Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Harder Tree Services Site
Hempstead, Nassau County, New York
Site Number 1-30-035

March 2003

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

DECLARATION STATEMENT - RECORD OF DECISION

Harder Tree Services Inactive Hazardous Waste Disposal Site
Hempstead, Nassau County New York
Site No. 1-30-035

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Harder Tree Services 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 Harder Tree Services 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 Harder Tree Services site and the criteria identified for evaluation of alternatives, the NYSDEC has selected a combination of excavation and off-site disposal of shallow on-site pesticide contaminated soils, stabilization of deep on-site pesticide contaminated soils, excavation and off-site disposal of off-site pesticide contaminated soils, and a site cover. The components of the remedy are as follows:

- A combination of excavation and stabilization to remove/treat over 90% of the on-site pesticide mass including excavation of shallow on-site pesticide contaminated soils to prevent human contact and *in-situ* stabilization of deeper pesticide contaminated on-site soils to protect groundwater.

- Excavation of off-site pesticide contaminated soils to prevent human contact.

- Removal of pesticide contaminated wastes from on-site leaching pools.

- Disposal of the excavated material to an appropriate off-site NYSDEC approved disposal facility.

- Backfill of the excavated areas with clean fill.

- Replacement of leaching pool D-2 with a catch basin or appropriate drainage system.

- Placement and repair of cover materials on-site to limit human contact with the soil consisting of asphalt, twelve inches of clean soil or other approved material.

- Development of a soil management plan to address residual contaminated soils that may be excavated during future activities at the site.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will require compliance with the approved soils management plan.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Nassau County Health Department

- Implementation of a long-term monitoring program.

- Annual certification that the institutional and engineering controls are still in place.

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.

_____ _____

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

TABLE OF CONTENTS

SECTION **PAGE**

RECORD OF DECISION

Harder Tree Services Site
Hempstead, Nassau County, New York
Site No.1-30-035
March 2003

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 this remedy for the Harder Tree Services 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 tree service and pest control facility and a pesticide spill have resulted in the disposal of hazardous wastes, including pesticides. These wastes have contaminated the soil and groundwater at the site, and have resulted in:

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

- 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 combination of excavation and stabilization to remove/treat over 90% of the on-site pesticide mass including excavation of shallow on-site pesticide contaminated soils to prevent human contact and *in-situ* stabilization of deeper pesticide contaminated on-site soils to protect groundwater.

- Excavation of off-site pesticide contaminated soils to prevent human contact.

- Removal of pesticide contaminated wastes from on-site leaching pools.

- Disposal of the excavated material to an appropriate off-site NYSDEC approved disposal facility.

- Backfill of the excavated areas with clean fill.

- Replacement of leaching pool D-2 with a catch basin or appropriate drainage system.

- Placement and repair of cover materials on-site to limit human contact with the soil consisting of asphalt, twelve inches of clean soil or other approved material.

- Development of a soil management plan to address residual contaminated soils that may be excavated during future activities at the site.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will require compliance with the approved soils management plan.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Nassau County Health Department

- Implementation of a long-term monitoring program.

- Annual certification that the institutional and engineering controls are still in place.

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.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Harder Tree Services Site is located at 63 Jerusalem Avenue in the Town of Hempstead, Nassau County and consists of approximately 1.3 acres (see Figures 1 and 2). The property is generally flat and contains several buildings including a two-story office building, one multi-bay garage, one garage with attached greenhouse and shed, and one residential structure. The site remains an active tree service operation. Most of the remainder of the property is paved except for the 50x50 area, landscape area, and a few areas behind buildings. The area around the site is mixed residential and commercial in nature. The site is bordered by a gasoline station on the west, an apartment building on the east, a residential area on the north and Jerusalem Avenue on the South. The house located on the southeast corner of the site is owned by the Harders, but serves as rental property.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Harder Services, Inc. has operated at this location since 1939 and continues into the present. The layout and operations of the site varied over time, but consisted of pesticide control and tree-related services. A variety of materials associated with these operations have been present at the site.

3.2: Remedial History

In 1984, a several-hundred-gallon spill of the pesticide "methoxychlor" occurred on the site in the vicinity of leaching pool, LP-1. Most of the spilled material was recovered and LP-1 was closed and filled with sand. The NYSDEC conducted a Phase I investigation at the site during 1984 and 1985 where drain and waste samples were collected. 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. Based on additional data, in 1986, 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.

A Phase II investigation was performed by the NYSDEC during 1986 and 1987. During this investigation six groundwater monitoring wells were installed on-site and sampled. The results of the Phase I and Phase II investigations are presented in the Phase II Investigation Report, dated March1987. In 1988, additional soil samples were collected from the 50x50 area and two additional wells (MW-7 and MW-8) were installed and sampled.

A Site Assessment Update was performed from January 1999 to May 1999. As part of this assessment several soil samples were collected and existing monitoring wells were re-sampled. The results of the study are summarized in the Site Assessment Update Report, May 1999.

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 Harder Services, Inc. entered into a Consent Order on November 29, 2000. The Order obligates the responsible parties to implement a 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 2000 and August 2002**.** 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;
- Collection of approximately 68 surface and subsurface samples;
- Collection of 6 waste samples from leaching pools and drains;
- Collection of 13 surface and subsurface samples from properties adjacent to the site;
- Installation of an additional downgradient monitoring well for analysis of groundwater;
- Sampling of ten new and existing monitoring wells;
- A survey of public and private water supply wells in the area around the site;

To determine whether the soil, groundwater, and leaching pool sediments 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".

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 report.

5.1.1: Site Geology and Hydrogeology

Fill material consisting of brown to dark brown sandy loam is present to a depth of approximately two to three feet beneath the site. Beneath the fill material is approximately 100 feet of glacial deposits consisting of well-graded to poorly-graded fine to coarse-grained sand with gravel. There are two primary aquifers beneath the site. The upper aquifer thickness is approximately 70 to 75 feet in thickness with the depth to groundwater approximately 25 to 30 feet below ground surface. The deeper aquifer is the Magothy aquifer estimated to be 400 feet thick in the area of the site. The horizontal groundwater flow direction in the site area is south-southwest.

Most of the surface water runoff is captured by on-site storm water leaching pools. There are no natural streams, rivers or lakes within one-mile downgradient of the site.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater and waste 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 pesticides.

The pesticides of concern are aldrin, chlordane, 4,4'-DDT, endosulfan, heptachlor, and their breakdown products. These compounds are generally used as insecticides.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated. The data for the Site Assessment Update, performed just prior to the RI, is included in this discussion for completeness.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for waste and soil. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in wastes, soils and groundwater 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.

Waste Materials

Waste samples were collected from the leaching pools and drains located on-site. Leaching pools consist of open bottom concrete drywells and include D-2, LP-2, LP-3, and former LP-1. The drain samples, D-1 and D-3, were collected from solid bottom catch basins. The highest concentration of pesticides were detected from leaching pool D-2, located near the center of the site as shown on Figure 3. The wastes in this structure were located approximately 11 feet below ground surface. In the top foot of these wastes, various pesticides were detected totaling 4,784 ppm with 4,4'-DDD detected the highest at 1,600 ppm, well above the SCG of 2.9 ppm, and chlordane detected at 260 ppm compared to the SCG of 0.54 ppm. Pesticide levels decreased with depth with total concentrations of 891 ppm at 3-4 feet below top of sediments, 54 ppm at 8-10 feet and 10.7 ppm at 14-16 feet.

Waste samples from the other two active leaching pools also contained pesticides above SCGs, but not as high as levels in D-2. LP-2 and LP-3 contained chlordane at 2.9 ppm and 4.9 ppm, respectively, exceeding the SCG of 0.54 ppm. Samples were also collected from wastes in drains D-1 and D-3. Total pesticides were present in these drains at 43 ppm and 78 ppm, respectively.

Surface Soil

Since most of the site is paved, surface soil samples (0-3" below ground surface) were limited to the few areas on-site where pavement was not present and in off-site areas north of the site. The highest detections on- site were from two samples in the SS-4 Area, collected near the fence line.

Sample SS-4 contained several pesticides at levels exceeding 100 times the SCGs including heptachlor, dieldrin and chlordane. Higher levels were detected in sample SS-11 with heptachlor at 3,300 ppm, 33,000 times the cleanup objective of 0.10 ppm, dieldrin at 2,700 ppm, 61,000 times the cleanup objective of 0.044 ppm, and chlordane at 1,730, 1,600 times the cleanup objective of 0.54 ppm.

Four residential yards bordering the site to the north were sampled. Each yard contained similar pesticides as those found on-site at concentrations above SCGs. Of those bordering the 50 x 50 Area, the highest concentration was dieldrin at 8.6 ppm in sample SS-9. Three samples collected from the yard adjacent to the SS-1 Area also exceeded SCGs with the highest detection being 4,4'-DDT at 4.1 ppm in sample SS-36.

Subsurface Soil

Subsurface soil samples (below 3 inches or below the pavement) were collected from various areas on-site, as shown on Figure 3. Concentrations were significant in the SS-1, SS-4 and 50 x 50 Areas and deeper soils below leaching pool D-2 and former leaching pool LP-1. In the SS-1 Area samples were collected just below pavement and from 3-4 feet below grade. At least one or more pesticides exceeded SCGs in all samples, with levels generally decreasing in the deeper samples. Samples locations SS-1, SS-17, SS-18, SS-21 and SS-22 contained pesticides in excess of 100 times the SCGs with total pesticides highest in sample SS-17 (3-4 feet) at 7,521 ppm.

Samples were collected below the paved areas surrounding surface soil samples SS-4 and SS-11 to determine the extent of contamination in this area. Levels decreased laterally from these locations and in soils sampled 3-4 feet below SS-4 and SS-11. Dieldrin was the only pesticide detected in the 3-4 foot samples greater than 100 times the SCGs at a level of 7.6 ppm in SS-11. One sample was collected off-site, east of SS-4 under the adjacent pavement. Concentrations were slightly above SCGs with total pesticides at 8 ppm.

Four soil boring locations were sampled from the 50 x 50 area from several two-foot intervals to a final depth of 10 feet (GP-2) and 30 feet (GP-1, GP-3, and GP-4). Several pesticides exceeded SCGs in the 0-2 foot zone at all four locations, with one or more pesticides exceeding 100 times the SCGs in all 0-2 foot samples except GP-1. Concentrations decreased significantly below this depth in all samples except GP-4 which contained the highest levels of pesticides: 8,305 ppm from 0-2 feet, 5,494 ppm (4-6 feet), 5,040 ppm (8-10 feet), and below SCGs at 18-20 feet and 28-30 feet.

Leaching pool LP-1 was closed and filled with sand after the 1984 spill. A geoprobe boring was used to collect two samples below the interface of the fill and native soil. The first sample was collected from 15-17 feet below grade and contained relatively high concentrations of pesticides totaling 4,650 ppm. The second sample collected from 24-25 feet contained 217 ppm total pesticides. Soil samples (D-2A and D-2B) were collected adjacent to leaching pool D-2, below the level of the sediment interface, to determine if the contamination within this structure had migrated laterally. Although several pesticides were detected in these samples, concentrations were below SCGs except chlordane detected at 1.4 ppm in D-2A (14-15 feet below ground surface), slightly above the SCG of 0.54 ppm.

Several samples were collected in the landscape area, but pesticides were below or only slightly exceeded the SCGs in these samples. The highest compound detected was chlordane at 8.7 ppm. This area is actively used by the facility and samples were collected below a thick layer of mulch.

Two samples were collected off-site adjacent to the 50x50 area from 3 to 4 feet below grade. Pesticide levels were below SCGs in both samples indicating that the contamination is limited to shallow soils in this area.

Groundwater

A total of ten wells were sampled during the RI and Site Assessment Update. Sample results are shown on Figure 4. Groundwater samples from all six on-site wells exceeded the chlordane standard of 0.05 ppb, with the highest concentration found in MW-8 (60 ppb in 1999). Pesticide concentrations decreased in downgradient wells with chlordane decreasing to 7.1 ppb in MW-9, 0.49 ppb in MW-5 and non-detect in MW-10, located approximately 550 feet from the site. Several pesticides were also detected above groundwater standards in MW-7, which is located approximately 260 feet upgradient of the site, indicating sources other than the site are impacting the local groundwater. Chlordane in this well exceeded standards with a concentration of 0.16 ppb.

Based on the decrease in groundwater contamination in off-site wells MW-9 and MW-5 and the absence of contamination in well MW-10, the on-site pesticide contamination appears to diminish quickly downgradient of the site. This is likely due to the extremely low solubility of most pesticides in water and affinity pesticides have to adsorb to soil particles.

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.

Pathways which are known to or may exist at the site include:

- ingestion of groundwater
- dermal contact with soils

The ingestion of groundwater is a potential pathway, however, the ingestion of groundwater is not expected because the surrounding area is serviced by public water. Although contaminated groundwater was detected off-site, no site-related contamination has been detected in any downgradient public water supply wells, the nearest of which are located approximately 1.75 miles south of the site.

Dermal contact with surface soil contamination is possible on-site since several areas on the Harder property are unpaved and pesticide use is on-going. Dermal contact with and ingestion of surface soil contamination is possible off-site since site-related pesticide contamination was detected in several backyards that are adjacent to the Harder site. Dermal contact to subsurface soil contamination is possible during future development or utility repair involving excavation on-site.

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 an urban setting and there are no natural surface water bodies (streams, rivers or lakes) within a 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. This is a sole source aquifer and 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 pesticides in surface and subsurface soils;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards;
- the risk of ingestion of groundwater affected by the site that does not attain drinking standards; and
- off-site migration of groundwater that does not attain ambient groundwater quality standards.

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

- ambient groundwater quality standards and
- SCGs for off-site 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 Harder Tree Services Site were identified, screened and evaluated in the FS report.

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 10 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 10 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated wastes, soils and groundwater at the site.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It allows 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: Limited Soil Excavation/Disposal, Stabilization, Site Cover, and Institutional Controls

Present Worth: *$647,000*
Capital Cost: *$469,000*
Annual OM&M:
(Years 1-10): *$19,400*

This alternative would consist of removal of shallow soils from the most impacted on-site areas (soils in excess of 100 times the SCGs) and removal of all off-site soils in excess of SCGs with disposal to a NYSDEC approved landfill. Excavated soils would be characterized for proper disposal. For the 50x50 Area, the excavation depth would be limited to three feet below ground surface. Soils below this depth, with pesticides exceeding the SCGs, would be stabilized *in situ* to reduce soil permeability. Excavated on-site areas would be backfilled with clean fill and covered with pavement or 12 inches of clean soil. Soil below former leaching pool LP-1, from approximately 15 feet below ground to the water table would also be stabilized *in situ*. The impacted wastes from leaching pools and drains would also be excavated and similarly disposed off-site. For leaching pool D-2, those soils remaining below an excavation depth of 5 feet, would be stabilized *in situ*. The estimated volume of materials to be removed is 397 cubic yards. The combination of excavation and stabilization would remove/treat over 90 percent of the on-site pesticide mass. Pilot testing would be performed to evaluate the effectiveness of stabilization. If the pilot test results do not indicate acceptable reduction in pesticide leaching from the soil, then an alternative technology, such as capping the affected soil area with an impermeable membrane, would be utilized.

Surface and shallow on-site soils with pesticides above SCGs would remain on-site. Therefore, a site cover consisting of asphalt, clean soil or other approved material would be maintained over the entire site to limit human contact with the soil. The soil stabilization would reduce the potential for remaining impacted soils to impact the groundwater. Due to the reduction in soil permeability following soil stabilization, leaching pool D-2 would be replaced with a catch basin or appropriate drainage system. An institutional control would be implemented to prohibit the use of untreated groundwater at the site. In addition, a soil management plan would be developed to address residual contaminated soils that may be excavated from the site during future redevelopment. This alternative would also include a long-term monitoring program for operation and maintenance of the cover, groundwater monitoring and annual certification that the institutional and engineering controls are still in place.

Alternative 3: Soil Excavation/Disposal, Stabilization, and Institutional Controls

Present Worth: *$1,818,000*
Capital Cost: *$1,640,000*
Annual OM&M:
(Years 1-10): *$19,400*

This alternative is similar to Alternative 2 except that all reasonably accessible on-site soils exceeding SCGs would be excavated and disposed off-site. Reasonably accessible soils include those soils whose removal would not present a safety hazard or structural concern. Excavated areas would be backfilled with clean soil, however, since pesticide levels in surface and shallow on-site soils would be remediated below SCGs and backfilled with clean fill, there would be no requirement for a site cover. Off-site soils and leaching pool wastes would be removed to attain SCGs. *In situ* stabilization would be implemented on deeper soils, which are not accessible via excavation, including soils below LP-1 and D-2. Pilot testing and the contingency for *in situ* stabilization would be performed, as described in Alternative 2. The estimated volume of materials to be removed is 2,032 cubic yards. Excavated areas would be backfilled with clean soil. Since deeper stabilized soils would remain on-site, a soil management plan would be developed to address residual contaminated soils that may be excavated from the site during future redevelopment. An institutional control would be implemented to prohibit the use of untreated groundwater at the site. This alternative would include groundwater monitoring and annual certification that the institutional and engineering controls are still in place, similar to Alternative 2.

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.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 2, Limited Soil Excavation/Disposal, Stabilization, Site Cover, and Institutional Controls 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.

Alternative 2 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing the soils that create the most significant threat to public health, cover remaining on-site soils, eliminate all soils with pesticides concentrations greater than SCGs from impacted residential properties, and it will remediate the source of contamination to groundwater. Alternative 1, No Action, would not be protective of human health as it would not address human exposure to shallow soils leaving heavily contaminated soils on-site and contaminated surface soils off-site.

Because Alternatives 2 and 3 both satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 and 3 both have short-term impacts which can easily be controlled. The time needed to achieve the remediation goals would be similar.

Achieving long-term effectiveness is best accomplished by excavation and removal of the contaminated soils. Alternative 3 is more favorable because it would remove a greater volume of contaminated soil at the site than Alternative 2. However, Alternative 2 would remove the areas of highest soil contamination on-site and placement of a cover over the remainder of the site would be effective and reliable. Both alternatives would require institutional controls and long-term monitoring since the deeper, stabilized soil would remain on-site. However, Alternative 2 would rely more on institutional controls and property use restrictions as contamination would remain under the cover. Both alternatives would be equally effective for off-site soil as both alternatives would remove these soils to attain SCGs.

Both Alternatives 2 and 3 would reduce the toxicity and volume of contamination on and off site. Alternative 3 would remove a greater volume of contaminated soil, 2,032 cubic yards vs. 397 cubic yards for Alternative 2, although a portion of the extra soil volume would only be marginally above SCGs. In addition, both alternatives would equally reduce the mobility of the deeper contamination through in-situ stabilization. Therefore the total pesticide mass removed from the site or treated would be only slightly more for Alternative 3 than Alternative 2. Both alternatives would reduce the same volume of contaminated soil off-site.

Alternative 3 is slightly more difficult to implement than Alternative 2 since more soil would be excavated on-site and taken off-site as well as clean fill brought in to replace the excavated soils. Both alternatives would utilize *in situ* stabilization for the deeper soils. Pilot testing would be performed to evaluate its effectiveness. If the pilot test results do not indicate acceptable reduction in pesticide leaching from the soil, then an alternative technology, such as capping the affected soil area with an impermeable membrane, would be utilized.

The cost of Alternative 3 is significantly higher than Alternative 2 because of the greater volume of soil to be excavated. Although Alternative 3 is a more permanent remedy and would not require maintenance of a site cover, the additional cost to implement this alternative is not justified. Alternative 2 removes the highest levels of contamination from the site and is equally protective through installation of a site cover and soil management plan. These controls would not significantly restrict the current use of the property.

The estimated present worth cost to implement the remedy is $647,000. The cost to construct the remedy is estimated to be $469,000 and the estimated average annual operation, maintenance, and monitoring costs for 10 years is $19,400.

The elements of the selected remedy are as follows (see Figure 5 for areas of excavation and stabilization):

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

- A combination of excavation and stabilization to remove/treat over 90% of the on-site pesticide mass including excavation of shallow on-site pesticide contaminated soils to prevent human contact and *in-situ* stabilization of deeper pesticide contaminated on-site soils to protect groundwater.

  Confirmatory samples will be collected to verify excavation limits. For the 50x50 Area, the excavation depth will be limited to three feet below ground surface. The estimated stabilization depths are shown on Figure 5. A pilot test will be implemented to evaluate the reduction in leaching of pesticides from the soil after stabilization. If the pilot test results do not demonstrate an acceptable reduction in pesticide leaching from the soil, then an alternative technology, such as capping the affected soil with an impermeable membrane, will be utilized.

- Excavation of off-site pesticide contaminated soils with one or more pesticides exceeding SCGs to prevent human contact. Confirmatory samples will be collected to verify excavation limits.

- Removal of pesticide contaminated wastes from on-site drains and leaching pools containing one or more pesticides exceeding SCGs. For leaching pool D-2 the maximum excavation depth will be 5 feet below the top of wastes.

- Disposal of the excavated material to an appropriate off-site NYSDEC approved disposal facility.

- Backfill of the excavated areas with clean fill.

- Replacement of leaching pool D-2 with a catch basin or appropriate drainage system.

- Placement and repair of cover materials on the site to limit human contact with the subsurface soil consisting of asphalt, twelve inches of clean soil with demarcation barrier or other approved material.

- A soils management plan will be developed to 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.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will require compliance with the approved soils management plan.

- An institutional control will be imposed, in such form as the NYSDEC may approve, that will prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Nassau County Health Department.

- Since the remedy results in untreated hazardous waste remaining at the site, a long term monitoring program will be instituted. The monitoring will inspect the integrity of the site cover on an annual basis. Several monitoring wells will be sampled to confirm that levels are decreasing through natural attenuation. This program will allow the effectiveness of the site cover and soil stabilization to be monitored and will be a component of the operation, maintenance, and monitoring for the site.

- The property owner will complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will contain certification that the institutional controls and engineering controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

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 liste announcing the start of the project and availability of the RI/FS work plan.

- A public meeting was held on March 10, 2003 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
January 1999 - May 2002

WASTE (DRAINS & LEACHING POOLS)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Pesticides	Heptachlor	ND[c]-15	0.10	3/6
	Heptachlor Epoxide	ND	0.02	0/6
	Aldrin	ND-39	0.041	3/6
	Dieldrin	ND-3	0.044	2/6
	Endosulfan I	ND-610	0.90	3/6
	Endosulfan II	ND	0.90	0/6
	4-4'-DDT	ND-1,200	2.1	2/6
	4,4'-DDD	0.68-1,600	2.9	4/6
	4,4'-DDE	ND-69	2.1	2/6
	Alpha Chlordane	1.5-520	0.54	6/6
	Gamma Chlordane	1.4-420	0.54	6/6

SURFACE SOIL (ON-SITE)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Pesticides	Heptachlor	0.047-3,300	0.10	6/7
	Heptachlor Epoxide	ND-22	0.02	3/7
	Aldrin	ND-10	0.041	1/7
	Dieldrin	0.058-2,700	0.044	7/7
	Endosulfan I	ND-18	0.90	3/7
	Endosulfan II	ND-14	0.90	1/7
	4-4'-DDT	0.23-370	2.1	4/7
	4,4'-DDD	ND-410	2.9	3/7
	4,4'-DDE	ND-20	2.1	2/7
	Alpha Chlordane	0.20-630	0.54	7/7
	Gamma Chlordane	0.17-1,100	0.54	7/7

TABLE 1 (cont.)
Nature and Extent of Contamination
January 1999 - May 2002

SUBSURFACE SOIL (ON-SITE)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Pesticides	Heptachlor	ND-3,100	0.10	28/61
	Heptachlor Epoxide	ND-38	0.02	12/61
	Aldrin	ND-750	0.041	8/61
	Dieldrin	ND-2,400	0.044	30/61
	Endosulfan I	ND-570	0.90	4/61
	Endosulfan II	ND-110	0.90	2/61
	4-4'-DDT	ND-1,100	2.1	15/61
	4,4'-DDD	ND-570	2.9	16/61
	4,4'-DDE	ND-39	2.1	13/61
	Alpha Chlordane	ND-3,700	0.54	37/61
	Gamma Chlordane	ND-3,300	0.54	38/61

SURFACE SOIL (OFF-SITE)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Pesticides	Heptachlor	ND-0.76	0.10	4/11
	Heptachlor Epoxide	ND-3.1	0.02	10/11
	Aldrin	ND	0.041	0/11
	Dieldrin	0.078-8.6	0.044	11/11
	Endosulfan I	ND	0.90	0/11
	Endosulfan II	ND-0.47	0.90	0/11
	4-4'-DDT	0.34-7.7	2.1	7/11
	4,4'-DDD	ND-2.3	2.9	0/11
	4,4'-DDE	ND-4.4	2.1	5/11
	Alpha Chlordane	0.16-4.8	0.54	9/11
	Gamma Chlordane	0.089-4.7	0.54	8/11

TABLE 1 (cont.)
Nature and Extent of Contamination
January 1999 - May 2002

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Pesticides	Heptachlor	ND-0.11	0.04	2/10
	Heptachlor Epoxide	ND-2.1	0.03	4/10
	Aldrin	ND	ND (<0.001)	0/10
	Dieldrin	ND-5.7	0.004	5/10
	Endosulfan I	ND	(See note d)	0/10
	Endosulfan II	ND-1.8	(See note d)	0/10
	4-4'-DDT	ND-0.7	0.2	2/10
	4,4'-DDD	ND-1.9	0.3	2/10
	4,4'-DDE	ND-0.42	0.02	2/10
	Alpha Chlordane	ND-30	0.05	9/10
	Gamma Chlordane	ND-32	0.05	8/10

[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] ND = non-detect.

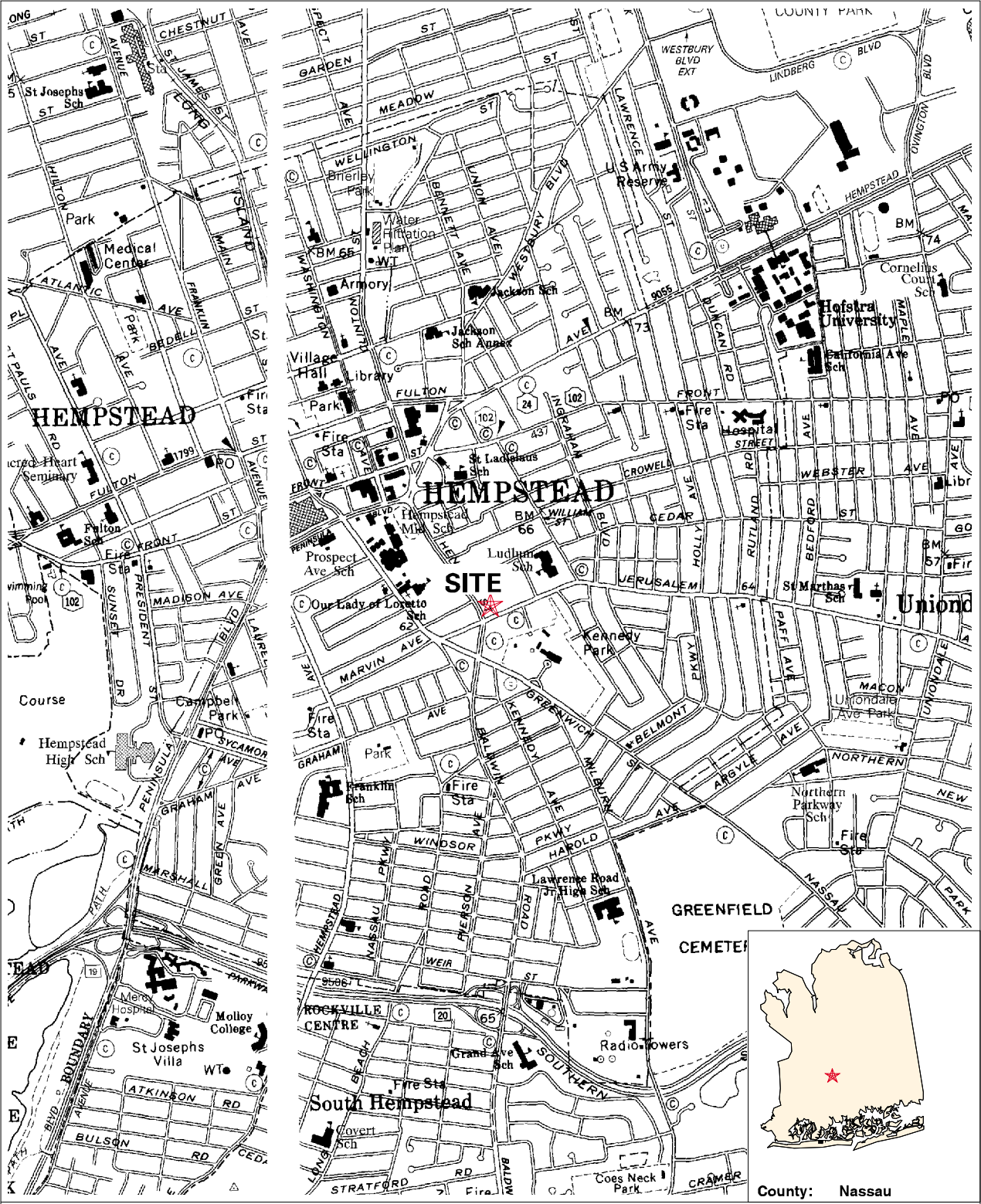
[d] no NYSDEC Class GA Ambient Water Quality Standard established for this compound.

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M[a]	Total Present Worth[b]
1. No Action	$0	$0	$0
2. Limited Excavation/Disposal, Stabilization, Site Cover, and Institutional Controls	$469,000	$19,400	$647,000
3. Excavation/Disposal and Stabilization	$1,640,000	$19,400	$1,818,000

a Annual OM&M based on groundwater monitoring for period of ten years.

b Total present worth calculated for 10 years OM&M at 5% interest rate.

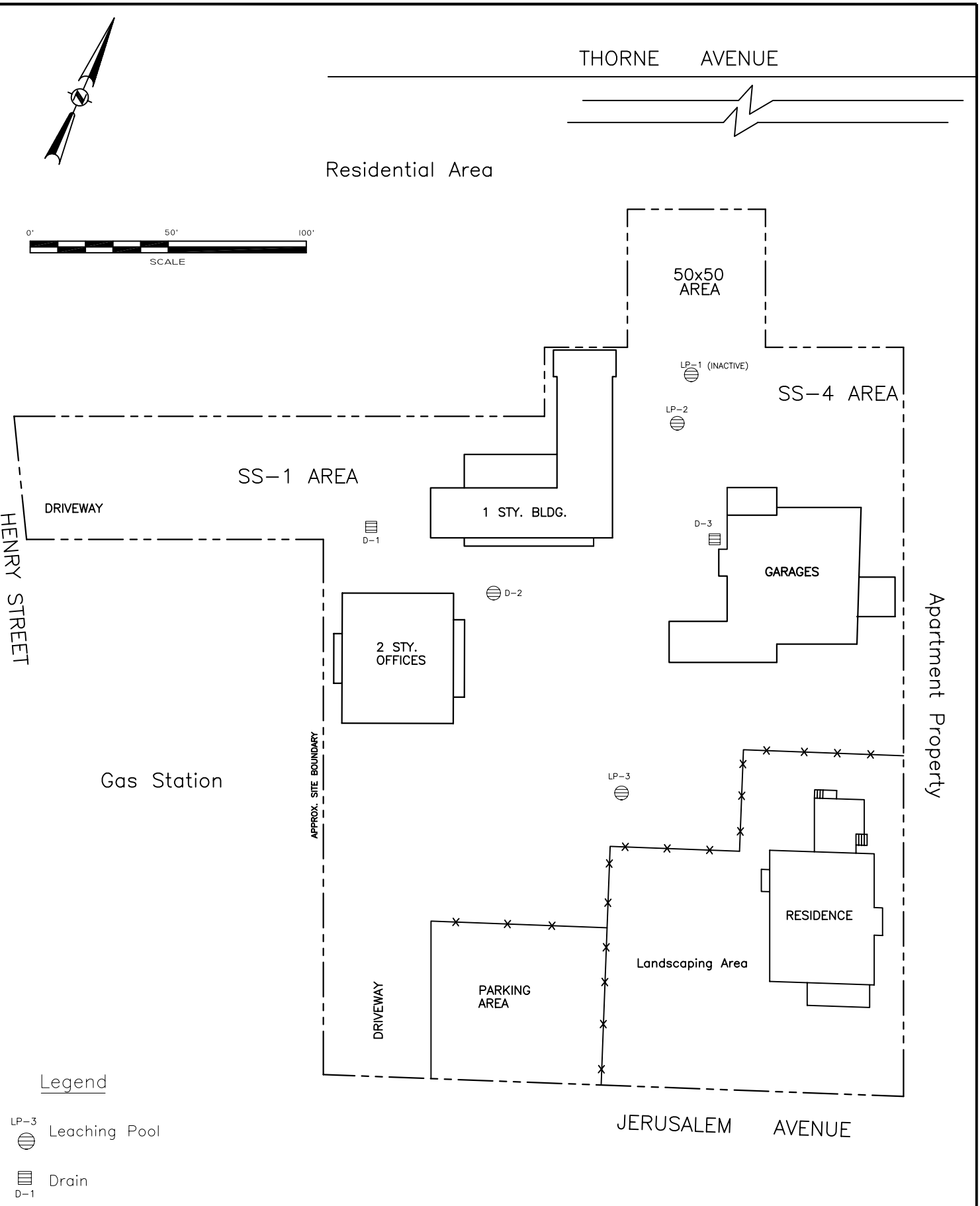


Site Location Map

130035 Harder Tree Service

NYSDOT Planimetric Quadrangle(s):

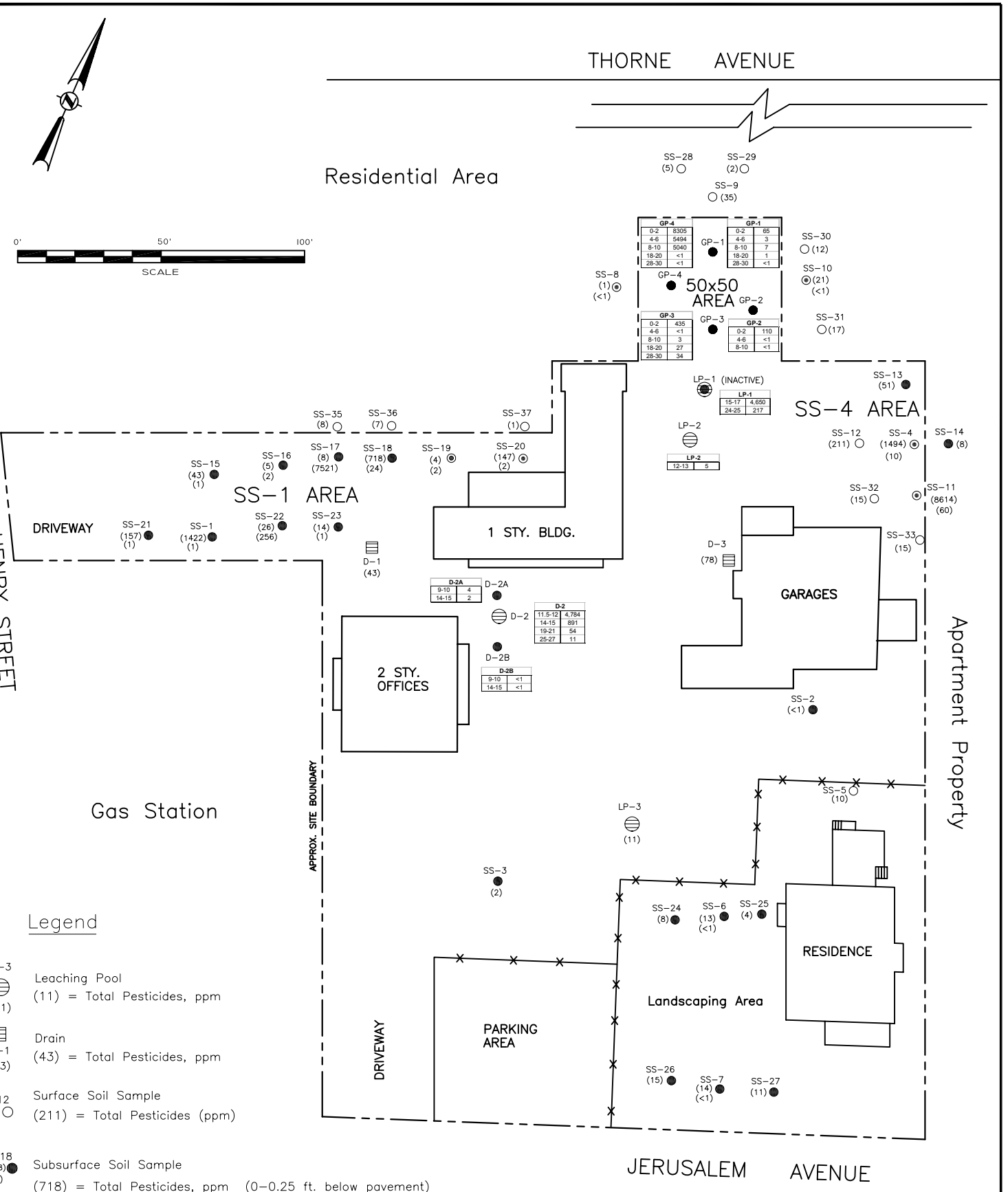
FREEPORT, LYNBROOK



HARDER TREE SERVICES SITE
HEMPSTEAD, NASSAU COUNTY, NEW YORK

SITE MAP

FIGURE 2



HARDER TREE SERVICES SITE
HEMPSTEAD, NASSAU COUNTY, NEW YORK

SOIL AND WASTE SAMPLES

FIGURE 3

MW-7			NYSDEC
Pesticides (ug/l)	1988	2001	Standards
Heptachlor	ND	**0.11**	0.04
Heptachlor Epoxide	ND	**0.036**	0.03
alpha-Chlordane	-	**0.1**	0.05
gamma-Chlordane	-	**0.061**	0.05
Chlordane (total)	**0.31**	-	0.05

MW-1				NYSDEC
Pesticides (ug/l)	1987	1988	2001	Standards
4,4'-DDT	**0.24**	ND	ND	0.2
alpha-Chlordane	-	ND	**0.56**	0.05
gamma-Chlordane	-	ND	**0.66**	0.05
Chlordane (total)	**0.19**	ND	-	0.05

MW-8				NYSDEC
Pesticides (ug/l)	1988	1999	2002	Standards
alpha-Chlordane	-	**28**	**30**	0.05
gamma-Chlordane	-	**32**	**28**	0.05
Chlordane (total)	**44**	-	-	0.05

MW-2				NYSDEC
Pesticides (ug/l)	1987	1988	1999	Standards
Dieldrin	**2.5**	**0.46**	**1.7**	0.004
alpha-BHC	ND	**0.46**	**0.11**	0.01
4,4'-DDD	ND	ND	**0.86**	0.2
alpha-Chlordane	-	-	**3.4**	0.05
gamma-Chlordane	-	-	**4.8**	0.05
Chlordane (total)	**9**	ND	-	0.05
delta-BHC	ND	**0.47**	**1**	0.04
beta-BHC	ND	ND	**1.3**	0.04
4,4'-DDE	ND	ND	**0.42**	0.02

MW-6				NYSDEC
Pesticides (ug/l)	1987	1988	1999	Standards
Dieldrin	**0.05**	ND	ND	0.004
Heptachlor	**0.19**	ND	**0.058**	0.04
4,4'-DDT	**0.48**	ND	**0.32**	0.2
alpha-Chlordane	-	-	**0.2**	0.05
gamma-Chlordane	-	-	**0.2**	0.05
Chlordane (total)	**0.49**	**0.8**	-	0.05

MW-4				NYSDEC
Pesticides (ug/l)	1987	1988	1999	Standards
Lindane	**0.21**	**0.25**	**0.35**	0.05
Dieldrin	ND	ND	**1.9**	0.004
Heptachlor	ND	**0.3**	ND	0.04
alpha-BHC	**0.03**	ND	**0.21**	0.01
4,4'-DDT	**0.48**	ND	ND	0.2
alpha-Chlordane	-	-	**2.5**	0.05
Chlordane (total)	ND	ND	ND	0.05
beta-BHC	ND	ND	**0.35**	0.04

MW-3			NYSDEC
Pesticides (ug/l)	1988	1999	Standards
Dieldrin	**0.04**	**0.28**	0.004
Heptachlor Epoxide	**0.085**	**0.11**	0.03
alpha-Chlordane	-	**0.58**	0.05
gamma-Chlordane	-	**0.53**	0.05
Chlordane (total)	ND	-	0.05

MW-9		NYSDEC
Pesticides (ug/l)	2001	Standards
Dieldrin	**5.7**	0.004
Heptachlor Epoxide	**2.1**	0.03
4,4'-DDD	**1.9**	0.3
4,4'-DDT	**0.7**	0.2
Endrin	**0.18**	ND
alpha-Chlordane	**2.8**	0.05
gamma-Chlordane	**4.3**	0.05

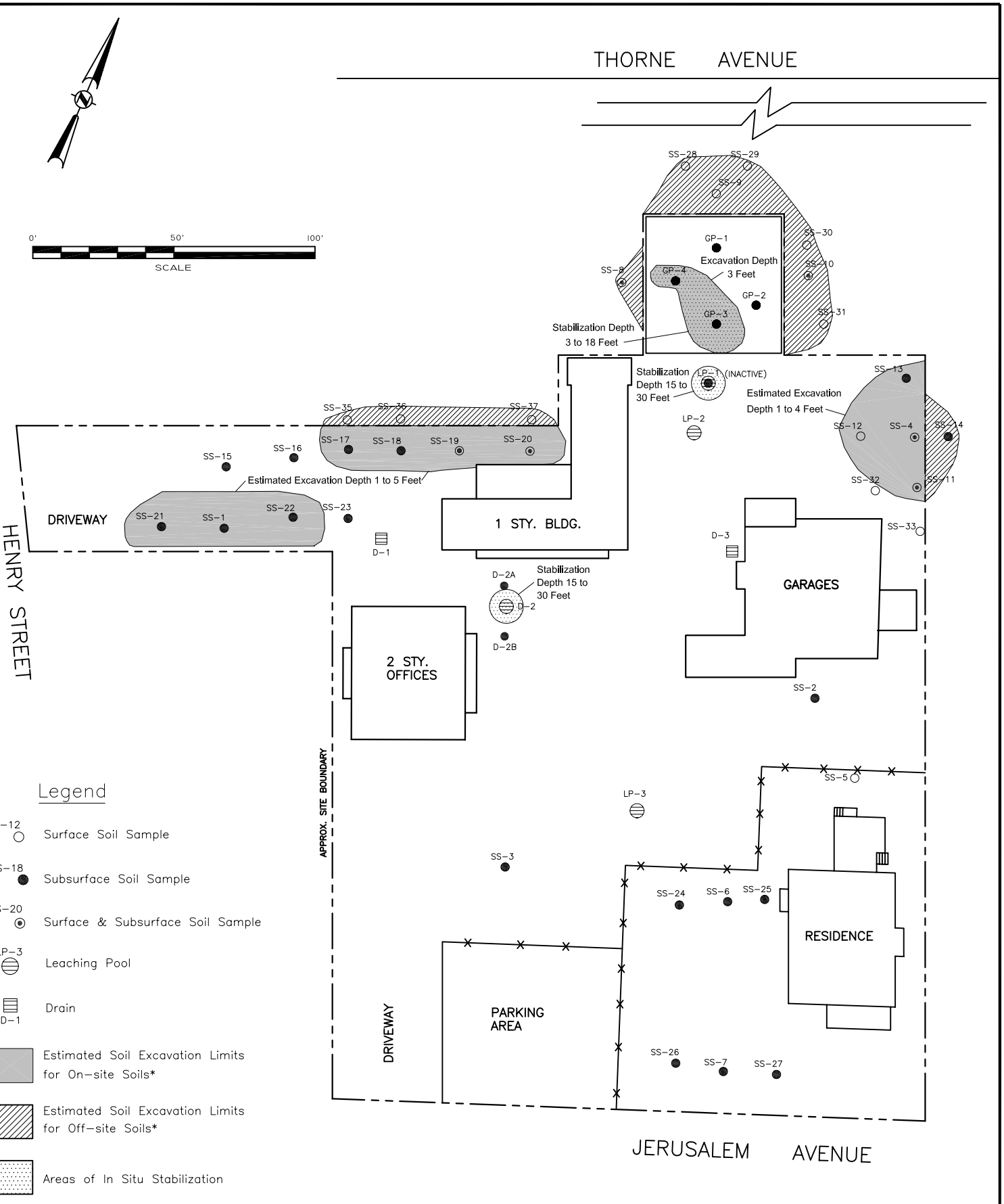
MW-10		NYSDEC
Pesticides (ug/l)	2002	Standards
Dieldrin	ND	0.004
Heptachlor	ND	0.04
Heptachlor Epoxide	ND	0.03
4,4'-DDT	ND	0.3
4,4'-DDT	ND	0.2
Endrin	ND	ND
alpha-Clordane	ND	0.05
gamma-Chlordane	ND	0.05

MW-5				NYSDEC
Pesticides (ug/l)	1988	1999	2001	Standards
Dieldrin	**0.047**	**1.4**	**0.67**	0.004
Heptachlor Epoxide	**0.12**	ND	**0.1**	0.03
alpha-Chlordane	-	**0.94**	**0.28**	0.05
gamma-Chlordane	-	**0.92**	**0.21**	0.05
Chlordane (total)	ND	-	-	0.05

HARDER TREE SERVICES SITE
HEMPSTEAD, NASSAU COUNTY, NEW YORK

MONITORING WELLS

FIGURE 4



* Confirmatory samples would be collected to verify remedial limits.

HARDER TREE SERVICES SITE
HEMPSTEAD, NASSAU COUNTY, NEW YORK

APPROXIMATE REMEDIAL BOUNDARIES

FIGURE 5

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Harder Tree Services Site
Hempstead, Nassau County, New York
Site No. 1-30-035

The Proposed Remedial Action Plan (PRAP) for the Harder Tree Services 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 February 21, 2003. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Harder Tree Services 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 March 10, 2003, 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 March 23, 2003.

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: The Town's water supply wells are currently not impacted. The Hempstead Water District may put a new well 100 feet to the west of the site behind the Jerusalem Avenue Fire House in Kennedy Memorial Park.

RESPONSE 1: The proposed location of the well would be side-gradient to the groundwater flow direction under the site and would be located in the deeper (Magothy) aquifer. Therefore, it is not expected that the well would be impacted by the site. In addition, the groundwater plume diminishes quickly off-site and was not detected in MW-10, located approximately 550 feet downgradient of the site. Implementation of the remedy for this site will remove or stabilize the sources of the groundwater contamination after which pesticides concentrations in the groundwater are expected to diminish over time.

COMMENT 2: What caused the contamination at this site?

RESPONSE 2: Various pesticides were used at the site as part of Harder's business as a pest control service. Spills during the routine storage and handling of these pesticides, as well as a spill of the pesticide methoxychlor in 1984, resulted in the release of these compounds into the environment.

COMMENT 3: Will future operation of the facility re-contaminate the site?

RESPONSE 3: It is our understanding that the facility no longer manages pesticides on-site as part of their business, which now consists of tree supply and pruning activities. If pesticides were to be used by the facility in the future, they would have to be registered with the NYSDEC. While storage and handling of pesticides on-site are the responsibility of the business, any spills above certain volumes must be reported to the NYSDEC's Division of Environmental Remediation which would respond and take necessary measures to ensure the proper clean up of any future spills.

APPENDIX B

Administrative Record

Administrative Record

Harder Tree Services Site
Site No. 1-30-035

1. Proposed Remedial Action Plan for the Harder Tree Services site, dated February 2003, prepared by the NYSDEC.

2. Fact Sheet for Harder Tree Services Site, dated February 2003, prepared by the NYSDEC.

3. "Feasibility Study for Harder Tree Services Site", dated March 2003, FPM Group, Inc.

4. "Revised Remedial Investigation Report for Harder Tree Services Site", dated April 2002, FPM Group Inc.

5. Fact Sheet for Harder Tree Services Site, dated February 16, 2001, prepared by the NYSDEC.

6. Order on Consent, Index No. W1-245-99-08, between NYSDEC and Harder Services, Inc. And Frank K. Harder, Jr., executed on November 29, 2000.

7. "Remedial Investigation/Feasibility Study Work Plan for Harder Tree Services", dated August 2000, FPM Group, Inc.

8. "Site Assessment Update Report for Harder Tree Services", dated May 1999, FPM.

9. Order on Consent, Index No. W1-245-8907, between NYSDEC and Harder Services, Inc. And Frank K. Harder, Jr., executed on December 3, 1998.

10. "Site Assessment Update Work Plan for Harder Tree Services", dated September 1998.