PROPOSED REMEDIAL ACTION PLAN
Hazardous Waste Disposal
Farmingdale, Suffolk County, New York
Site No. 1-52-113

September 2004

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

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SECTION 1: <u>SUMMARY AND PURPOSE OF THE PROPOSED PLAN</u>

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing 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 proposed 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 volatile organic compounds (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 current and potential exposure to contaminated soils and 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 proposes the following remedy:

- A remedial design program would 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 (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 soil vapor extraction (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.
- A pilot study to evaluate the effectiveness and design parameters of chemical oxidation applied to source area soils.

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

- Installation, operation, maintenance and monitoring of vapor intrusion controls to reduce tetrachloroethene (PCE) concentrations in indoor air at the nearby R&D Carpet and Tile building to ambient background levels.

- A site management plan would be developed to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would 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 would (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. Once soil, soil gas and groundwater concentrations are treated to unrestricted use levels, the appropriate institutional controls could be removed.

- The property owner would provide an annual certification, prepared and submitted by a professional engineer or environmental professional acceptable to the NYSDEC, which would certify that the institutional controls 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 or constitute a violation or failure to comply with any operation and maintenance or site management.

- The 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.

The proposed 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.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the May 2002 "Remedial Investigation (RI) Report", the July 2004 "Feasibility Study (FS) Report", and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Farmingdale Public Library
116 Merritts Road
Farmingdale, New York
Phone: (516) 249-9090
Hours: M, T, Th 9:00 am - 9:00 pm
Wed 10:00 am - 9:00 pm
Fri 9:00 am - 6:00 pm
Sat 9:00 am - 5:00 pm
Sun 1:00 pm - 5:00 pm

NYSDEC - Region 1 Office
NYS SUNY, Building 40
Stony Brook, New York 11790-2356
Contact: Bill Fonda
Phone: (631) 444-0350
Hours: Mon-Fri 8:30 am - 5:00 pm

NYSDEC
625 Broadway
Albany, New York 12233-7016
Contact: David Camp, Project Manager
Phone: (518) 402-9768
Hours: Mon-Fri 8:30 am - 5:00 pm

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from September 14, 2004 to October 14, 2004 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for September 28, 2004 at the Farmingdale Public Library beginning at 7:00 pm.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. Camp at the above address through October 14, 2004.

The NYSDEC may modify the preferred alternative or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the NYSDEC's final selection of the remedy for this site.

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 wastes 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 in August 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;

- Soil gas survey to locate VOC contaminated soils and 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 µg/m^3 in sample SV-1 to 670,000 µg/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 could impact 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 µg/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 µg/m^3 and 780 µg/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.

Therefore, mitigative measures were taken to reduce the PCE concentrations consisting of the placement of temporary carbon air purifiers within this building, followed by modifications to the building's HVAC system. Once the HVAC modifications were complete, PCE concentrations were reduced, initially to below 5 µg/m^3; however, sampling conducted in December 2003 by the NYSDOH identified 140 µg/m^3 and 160 µg/m^3 in the secretary and lobby areas, respectively, indicating that the HVAC system was not consistently reducing PCE levels.

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. There were no IRMs performed at this site during the RI/FS.

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 none of the measures taken have consistently reduced the PCE indoor air levels below the NYSDOH ambient air guideline.

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: <u>SUMMARY OF THE REMEDIATION GOALS</u>

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: <u>SUMMARY OF THE EVALUATION OF ALTERNATIVES</u>

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: <u>Description of Remedial Alternatives</u>

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 the subsurface introduction of oxidizing agents, such as potassium permanganate, to degrade organic constituents present in soil or groundwater to less toxic byproducts. This alternative would use *in situ* chemical oxidation 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 installation, operation, maintenance and monitoring of vapor intrusion controls at the 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 installation, operation, maintenance and monitoring of the vapor intrusion controls and 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 installation, operation, maintenance and monitoring of the vapor intrusion controls and 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.

Aternative 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. This alternative would also include the installation, operation, maintenance and monitoring of the vapor intrusion controls and 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 installation, operation, maintenance and monitoring of the vapor intrusion controls and 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 are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing 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. The elements of this remedy are described at the end of this section.

The proposed 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 is being proposed 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 would 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 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 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 of unsaturated soils under Alternative 2. Although chemical oxidation has been proven successful on treating contaminated groundwater, pilot testing would be required to determine if this technology would be effective in treating the unsaturated soils 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 proposed remedy, as shown on Figure 8, are as follows:

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

2. 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.

3. 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.

4. 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.

5. A pilot study to evaluate the effectiveness and design parameters of chemical oxidation applied to source area soils.

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

7. Installation, operation, maintenance and monitoring of vapor intrusion controls to reduce tetrachloroethene (PCE) concentrations in indoor air at the nearby R&D Carpet and Tile building to ambient background levels.

8. A site management plan would be developed to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would 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.

9. Imposition of an institutional control in form of an environmental easement that would (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. Once soil, soil gas and groundwater concentrations are treated to unrestricted use levels, the appropriate institutional controls could be removed.

10. The property owner would provide an annual certification, prepared and submitted by a professional engineer or environmental professional acceptable to the NYSDEC, which would certify that the institutional controls 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 or constitute a violation or failure to comply with any operation and maintenance or site management.

11. The 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.

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.

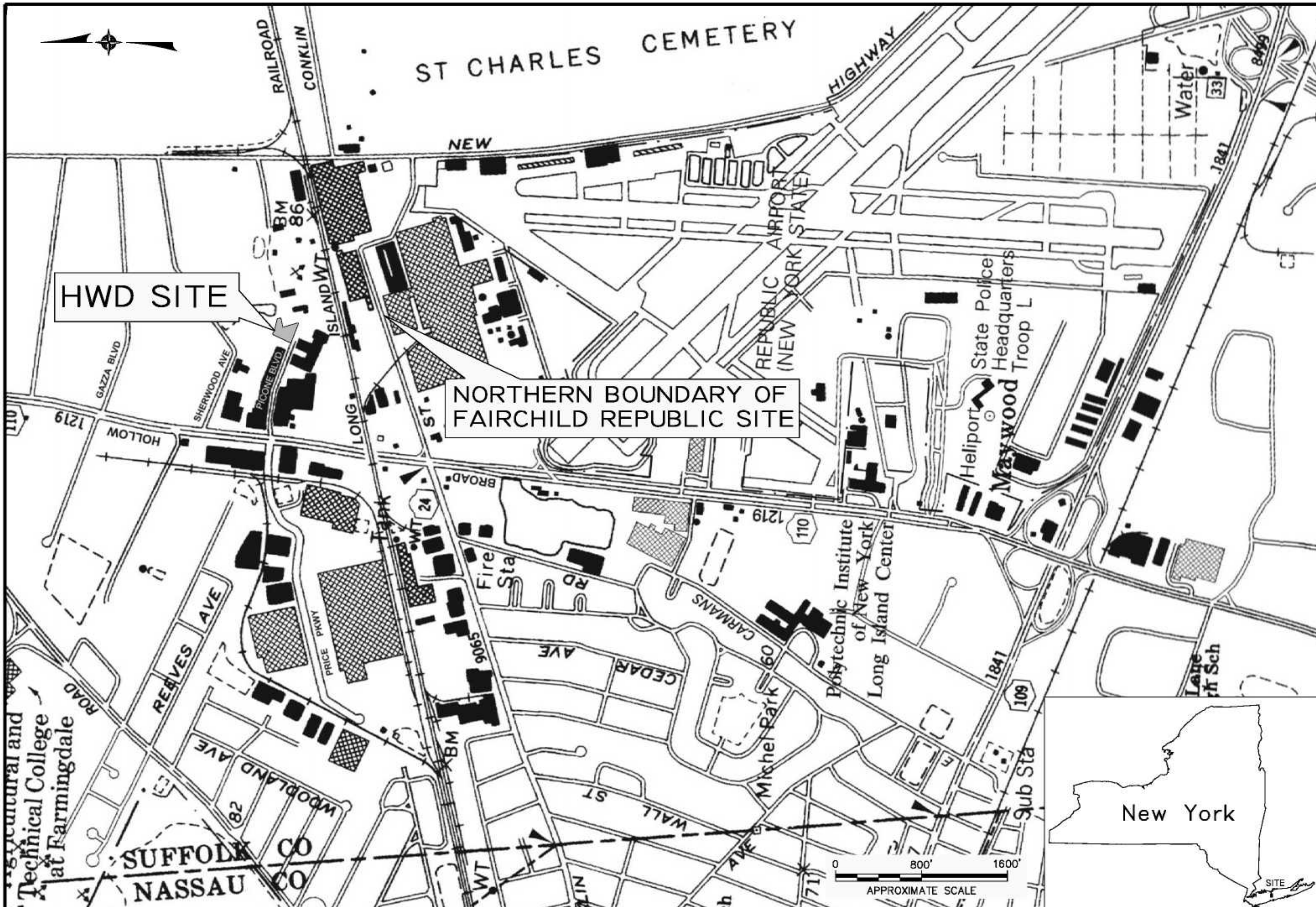
[b] SCG = standards, criteria, and guidance values.

[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

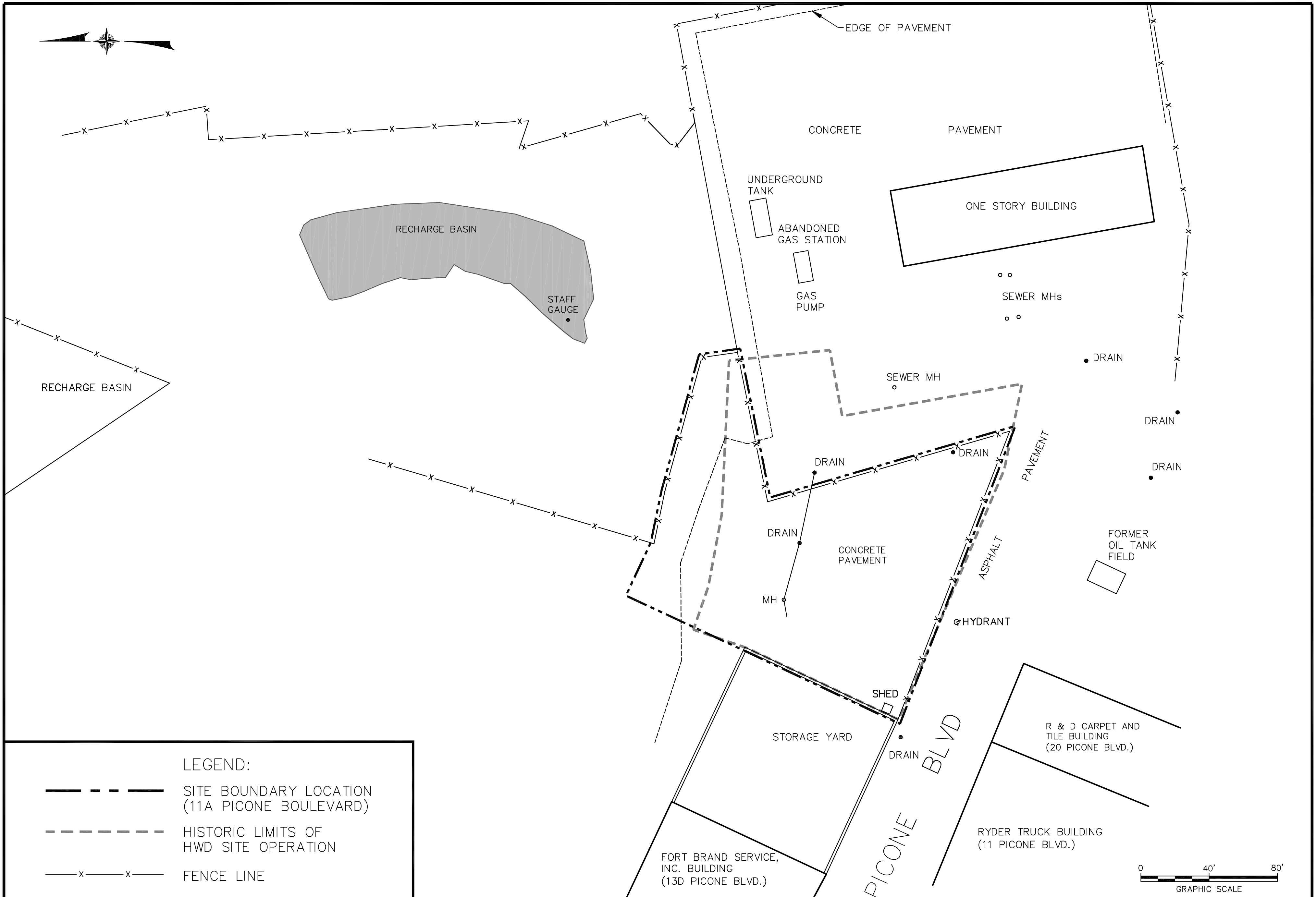
Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
1. No Action	$0	$36,000	$447,000
2. In-Situ Chemical Soil Oxidation and In-Situ Groundwater Chemical Oxidation	$1,720,000	$72,000	$1,860,000
3. Soil Vapor Extraction and In-Situ Groundwater Chemical Oxidation	$1,440,000	$102,000	$2,010,000
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

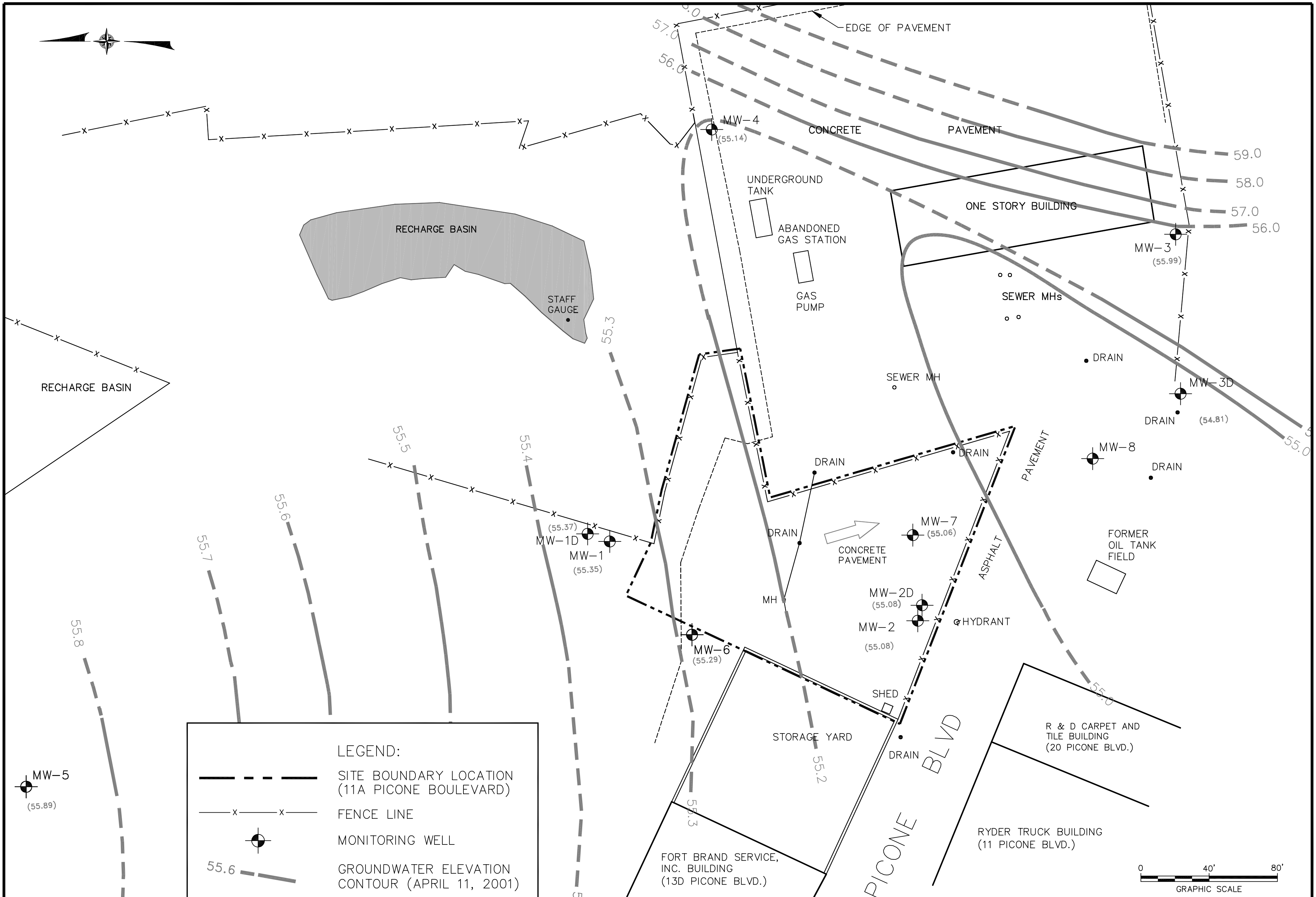
FIGURE 1



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SITE MAP

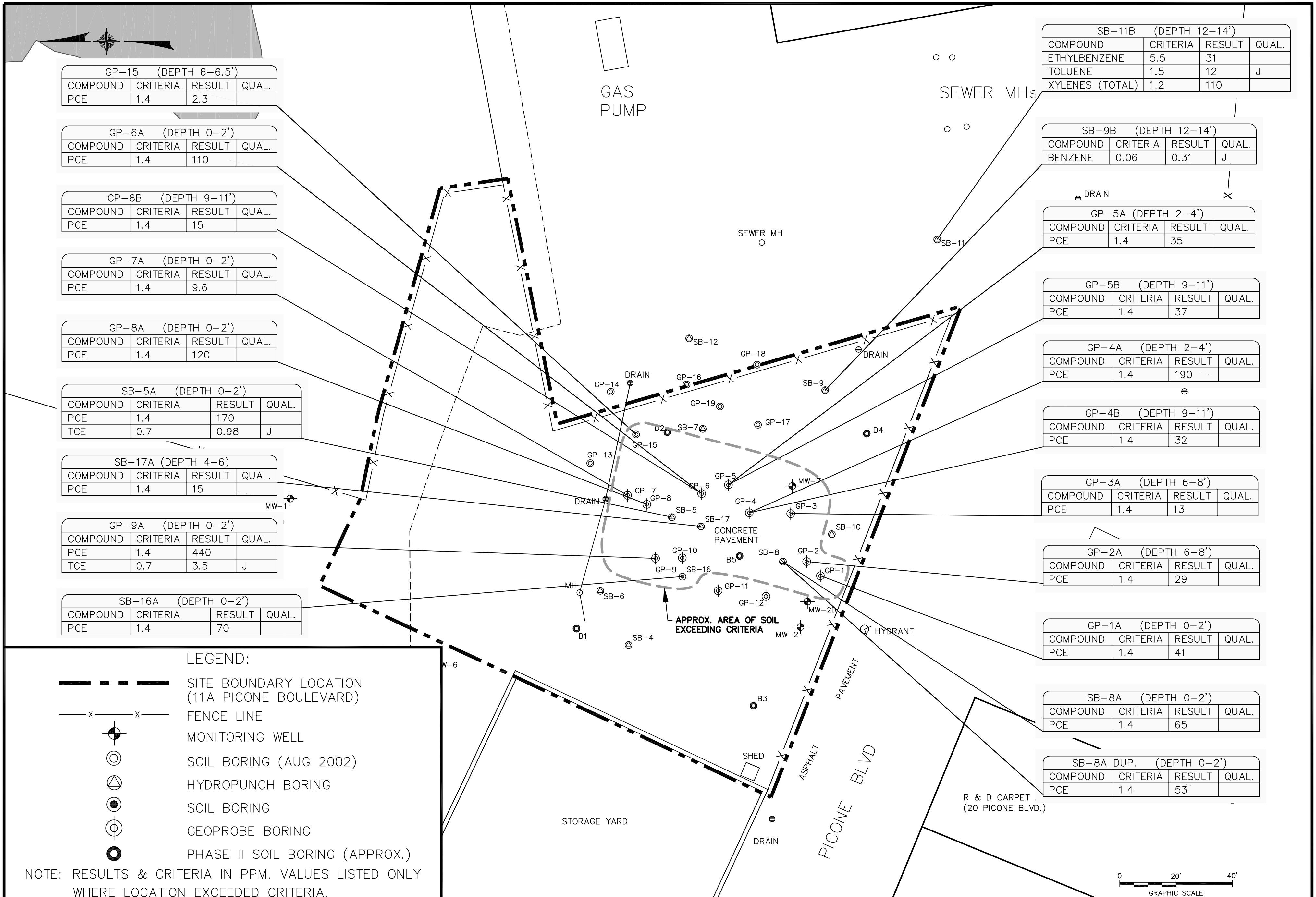
FIGURE 2



HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

MONITORING WELLS & GROUNDWATER CONTOURS

FIGURE 3



GP-15 (DEPTH 6-6.5')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	2.3	

GP-6A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	110	

GP-6B (DEPTH 9-11')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	15	

GP-7A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	9.6	

GP-8A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	120	

SB-5A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	170	
TCE	0.7	0.98	J

SB-17A (DEPTH 4-6)

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	15	

GP-9A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	440	
TCE	0.7	3.5	J

SB-16A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	70	

SB-11B (DEPTH 12-14')

COMPOUND	CRITERIA	RESULT	QUAL.
ETHYLBENZENE	5.5	31	
TOLUENE	1.5	12	J
XYLENES (TOTAL)	1.2	110	

SB-9B (DEPTH 12-14')

COMPOUND	CRITERIA	RESULT	QUAL.
BENZENE	0.06	0.31	J

GP-5A (DEPTH 2-4')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	35	

GP-5B (DEPTH 9-11')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	37	

GP-4A (DEPTH 2-4')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	190	

GP-4B (DEPTH 9-11')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	32	

GP-3A (DEPTH 6-8')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	13	

GP-2A (DEPTH 6-8')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	29	

GP-1A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	41	

SB-8A (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	65	

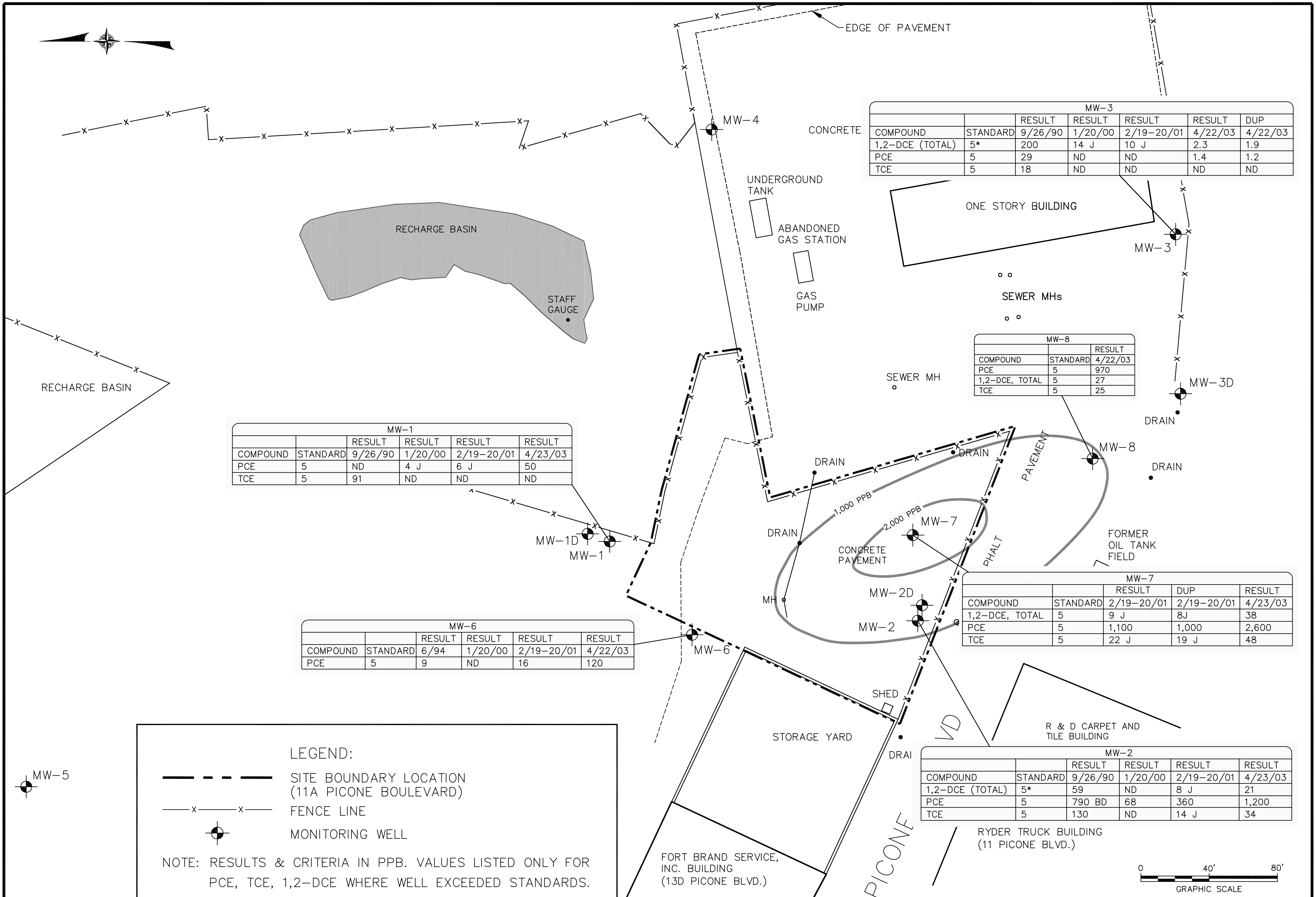
SB-8A DUP. (DEPTH 0-2')

COMPOUND	CRITERIA	RESULT	QUAL.
PCE	1.4	53	

HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

SOIL SAMPLE LOCATIONS & VOC RESULTS

FIGURE 4



MW-3

COMPOUND	STANDARD	RESULT 9/26/90	RESULT 1/20/00	RESULT 2/19-20/01	RESULT 4/22/03	DUP 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

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

MW-1

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

MW-7

COMPOUND	STANDARD	RESULT 2/19-20/01	DUP 2/19-20/01	RESULT 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

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

MW-2

COMPOUND	STANDARD	RESULT 9/26/90	RESULT 1/20/00	RESULT 2/19-20/01	RESULT 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

LEGEND:

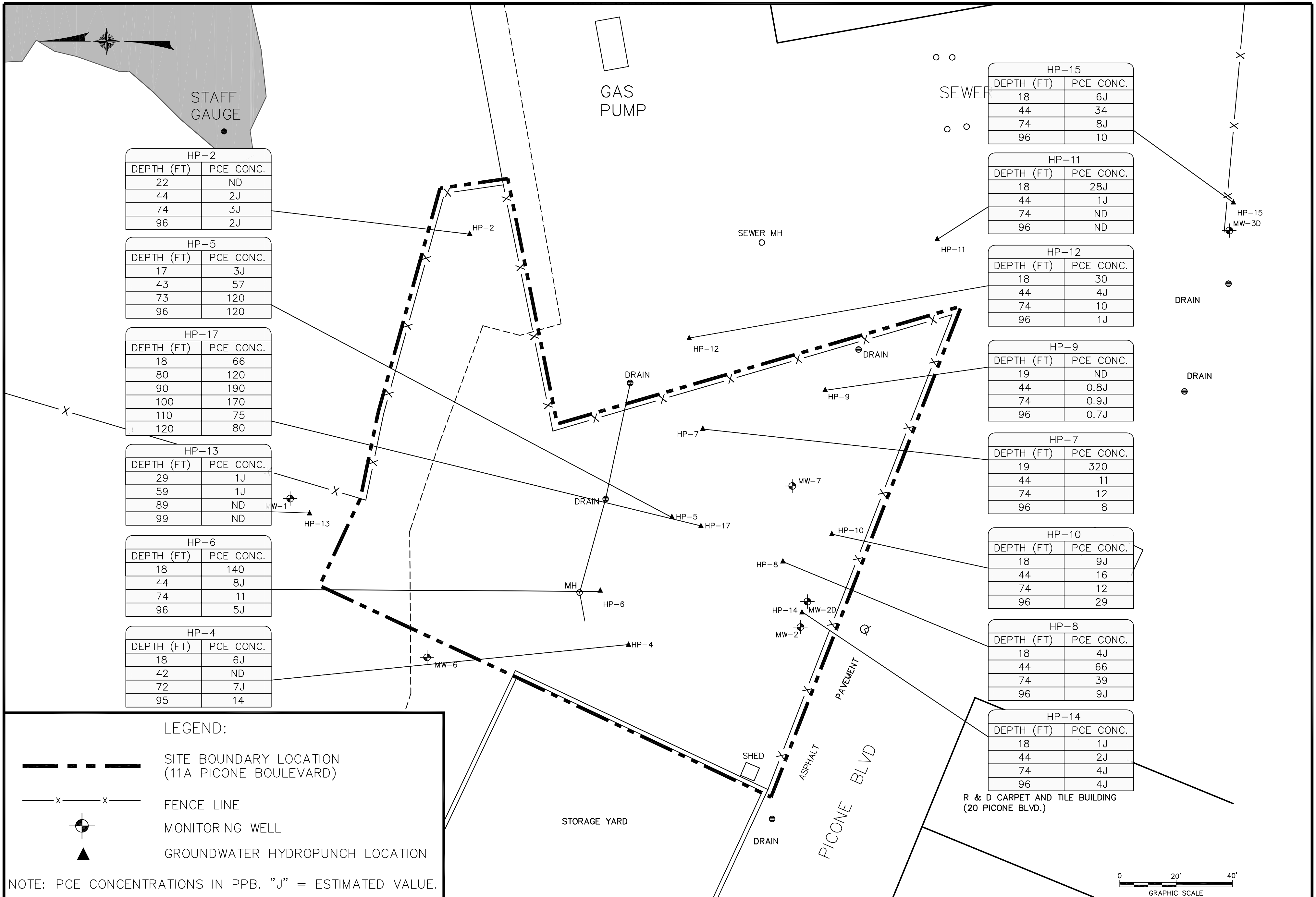
- SITE BOUNDARY LOCATION (11A PICONE BOULEVARD)
- FENCE LINE
- MONITORING WELL

NOTE: RESULTS & CRITERIA IN PPB. VALUES LISTED ONLY FOR PCE, TCE, 1,2-DCE WHERE WELL EXCEEDED STANDARDS.

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

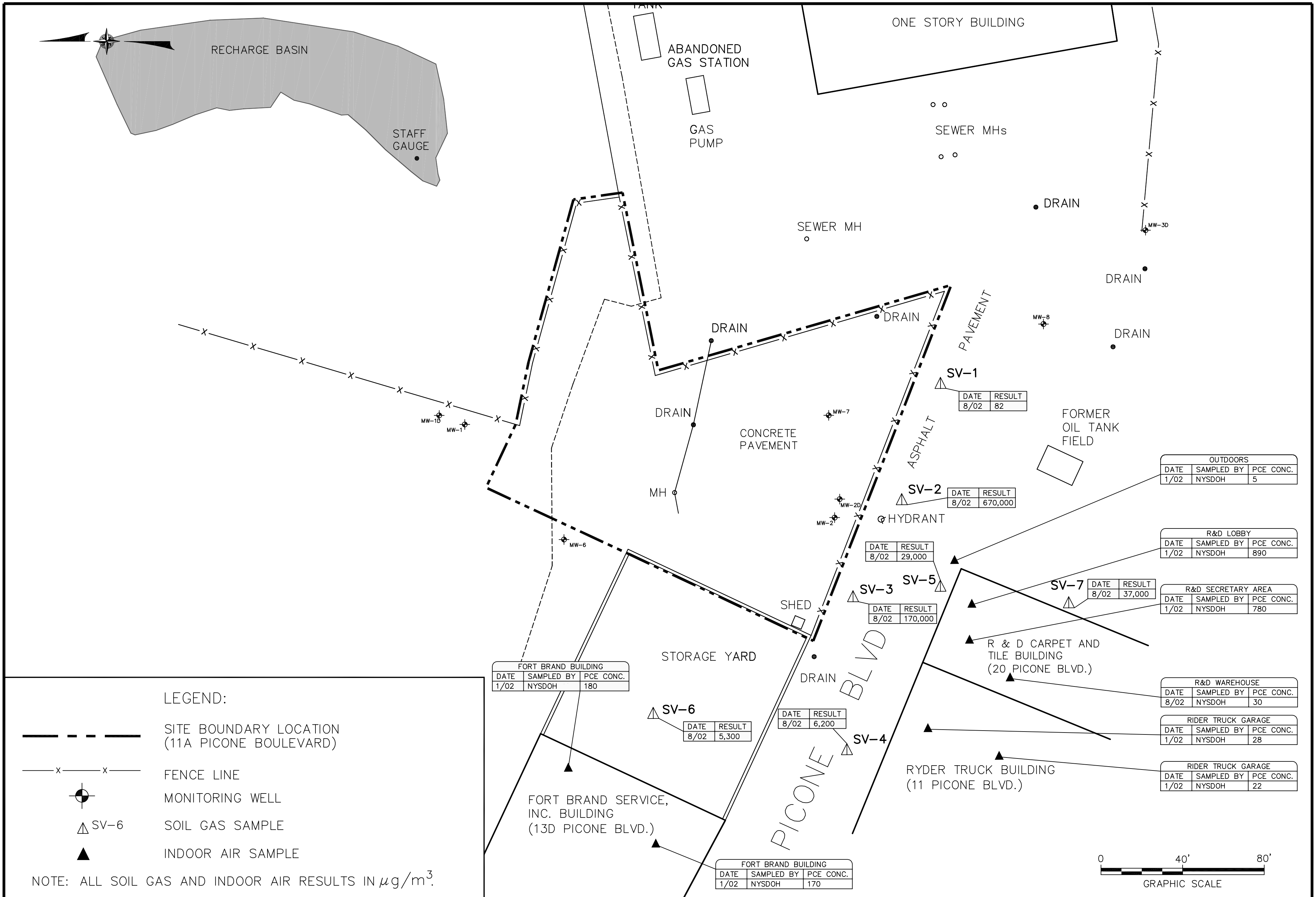
HP-14

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

HAZARDOUS WASTE DISPOSAL SITE
FARMINGDALE, SUFFOLK COUNTY, NEW YORK

GROUNDWATER HYDROPUNCH RESULTS

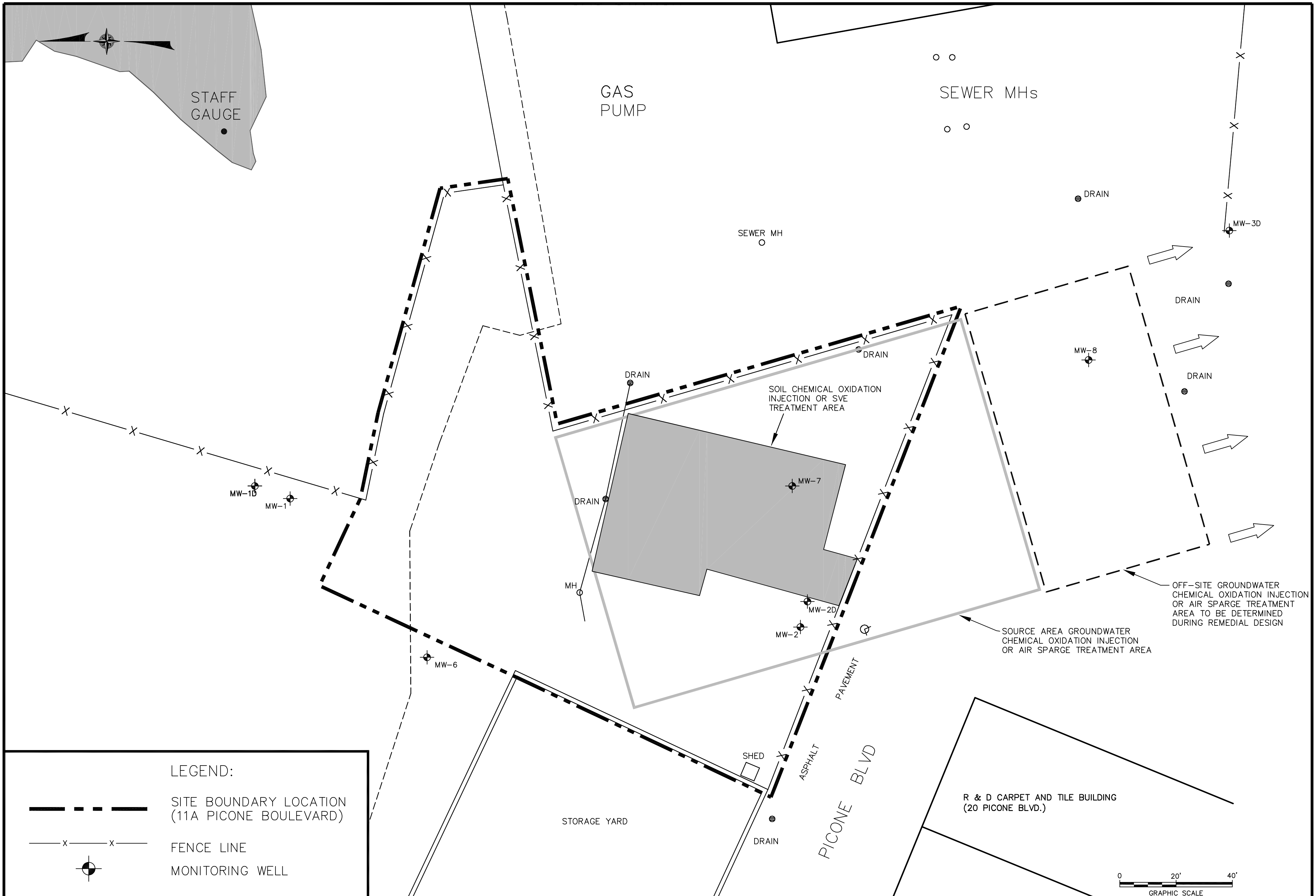
FIGURE 6



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

PROPOSED REMEDIAL ACTION

FIGURE 8