractor-trailer parking lot;

- the site is located in a commercial/industrial area where there is ongoing off-site commercial use of materials containing VOCs, such as tetrachloroethene (PCE) and/or trichloroethene (TCE);

- there are no residential properties within a considerable distance of the site;

- materials containing PCE and TCE have been observed to be used at the nearby R&D facility (R&D), the Ryder Truck garage that adjoins the R&D building, and the nearby Fort Brand Service, Inc. facility;

- the area is serviced by a municipal water and sewer system;

- there are no identified users of groundwater for a source of potable water at or in the vicinity of the site; and

- abatement measures are already in place at the R&D facility to address potential sources of VOCs to indoor air, whether originating from sources inside the building or potentially from beneath the floor slab of the building. These measures include the upgraded heating, ventilation, and air conditioning (HVAC) system and recently-installed ASD system. Further, as previously discussed with the NYSDEC and confirmed by data, it cannot be conclusively determined that VOCs previously identified in indoor air at R&D are related to the HWD site, particularly where a can of PCE-containing parts cleaning product was previously identified in the garage of the R&D building during sampling activities in August 2003.

As such, the PRAP should be revised to reflect these highly relevant and important facts so that the "significant threat" language, which can be misunderstood by the public, is more appropriately placed within the context of the specific factual setting of the site and surrounding area. Further, the language in the PRAP should not be used to create an inaccurate impression of environmental or public health threats where actual abatement measures and physical conditions already substantially eliminate or mitigate any such threats.

RESPONSE 11: The ROD has been updated to include the mitigative measures conducted at the R&D facility after the PRAP was released, consisting of the installation, operation and maintenance of an ASD system. However, the PRAP and ROD take into account and specifically mention all the other site conditions and mitigating factors that are identified in this comment. In accordance with the determination of 'significant threat' found at 6 NYCRR Part 375-1.4, this site poses a significant threat. Further, 6 NYCRR Part 375-1.11(b) allows the Department to consider the situation prior to mitigative measures: *"If a responsible party of a site completes to the Department's satisfaction a Department-approved IRM, the Department and the Commissioner, in making, respectively, a later determination under section 375-1.8 of this Part whether the hazardous waste at the site constitutes a significant threat to the environment and the Commissioner's determination under section 375-2.1 of the Part of whether hazardous waste at a site constitutes a significant threat to the environment, may base their respective determinations upon facts and circumstances known to the Department to have existed at any time since the date upon which the site was first listed in the Registry that*

demonstrate the highest relative priority of the need for action at the site and may disregard any amelioration of conditions at the site accomplished by the IRM unless the IRM achieves the goal of a complete program as described in subdivision 375-1.10(b) of the Part." As long as the soil in this area continues as a source of groundwater and soil vapor contamination, the site will continue to be a significant threat. The language in Section 1 of the ROD has been modified slightly to clarify that the significant threat is associated with potential exposure to contaminated soils and current exposure to soil gas.

The NYSDEC and NYSDOH consider the indoor air problems at the R&D facility to be linked to the contamination at the HWD site. This conclusion is based on the high levels of PCE detected in the soil gas samples collected between the HWD site and the R&D Carpet and Tile building, and insufficient evidence of a source of PCE within the building. A single can of PCE-containing parts cleaner is not sufficient evidence of routine PCE use at this facility. BBL has identified in two inventory reports, one in the October 2, 2002 Soil Vapor Investigation Report, the other in the January 16, 2003 Air Handling System/Inventory Report that no PCE was identified as being used in the R&D Carpet and Tile building. Employee interviews by the NYSDEC and NYSDOH did not substantiate the use of PCE or PCE containing products within the facility.

COMMENT 12: *Sections 1, 5.1, 7, and 8:* Treatment of source area soils to non-promulgated soil guidance values presented in NYSDEC TAGM 4046 is not warranted considering the lack of additional environmental/ health benefits associated with meeting these guidance values and given the very substantial added costs. Treatment to the 10 ppm total VOC cap value stated in TAGM 4046 and recommended in the approved FS Report (as Performance Standard 1) is protective of human health and the environment and appropriately abates the presence of VOCs in soil.

First, there is no data that supports any completed exposure pathways associated with soils at the site. The site is covered with asphalt/concrete pavement (limiting direct human exposure to soil) and mitigation measures are already in place at R&D to address VOCs that may be detected in indoor air. Additionally, the HWD site will continue to be covered with concrete/asphalt pavement or a building and will be used only for commercial/industrial purposes. The protective surfaces will also be maintained and will minimize infiltration, thereby mitigating the potential for leaching of low VOC concentrations remaining following treatment.

Second, it is our understanding that the TAGM compound-specific guidance values the NYSDEC has selected allow for unrestricted use of a site. In this regard, it should be noted that such guidance documents are not "officially promulgated" environmental or health standards, nor are they consistently applied across the State. Moreover, the NYSDEC has advised the public that such TAGMs are not fixed rules and are to be applied only where specific facts and circumstances require the application of such guidance values to eliminate a significant threat to the environment. Given the site specific conditions described in Comment 1 above, the use of an "unrestricted use" TAGM value is without technical justification. The use of such soil guidance values are a matter of technical discretion based upon site specific facts, not statutorily mandated The simple adherence to a particular TAGM value, under the specific circumstances of this site, does not increase in any manner the long term, effective, risk management of the site.. In short,

the NYSDEC should not rely upon compound-specific guidance values given the site-specific circumstances at this site.

Further, the new NYS Superfund Refinancing and Reform Legislation signed into law by the Governor in October 2003: (1) allows contemplated use of a property as a relevant factor in determining appropriate cleanup values; and (2) requires the NYSDEC to develop separate soil cleanup objectives for commercial and industrial sites. Requiring soil cleanup at this site to the TAGM 4046 residential guidance values is inconsistent with the current state of the law and the views of the legislative and executive branches of the NYS government. Performance Standard 1 set forth in the Approved Feasibility Study (the 10 ppm cap value for total VOCs in soil) is protective, mitigates threats to the environment or public health, and meets the NYSDEC-approved remedial action objectives (RAOs).

It is the mitigation of potential threats and achievement of the NYSDEC-approved RAOs, not the mere attainment of a numerical value set forth in a non-promulgated guidance that must govern the ROD for the site. The additional costs for treating soil that meets the 10 ppm VOC cap to the TAGM 4046 soil guidance values are not technically justified because the RAOs in the approved FS Report and Remediation Goals in the PRAP can effectively be achieved under Performance Standard 1. In addition, as stated in the National Contingency Plan (NCP) under 40 CFR Part 300.430(f)(1)(ii)(D), remedial costs should be proportional to the overall effectiveness of the remedial efforts, and the significant additional costs to treat soil to a non-promulgated TAGM soil guidance value are not proportional to the modest change, if any, in effectiveness. Accordingly, under the facts and circumstances of this site, the use of a residential TAGM guidance value is inappropriate. Instead, Perfomance Standard 1 should be adopted as it is fully protective of public health and the environment, will achieve the Remedial Action Objectives, and is consistent with the NCP.

RESPONSE 12: Attainment of the TAGM value (soil cleanup objective) for PCE is considered to be a necessary and feasible level of protection for this site, based on a site specific evaluation of the remedy selection criteria. Although the existing asphalt cover limits human exposure to contaminated soil, it has not been effective in reducing impacts from the source area to soil gas and groundwater under the site. Achieving the TAGM PCE value will provide for greater reduction in soil gas impacts and the contaminant loading to the aquifer. The TAGM sets a total VOC soil cleanup objective of 10 ppm, which typically applies to sites with many different VOCs or to VOCs without any individual soil cleanup objective. For the HWD site, PCE is the predominant compound, therefore the individual compound-specific criteria applies. Although the new NYS Superfund/Brownfield Law explicitly allows for separate cleanup objectives for commercial and industrial facilities, these cleanup objectives only apply to the Brownfield Cleanup Program, and they have not yet been developed.

Based on the site-specific conditions and remedial technologies applicable to this site, the TAGM PCE value is considered to be feasible from a cost standpoint. The estimated increase in remedial costs to achieve 1.4 ppm PCE in soil vs. 10 ppm PCE in soil are approximately 17 percent. The NYSDEC believes that this additional cost is proportional to the overall effectiveness of the remedy for the reasons stated here. In addition, achievement of the TAGM PCE value would be considered a permanent remedy and would eliminate the need for the added

long-term costs to monitor and maintain engineering and institutional controls that would be required otherwise. As stated in the ROD, if during the operation of the remedial action the NYSDEC determines that it is technically impractical or infeasible to achieve the remedial objectives, alternative objectives will be considered.

COMMENT 13: *Sections 1 and 8:* The NYSDEC proposes that soil and groundwater treatment by in-situ chemical oxidation (Alternative 2) is appropriate for the Site, but then also proposes that soil treatment by soil vapor extraction (SVE) and groundwater treatment by air sparging (Alternative 4) is an appropriate alternative. The selection of two remedial alternatives to treat soils and groundwater at the HWD site is unnecessary. Based on the data developed in the Remedial Investigation (RI) and based upon BBL's understanding of site conditions, implementation of the alternative recommended in the NYSDEC-approved FS Report (i.e., in-situ chemical oxidation treatment for soil and groundwater) will result in attainment of the two performance standards presented in the report. An alternative remedy is unnecessary because the recommended alternative in the NYSDEC-approved FS Report (PRAP Alternative 2):

- has the ability to meet remedial action objectives and remedial performance goals;

- can be implemented quicker than the other alternatives in that it does not involve long-term operation and maintenance;

- effectively mitigates threats to the environment and public health; offers an economy of scale by using one technology to treat soil/soil gas and groundwater; involves handling of less impacted material, which is inherently safer for remedial site workers; and is cost-effective. The PRAP and ROD should be clear that the remedy proposed in the approved FS Report, in-situ chemical oxidation for soil and groundwater, is an acceptable remedy for the site. An alternative to in-site chemical oxidation for soil and groundwater is therefore unnecessary.

RESPONSE 13: The successful use of chemical oxidation for treatment of unsaturated soils has not been sufficiently demonstrated, therefore, its effectiveness is uncertain. The shallow soil contamination (1-2 feet below grade) and high permeability sands and gravels on this site could make it difficult to achieve the retention time required for the chemical reaction to be effective. SVE and groundwater air sparging are included as an alternative remedy because they are proven technologies for sites with similar geology and VOC contaminant concentrations. SVE and groundwater air sparging provide for flexibility in the remedial approach and an alternative in the event chemical oxidation does not prove to be effective.

COMMENT 14: *Section 1: Summary and Purpose of the Proposed Plan, 7th Bullet on Page 1 and Section 8: Summary of the Proposed Remedy, #5 on Page 15:* Given the small size of the site, the relative abundance of existing physical/chemical soil and groundwater data, and planned pre-design activities, there is no technical need for a pilot study to further evaluate the chemical oxidation alternative, and it should not be required in the ROD. Delivery systems and oxidant dosing can reasonably be determined during design based on the combination of existing data and new data to be generated during pre-design. Results of treatment system performance

monitoring in connection with the initial oxidant injection event can be used to determine the need for additional injections to accomplish cleanup objectives.

RESPONSE 14: The purpose of the pilot testing was to determine if chemical oxidation can adequately treat contamination in source area soils at this site given the limited demonstration of success on other sites (see Response 13, above). Given the relatively small size of the site, we agree that performance monitoring during oxidant injection events can be used to determine its effectiveness. Therefore, the pilot test has been eliminated from the ROD. However, the oxidant injections must be carefully monitored to determine the effectiveness in remediating the site (particularly the vadose zone soils where the effectiveness of this technique has not been well demonstrated) and to determine the need for additional injections. If oxidant injection is not effective, as shown through monitoring, then the alternate remedy of SVE and air sparging as specified within the ROD, will be implemented. The monitoring will require baseline sampling, periodic monitoring during implementation and post remedial monitoring of VOCs in soil and groundwater.

COMMENT 15: *Section 1: Summary and Purpose of the Proposed Plan, 2nd Bullet on Page 2 and Section 8: Summary of the Proposed Remedy, #7 on Page 15:* The NYSDEC indicates that installation, operation, maintenance, and monitoring of vapor intrusion controls is needed to reduce PCE concentrations in indoor air at the nearby R&D facility to ambient background levels. The ROD should acknowledge that such additional measures, as requested by the NYSDEC (ASD system), were completed during the week of September 20, 2004. The fact that abatement measures have already been implemented should be noted in the PRAP and ROD.

Further, it is often not possible to consistently achieve ambient background using reasonable means, particularly in an industrial zone and inside a commercial/industrial building. As such, it is inappropriate to rely upon ambient background detections. The ambient levels should not be required in the ROD. Further, to the extent that the ROD seeks to establish indoor air concentrations or regulate indoor air conditions for workers in the commercial/industrial workplace, the NYSDEC has inappropriately intruded into areas regulated under the jurisdiction of the Occupational Safety and Health Act. The ROD should not mandate activities or conditions that go beyond the jurisdiction of the NYSDEC and New York State Department of Health (NYSDOH).

In addition, based on conversations with the NYSDOH, it is our understanding that the NYSDOH requests and concerns would be addressed at R&D provided PCE concentrations are reduced following the ASD system installation and confirmation that the system is operational. The ROD should reflect that the ASD system has already been installed and is operational. The purpose of the ASD system is to provide a negative pressure beneath the building floor slab thereby abating the migration of VOC vapors into the building.

RESPONSE 15: Text has been updated in the ROD to acknowledge that the ASD system was installed and is operational, and the selected remedy now requires the continued operation, maintenance and monitoring of this system. Sections 5.2 and 5.3 of the ROD clarify that the ASD system provides a negative pressure beneath the building floor slab thereby abating the migration of VOC vapors into the building. Ambient (outdoor) air levels are the treatment goal

for the indoor air levels. Indoor air levels are not expected to be able to achieve concentrations lower than that of outside air. We do not consider the problems at the R&D facility to be an OSHA-regulated situation as the R&D facility does not routinely use PCE (see Response 11, above). Therefore, this exposure is being mitigated in connection with contaminant migration from the HWD Site.

COMMENT 16: *Section 1: Summary and Purpose of the Proposed Plan, 3rd Bullet on Page 2 and Section 8: Summary of the Proposed Remedy, #8 on Page 15:* The NYSDEC indicates that a Site Management Plan would be included as part of the remedy. This bullet and the ROD should also indicate that the plan would no longer be needed if VOC constituent concentrations in soil are reduced to unrestricted use levels.

RESPONSE 16: As suggested, the ROD indicates that, once soil concentrations are treated to unrestricted use levels and groundwater is treated to either unrestricted use levels or to upgradient concentrations, the site management plan would no longer be needed.

COMMENT 17: *Section 1: Summary and Purpose of the Proposed Plan, 4th Bullet on Page 2 and Section 8: Summary of the Proposed Remedy, #9 on Page 15:* The NYSDEC references unrestricted use levels for soil gas. BBL and the HWD Group are not aware of any existing NYS cleanup levels for soil gas. Please identify these cleanup levels, reference the source from which they were taken, and the statutory provision that mandates the use of such a cleanup level. If such unrestricted use levels for soil gas have not been promulgated, this provision should be removed.

RESPONSE 17: There are no promulgated standards for soil gas. The reference to soil gas has been removed from these items in the ROD.

COMMENT 18: *Section 1: Summary and Purpose of the Proposed Plan, 5th Bullet on Page 2 and Section 8: Summary of the Proposed Remedy, #10 on Page 15:* The NYSDEC indicates that an annual certification would be required as part of the remedy. The PRAP implies that annual certification would be needed until "groundwater concentrations are treated to unrestricted use levels", which is different from the proposed elements of the remedy that require "treatment of on-site and off-site groundwater to reduce total VOC concentrations to upgradient concentrations". (Section 8, [3]). It is arbitrary and capricious to require annual certifications when the only remaining issue at the site, following remediation, would be VOC groundwater concentrations above standards originating solely from upgradient sources. In other words, the ROD should reflect that there is an upgradient groundwater contaminant condition that migrates onto the Site and that there is also a pre-existing downgradient groundwater contaminant condition unrelated to the HWD Site. The language in the PRAP needs to be clarified to address the specific circumstances of this Site.

In addition, a licensed professional engineer could not reasonably be required to certify that "the institutional and engineering controls in place, are *unchanged* from the previous certification and *nothing has occurred* that would impair the ability of the control to protect public health or the environment…" [emphasis added in italics] without being on site continuously to observe the engineering controls and document potential changes to conditions. The circumstances and costs

associated with providing the type of certification statement described in the PRAP is unreasonable and impracticable. The provision for a certification statement should either be removed or the language substantially modified to allow a licensed professional engineer to certify that, to the best of their knowledge, the remedial components are operating as intended and in accordance with the ROD and the approved design.

RESPONSE 18: The language has been modified in the ROD indicating that removal of the annual certification would be considered if soil is treated to unrestricted use levels and groundwater is treated to either unrestricted use levels or to upgradient concentrations. The language has been modified in the ROD allowing a licensed professional engineer or such other expert acceptable to the NYSDEC to submit the annual certification.

COMMENT 19: *Section 1: Summary and Purpose of the Proposed Plan, 6th Bullet on Page 2 and Section 8: Summary of the Proposed Remedy, #11 on Page 15:* The NYSDEC indicates that "operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible." This section should be revised to reflect that the consultants and engineers involved in the implementation of the remedial action, along with any PRPs who might enter into an Order on Consent to implement the remedial action, would be involved in any determination of whether continued operation of the components of remedy is impracticable or not feasible. The language should also reflect that continued operation would only be required to eliminate an existing significant threat to the environment. In other words, the statutory requirement to eliminate or control the significant threats, if any, along with the applicable regulatory standards and the NCP, would govern any determination as to whether to continue the system.

RESPONSE 19: The NYSDEC and NYSDOH will work with the consultants, engineers and PRPs in the determination of whether continued operation of the components of the remedy is impracticable or infeasible, however, the NYSDEC and NYSDOH has the final approval for discontinuing the operation of remedial components. The remedial goals are established to eliminate the significant threats posed by the site. Therefore we do not consider it appropriate to modify the language in the ROD.

COMMENT 20: *Section 3.2: Remedial History:* Please change this section heading to "Regulatory History" to be more consistent with the contents of the section.

RESPONSE 20: The section heading has remained as is to be consistent with the NYSDEC's generic ROD format. This section represents the history of events between the time period when the site was fist listed in the NYSDEC's Registry to the period just prior to the start of the RI/FS, all of which fall under the NYSDEC's remedial program.

COMMENT 21: *Section 4: Enforcement Status:* For clarification, the existing Consent Order between the NYSDEC and HWD Group (Index No. W1-0728-95-05) requires activities through completion of the FS but does not cover actual remedial action. A new Order on Consent will need to be negotiated to govern the implementation of the remedial action set forth in the ROD.

RESPONSE 21: The information in this comment is correct, but the language in the ROD has not been modified as it is generally consistent with this comment and is consistent with the NYSDEC's ROD language.

COMMENT 22: *Section 5.1: Summary of Remedial Investigation, 2nd group of bullets, 3rd bullet:* Please change bullet to state, "Completion of a soil gas survey and evaluation of possible vapor exposure pathways." Please note that the purpose of the soil gas survey was not to locate VOC-impacted soils, as indicated by the text of the current bullet. The VOC-impacted soil delineation was completed by limited additional soil sampling in the eastern portion of the property as part of the supplemental RI.

RESPONSE 22: The language has been modified in the ROD as suggested.

COMMENT 23: *Section 5.1.3: Extent of Contamination, Air, Page 7:* The first paragraph of the air discussion identified a NYSDOH ambient air guideline of 100 micrograms per cubic meter ($\mu g/m^3$). According to the NYSDOH's fact sheet titled "Tetrachloroethene in Indoor and Outdoor Air" (available at www.health. state.ny.us/nysdoh/environ/btsa/fs_perc.htm) and as indicated in footnote "c" to Table 1 of the PRAP, the 100 $\mu g/m^3$ value was developed for a residential community and was based on continuous lifetime exposure assumptions (i.e., 24 hours per day, 365 days per year, for a lifetime). The assumptions that were used to develop the guideline are not appropriate for commercial/industrial workplaces. Moreover, the NYSDOH document even makes clear that: "the guideline is lower than the air levels that caused either non-cancer or cancer effects; thus the possibility of health effects is low even at air levels slightly above the guideline." The use of this residential guideline is inappropriate, is not applicable to this Site, and the PRAP and ROD should be revised accordingly.

As previously discussed, there is disagreement with the NYSDEC's statement that there is "insufficient evidence of a use of PCE within this building." The NYSDEC statement is wrong. As indicated in the approved FS Report, during an August 2003 site visit, trained consultants from BBL observed a can of PCE-containing parts cleaning product in the R&D facility. An employee subsequently interviewed by BBL verified the use of the PCE-containing parts cleaning product at the facility. Also, a considerable number of cans containing TCE were observed in storage in a wooden flammables cabinet in the back of the R&D garage area. These facts should not be ignored.

RESPONSE 23: The NYSDOH ambient air guideline for tetrachloroethene (PCE) was originally developed to identify residential areas adjacent to dry cleaners that were impacted with PCE in the indoor air. During the course of site investigations, it became clear that other entities, (commercial businesses, administrative buildings) were also being affected with PCE impacts to indoor air. For those impacted buildings which do not employ the use of PCE during the process of routine business, OSHA, Industrial Standards do not apply. NYSDOH will continue to use its PCE Guideline in these instances. The R&D facility is considered to be one of these instances since the facility does not routinely use PCE on the premises. The employees have indicated that the chemical products stored in the warehouse are only used off the premises. Therefore, the indoor air problems related to PCE are considered to be related to the HWD site and not from products stored at the facility. This is verified by the indoor air data as the PCE

detections were highest in the office areas, which are nearer to the HWD site and higher soil gas detections, and not in the warehouse where chemicals are stored. Also see the response to Comment 11, above.

COMMENT 24: *Section 5.2: Interim Remedial Measures:* The mitigative measures identified in the paragraph above this section (placement of temporary carbon air purifiers, and modifications to the building's HVAC system), which were interim actions taken to reduce the PCE concentrations in indoor air at R&D, should be acknowledged in this section. Additionally, please note that indoor air sampling data indicates that the HVAC system upgrades were effective when occupants inside the building did not shut off the system fan. Continuous fan operation was necessary to meet the intent of the design to provide outside air to ventilate the office space and provide positive pressure. An additional measure to address indoor air, the recently-installed ASD system, is online to further address indoor air conditions. These abatement measures should be fully discussed in the document.

RESPONSE 24: As suggested, the placement of temporary carbon air purifiers, the HVAC modifications, and the ASD system installation are now discussed in Section 5.2 of the ROD, Interim Remedial Measures.

COMMENT 25: *Section 5.3: Summary of Human Exposure Pathways, 5th full paragraph, last sentence:* The PRAP indicates that "none of the measures taken have consistently reduced the PCE indoor air levels below the NYSDOH ambient air guideline." First, this statement should now be modified in light of the sub-slab depressurization system. Second, based on available data, although there were a few instances when results following installation of the HVAC system upgrades were above guidelines (during cold weather months), the presence of PCE at such concentrations was more likely attributable to the HVAC system fan being shut off, despite the installation of a locking cover and discussions with persons using the building requesting that the fan run continuously. The HVAC system upgrades effectively reduced indoor air concentrations of PCE as long as the fan was allowed to run continuously. Without this clarification, the language in the PRAP is misleading. Results for all air monitoring performed at the site by BBL are presented in the attached table for reference.

RESPONSE 25: Section 5.2 of the ROD has been updated to include the ASD system which was installed after the PRAP was released. The HVAC system and system fan upgrades were not reliable and, therefore, were not considered to be effective in consistently reducing the PCE levels in the indoor air.

COMMENT 26: *Section 5.3: Summary of Human Exposure Pathways, 6th full paragraph, 2 sentence:* The PRAP indicates that "Site groundwater is not used for drinking, but groundwater could be used in the future since there are no restrictions in place to prevent its use." This statement is not fully accurate because groundwater use restrictions are already in place under Suffolk County Sanitary Code, Article 4 – Water Supply, Section 406.4, which essentially prohibit installation and use of new private wells without prior water testing and health department approval. Please revise this statement to reflect the existing restrictions on groundwater use. Reference to the Suffolk County Code should be referenced to insure complete accuracy of the PRAP.

RESPONSE 26: Although the restrictions on groundwater use exist, Suffolk County Department of Health Services (SCDHS) has no ability to inspect every property to prevent the installation of unpermitted wells. In addition, production, irrigation and cooling wells are not regulated by SCDHS, only private/public drinking water wells. While production, irrigation and cooling wells are not used for drinking water purposes, exposures to contaminated groundwater could still occur, if they were installed within the area of contaminated groundwater.

COMMENT 27: *Section 6 – Summary of the Remediation Goals, 1st set of bullets:* The NYSDEC remediation goals are different from the RAOs presented in Subsection 3.3 of the NYSDEC-approved FS Report. In addition, the stated goal in Section 6 of the PRAP to eliminate or reduce to the extent practicable "off-site migration of groundwater that does not attain groundwater quality standards" is infeasible and unrealistic because upgradient and downgradient groundwater contains VOCs at concentrations above groundwater quality standards due to sources not associated with the Site. In addition, this goal is inconsistent with the requirement established on the first page of the PRAP (2nd bullet in 2nd column on Page 1) that: "Treatment of on-site and off-site groundwater to reduce total VOC concentrations to *upgradient concentrations* …" [emphasis added in italics]. Please revise Section 6 to be consistent with the first page of the PRAP, and to address the other items described above.

RESPONSE 27: The NYSDEC has not made changes to the ROD in connection with this comment. The first five goals in Section 6 of the ROD are generally consistent with the RAOs presented in the Feasibility Study. Two additional remediation goals are stated in this section (i.e., attaining to the extent practicable: ambient groundwater quality standards, and SCGs for soils) which present general remedial program goals. Both of these goals are considered to be achievable, if not for the upgradient concentrations exceeding groundwater standards. The selected remedy has acknowledged that upgradient groundwater has been above standards in the past by limiting the groundwater treatment to upgradient groundwater concentrations. Upgradient groundwater concentrations will have to be retested during the site remediation to determine the final groundwater treatment limits. The groundwater remediation goal is independent of any downgradient groundwater contamination not related to this site.

COMMENT 28: *Section 6 – Summary of the Remediation Goals, 2nd set of bullets:* The statement that the remediation goals for the site include attaining to the extent practicable "ambient groundwater quality standards" is inconsistent with the first page of the PRAP (2nd bullet in 2nd column on Page 1) for the reasons stated above, under Comment 17. The statement also ignores that both upgradient and downgradient groundwater quality are impaired because of conditions entirely unrelated to the site. This site-specific reality must not be ignored. Please revise Section 6 of the PRAP accordingly.

RESPONSE 28: See response to comment 27, above. Although the groundwater remediation goal is to achieve groundwater standards, the ROD has limited the specific treatment goal for the selected remedy to upgradient groundwater concentrations due to the detections in upgradient wells.

COMMENT 29: *Section 7.1: Description of Remedial Alternatives (1st paragraph under Alternative 2):* This section should also indicate that Alternative 2 "involves an irreversible

process in which target VOCs would react completely with oxidant to produce carbon dioxide and innocuous substances found in nature. As this treatment takes place below the ground surface, VOCs are not intentionally extracted and handled or transferred to another media."

RESPONSE 29: The text in Section 7.1 of the ROD has been modified to indicate that Alternative 2 "involves an irreversible process in which target VOCs would react with oxidant to produce innocuous substances such as carbon dioxide, water, and inorganic chloride. Reactant intermediates may also occur. As this treatment takes place below the ground surface, VOCs are not intentionally extracted and handled or transferred to another media." Incomplete or intermediate reactions may occur, therefore it will be necessary to monitor the remediation to insure that the reaction is occurring as designed.

COMMENT 30: *Section 8: Summary of the Proposed Remedy, 3rd Paragraph on Page 14 [Also see Comment 4]:* This section indicates that "pilot testing would be required to determine if this technology would be effective in treating the unsaturated soils at this site." This is not accurate. As indicated in the NYSDEC-approved FS Report, pre-design activities will be performed to further evaluate oxidant demand, potential infiltration/oxidant injection rates, offgas generation, potential impacts on the biogeochemical environment, and the potential permeability reduction by manganese dioxide colloids. Based on the data to be generated by pre-design activities, and considering the small size of the site, additional pilot testing is neither technically justified nor scientifically warranted.

RESPONSE 30: As suggested, the pilot test has been removed from the selected remedy in the ROD. See responses to Comments 13 and 14 above.

APPENDIX B

Administrative Record

Administrative Record

Hazardous Waste Disposal Site
Site No. 1-52-113

1. Proposed Remedial Action Plan for the Hazardous Waste Disposal Site, dated September 2004, prepared by the NYSDEC.

2. Order on Consent, Index No. W1-0728-95-05, between NYSDEC and the Hazardous Waste Disoposal, Inc. respondents, executed in August 1999.

3. "Remedial Investigation/Feasibility Study Work Plan, Hazardous Waste Disposal, Inc. Site, Farmingdale, New York", February 1997, prepared by BBL, Inc.

4. "Remedial Investigation Report - Volume I, Hazardous Waste Disposal, Inc., Farmingdale, New York", May 2002, prepared by BBL, Inc.

5. "Remedial Investigation Report - Volume II, Hazardous Waste Disposal, Inc., Farmingdale, New York", May 2002, prepared by BBL, Inc.

6. "Remedial Investigation Report - Volume III, Hazardous Waste Disposal, Inc., Farmingdale, New York", May 2002, prepared by BBL, Inc.

7. "Feasibility Study Report, Hazardous Waste Disposal, Inc., Farmingdale, New York", July 2004, prepared by BBL, Inc.

8. Letter dated July 23, 2004 from David A. Camp, P.E. of the NYSDEC (FS approval).

9. Letter dated August 6, 2004 from David R. Gerber, P.E. of BBL, Inc. (ASD system IRM Work Plan).

10. Letter dated September 2, 2004 from David R. Gerber, P.E. of BBL, Inc. (Revisions to ASD system IRM Work Plan).

11. Letter dated October 15, 2004 from Frederick J. Kirschenheiter, P.E. of BBL, Inc. (PRAP comments).