5. PROPOSED REMEDIAL ACTION PLAN, FRANKLIN CLEANERS SITE, INCORP. VILLAGE OF HEMPSTEAD NASSAU COUNTY N.Y.

2/98

#5

PROPOSED REMEDIAL ACTION PLAN

SUMMARY SHEET

SITE NUMBER 130050
SITE NAME Franklin Cleaners
TOWN AND COUNTY Inc. Village of Hempstead, Nassau County
PREPARED BY Tom Gibbons
DESCRIPTION OF PROBLEM

The former Franklin Cleaners operated as a dry cleaning store under various names from 1957 to 1991. Franklin Cleaners began dry cleaning operations during the late 1970s or early 1980s. The current owners purchased the property in April 1987. During the years when a dry cleaner operated at this property, a dry cleaning fluid "cooker", operated in the basement of the building.

In March 1990, the Nassau County Department of Health (NCDOH) investigated a complaint of tainted drinking water from a private residence downgradient of the site. The private supply wells on this property were found to contain PCE at up to 29,000 ppb. Sampling at the Franklin property revealed significant PCE contamination of on-site soils. The site was listed on the Registry of Inactive Hazardous Waste Disposal Sites in New York State on June 17, 1993.

A remedial investigation was carried out between 12/96 and 04/97. This investigation confirmed high PCE levels in onsite soils, at concentrations up to 450 ppm. A groundwater plume was delineated which extends nearly 1 mile downgradient from the Site with PCE levels up to 3 ppm. The depth of contamination ranges from the water table (20 feet bgs) to 80 feet bgs, the depth of a significant clay confining layer. Indoor air was sampled and revealed elevated levels of PCE in businesses and residential apartments on and near the site which exceed the NYSDOH proposed ambient air guidance value for residential air quality for PCE of 100 ug/m3.

DESCRIPTION OF REMEDY

NYSDEC is proposing Onsite Soil Vapor Extraction and Air Sparging and Offsite Extraction and Treatment as the remedy for this site. PCE would be eliminated from onsite soils and onsite and offsite groundwater to the extent practicable. The estimated present worth cost to implement the remedy is $2,254,000. The cost to construct the remedy is estimated to be $842,000 and the estimated average annual operation and maintenance cost for 30 years is $91,850.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved;
2. Soil vapor extraction (SVE) of PCE-contaminated soils onsite treatment of contaminated vapors using a vapor phase granular activated carbon (GAC) treatment system;
3. Air sparging of shallow onsite groundwater and capture of PCE vapors by the proposed SVE system;
4. Extraction of contaminated groundwater at the leading edge of the contaminant plume and treatment of water through the use of chemical precipitation and filtering of metals, air stripping of VOCs along with GAC treatment of off gasses, if necessary;
5. Offsite disposal of all spent carbon at a TSCA and RCRA-permitted incinerator;
6. Long-term groundwater and indoor air monitoring; and
7. Groundwater use restrictions.

Since the remedy results in untreated hazardous waste remaining both onsite and offsite, a long term monitoring program would be instituted. This program would allow the effectiveness of the selected remedy to be monitored and would be a component of the operation and maintenance for the site.

ISSUES

No significant issues exist

PROPOSED REMEDIAL ACTION PLAN

FRANKLIN CLEANERS SITE

Nassau County, New York
Site Number 1-30-050

February 1998

SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing the following remedial action for the Franklin Cleaners site:

- Air sparging of VOC-contaminated onsite groundwater;
- soil vapor extraction of VOC-contaminated onsite soils;
- carbon treatment of extracted VOCs;
- extraction and treatment of VOC-contaminated offsite groundwater using metals precipitation and filtration and air stripping;
- storm sewer discharge of treated groundwater; and
- long-term monitoring of the contaminated groundwater plume.

This remedy is proposed to address the threat to human health and the environment created by the presence of VOC-contaminated soils onsite and VOC-contaminated groundwater both onsite and offsite.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the rationale for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments submitted 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 (ECL) and 6 NYCRR Part 375. This document summarizes the information that can be found in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) reports available at the document repositories.

To better understand the site, and the alternatives evaluated, the public is encouraged to review the project documents which are available at the following repositories:

Mr. Thomas Gibbons
NYSDEC Central Office
50 Wolf Road
Albany, NY 12233-7010
Phone (518) 457-7924
Hours Mon. through Fri., 8:00 to 4:15

NYSDEC Region 1 Office
Environmental Remediation Unit
Building 40

Stony Brook, NY 11790
Phone (516) 444-0249
Hours Mon. through Fri., 8:30 to 4:45

Hempstead Public Library
115 Nichols Court
Hempstead, NY 11550
Phone (516) 481-6990
Hours Mon. thru Thur., 10:00 to 9:00
Friday 10:00 to 6:00
Saturday 9:00 to 5:00

Written comments on the PRAP can be submitted to Mr. Thomas Gibbons, Project Manager, at the above address.

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

DATES TO REMEMBER:

{Start and end date comment period} Public comment period on RI/FS Report, PRAP, and preferred alternative.

{Date and time of public meeting} Public meeting at the **{location and address}**

SECTION 2: SITE LOCATION AND DESCRIPTION

The Franklin Cleaners Site is an inactive dry cleaning facility located at 206-208B South Franklin Street in the Incorporated Village of Hempstead, Nassau County, New York (Figures 1 and 2).

The site is approximately 1/8 acre in size and includes a two story building with residential apartments on the 2nd floor and a coin laundromat and delicatessen occupying the first floor. Portions of the first floor and basement were utilized by the former dry cleaning facility.

The surrounding properties are primarily residential with the exception of South Franklin Street which is mixed residential and small business. The site and surrounding community is serviced by public water and sewers from the Village of Hempstead. The building was connected to the Village sewer system at the time of construction in 1956.

Access to the site is from South Franklin Street. The area immediately adjacent to the building at the site is almost entirely covered with concrete except for portions at the rear of the property. The rear portion of the site was recently fenced.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

According to a building permit from the Village of Hempstead dated February 1957, the building occupancy was a dry cleaning store. Franklin Cleaners began dry cleaning operations during the late 1970s or early 1980s. The current owners purchased the property in April 1987. In 1990, the name of the dry cleaner changed to Grace Cleaners, which operated at the site until 1991. In 1991, dry cleaning operations at the site ceased when the dry cleaner was replaced with a retail clothing store. The clothing store closed approximately 6 months later and the site was subsequently replaced by a succession of delicatessens, the latest of which currently operates at the site. In addition, a laundromat business has been continuously operating at the site since 1987. During the years when a dry cleaner operated at this property, a dry cleaning fluid "cooker", operated in the basement of the building.

In March 1990, the Nassau County Department of Health (NCDOH) investigated a complaint of tainted drinking water from a private residence on Linden Avenue. The residence was found to have two private water supply wells: a drinking water well (approximately 45 feet deep) and an irrigation well (approximately 32 feet deep). The water supply well was sampled and found to contain tetrachloroethene (PCE) at 5,500 ppb. The irrigation well contained PCE at 29,000 ppb. The drinking water and groundwater standard for PCE is 5 ug/1. The residence was connected to the Village of Hempstead public water supply system following the PCE detection.

Since the Franklin Cleaners Site is located upgradient of the wells on Linden Avenue, NCDOH performed an inspection of the dry cleaner premises and collected surface soil samples from the basement of the existing building and at the rear of the former dry cleaner property. Soil samples from the basement were found to contain PCE concentrations as high as 9,400 ppb A sample from the rear of the property contained PCE at 650,000 ppb, trichloroethene (TCE) at 1,700 ppb and dichloroethene (DCE) at 680 ppb.

In 1993, a Preliminary Site Assessment was performed by the Nassau County Department of Public Works (NCDPW). As part of this investigation, four groundwater wells were installed. One of the wells, FC-1, was installed upgradient of the former dry cleaner site to a depth of 40 feet. The other three wells, FC-2, FC-3 and FC-4, were installed downgradient of the site, each to a depth of 37 feet. Groundwater samples collected from the wells showed that monitoring well FC-2 contained PCE at 83 ppb and that none of the contaminants of concern were detected in FC-1, FC-3 and FC-4.

The site was listed on the Registry of Inactive Hazardous Waste Disposal Sites in New York State on June 17, 1993.

SECTION 4: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, the NYSDEC has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

4.1: 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 December 1996 and April 1997. A draft RI was issued in October 1997 and a final RI was issued in February 1998.

The RI included the following activities:

- Private water well survey
- Public water supply well survey
- Facility inspection
- Soil/groundwater probe installation
- Indoor and outdoor surface soil sampling
- Indoor and outdoor subsurface soil sampling
- Groundwater monitoring well construction (including soil sampling)
- Piezometer construction
- Test boring construction and sampling
- Groundwater sampling
- Private well sampling
- Groundwater level measurement
- Indoor and outdoor air sampling
- Surveying
- Upgradient and downgradient survey of other potential source areas

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Franklin Cleaners Site were based on NYSDEC Ambient Water

Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046, Determination of Soil Cleanup Objectives and Cleanup Levels, was used as SCGs for soil.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, SCGs are given for each medium.

4.1.1 Nature and Extent of Contamination:

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

4.1.1.1 Indoor Surface and Subsurface Soil Sampling and Results

Sampling of surface soils in the basement of the former dry cleaners by the Nassau County Department of Health (NCDOH) in 1990 showed elevated levels of PCE. This task was included in the workplan to further delineate contamination in the surface and subsurface soils in that portion of the basement where suspected PCE spills had occurred.

Eighteen interior surface soil samples were collected from a depth of 6 to 12 inches below the surface of the concrete floor. In addition, soil borings were constructed and continuously sampled to a depth of 12 feet below grade. Two samples were selected from each boring. All indoor samples were analyzed for volatile organic compounds (VOCs). The sample locations and the PCE concentrations detected are presented on Figure 3.

Six of the eighteen surface soil samples collected exceeded the soil cleanup objective for PCE with the highest concentration detected at 240,000 ppb. Only one of the subsurface soil samples collected from the interior of the building, from 2 to 3 feet, exhibited levels of VOCs above soil cleanup objectives at 13,000 ppb.

Based on the results of the interior sampling it appears that elevated levels of contamination are found primarily in the vicinity of the former "cooker" and other dry cleaning equipment which was located near the concrete pad in the southeast corner of the basement. The elevated levels found here indicate that PCE spills or disposal occured in this portion of the basement. The basement floor of the building is in poor condition with numerous cracks and broken concrete, which apparently allowed the spilled PCE to migrate to the underlying soil.

The contamination in the vicinity of the "cooker" appears to be limited to the surface soil and shallow subsurface soil at less than 4 feet. Although the surface soil samples exhibited very high levels of PCE, the samples collected with depth, in general, did not exhibit elevated levels of PCE. The area of significant contamination appears to be approximately 450 to 500 square feet.

4.1.1.2 Onsite Surface and Subsurface Soil Sampling and Results

Sampling of surface soils in the rear alley of the former dry cleaners by the NCDOH in 1990 showed elevated levels of PCE. This task was included in the workplan to further delineate contamination in the surface and subsurface soils in this area of the site where suspected PCE spills had occurred.

A total of thirteen surface soil samples were collected along the rear (eastern) portion of the building. Eleven of the samples were collected onsite in the rear of the property, two samples

were collected offsite in the rear of the property One sample was collected in the front of the property (Figure X). Subsurface soil borings were constructed at nine of the surface soil sample locations. The borings were constructed and continuously sampled to a depth of approximately 20 feet below grade. Three samples were selected from each boring. Four samples were also collected from a dry well located at the base of the rear stair case. The samples were collected from the surface to a depth of 10 feet below the surface of the landing. All surface and subsurface soil samples were analyzed for VOCs. Sample locations and associated PCE concentrations are presented on Figure 4.

PCE was detected in four of the surface soil samples at levels above the soil cleanup objective. The highest concentration of PCE detected in the surface soil was 280,000 ppb. This sample also contained trichloroethene (TCE) above the soil cleanup objective at 920 ppb.

Two of the soil borings indicated the presence of elevated levels of PCE with depth. Shallow subsurface samples showed PCE levels as high as 450,000 ppb. Contaminant levels decreased with depth with samples as deep as 12 feet showing PCE levels up to 5,900 ppb, above the soil cleanup objective of 1,400 ppb.

Elevated levels of contamination appear to be limited to an area immediately adjacent to the back door of the former dry cleaning facility. This area is approximately 250-300 square feet.

Based on the subsurface sample results and the significant groundwater contamination associated with this site, as described below, elevated PCE contamination in these soils is likely to be present down to the depth of the water table (approximately 20 feet).

4.1.1.3 Groundwater Sampling and Results

Sampling of shallow groundwater downgradient of the former dry cleaners by the NCDOH in 1990 at a private residence on Linden Avenue showed elevated levels of PCE. This task was included in the workplan to verify the groundwater contaminant source and delineate the extent of groundwater contamination.

Groundwater samples were collected from three different depths during this investigation, utilizing both groundwater probes and groundwater monitoring wells. Groundwater samples were collected from the water table (approximately 20 to 26 feet below grade), from an intermediate depth (33 to 57 feet below grade) and from a deeper depth (49 to 87 feet below grade). All of the samples were collected from the Upper Glacial aquifer, just above a significant clay layer which appears to be present throughout the study area.

Fifty three shallow groundwater samples, fifty two intermediate groundwater samples and fifty two deep groundwater samples were collected from groundwater probes upgradient and downgradient of the Franklin Cleaners Site. Samples were analyzed by the NYSDEC laboratory in Saratoga Springs, New York and by Nytest Environmental, Inc.. All samples were analyzed for VOCs.

Groundwater samples were also collected from seven shallow groundwater monitoring wells (MW-1S, MW-2S, FC-1, FC-2, FC-3, FC-4 and FC-10A), four intermediate monitoring wells (MW-1I, MW-2I, MW-3I and MW-4I) and three deep monitoring wells (MW-1D, MW-3D and MW-4D). In addition, groundwater samples were collected from two shallow domestic wells (6-Lind-1 and Feld-1), one intermediate domestic irrigation well (6-Lind-D) and one deep ~~domestic~~ well (MCOL-1). Each of the samples collected from the monitoring wells and the domestic wells was analyzed for VOCs. Samples were also collected

from the monitoring wells for iron and manganese.

Based on the results of the analysis, the primary compounds that exceeded groundwater standards were PCE, TCE, 1,1-DCE and 1,2-DCE. The primary contaminant detected is PCE. The total VOC concentration for each of the three depth intervals is provided in Figures 5, 6 and 7.

The following provides a description of groundwater results from each of the depth intervals previously described.

Shallow Upper Glacial Aquifer

Elevated levels of PCE were detected in the shallow groundwater in the immediate vicinity of the Franklin Cleaners Site. The highest concentration detected was 1,502 ppb in the well installed onsite. A generalized concentration contour map for shallow groundwater in the vicinity of the site is presented on Figure 5.

The two shallow domestic wells sampled downgradient of the site, 6-Lind-1 and Feld-1, showed PCE at 780 ppb and 100 ppb, respectively.

VOC levels decrease in concentration in the shallow aquifer downgradient (south) of the site to below 5 ppb approximately 3,000 feet downgradient of the site.

Levels of PCE above the groundwater standard were also detected upgradient of the site with the highest concentration detected in the shallow groundwater at 15 ppb. These sporadic exceedances above groundwater standards are likely the result of a source or sources of contamination upgradient of the Franklin Cleaners Site. Additional information on upgradient contamination can be found in the remedial investigation report.

The results of the iron and manganese analysis from the shallow groundwater indicated elevated levels of iron and manganese in two shallow monitoring wells, F10-A and MW-2S. Elevated levels of iron and manganese were also detected in the two shallow domestic wells.

Intermediate Upper Glacial Aquifer

Elevated levels of VOCs were detected further downgradient of the site in the intermediate depth samples collected from the Upper Glacial aquifer. Concentrations of PCE greater than 1,000 ppb were detected approximately 1,000 feet downgradient of the site at groundwater probes P-21 and P-32 and at monitoring well MW-3I. Concentrations greater than 100 ppb were detected at a distance of approximately 3,500 feet downgradient of the site in the intermediate zone. A generalized concentration contour map for the intermediate zone in the vicinity of the site is presented on Figure 6.

In addition to the elevated levels that appear to be a result of contamination migrating from the site, elevated levels of VOCs were also detected cross gradient and to the west of the site in the intermediate depth samples collected from this area. Total VOCs of 954 ppb were detected in the sample collected from groundwater probe P-16 located west of the site. This sample also indicated the highest concentrations of DCE and TCE detected during this investigation. Given the cross gradient relationship of this contamination relative to the Franklin source area and the fact that these compounds are breakdown products of PCE, this may be an indication that the source of this contamination is further upgradient of the site. Concentrations of VOCs greater that 100 ppb were also detected in groundwater probes P-7, P-8 and P-25, northwest of the site. The analyses from these samples and directional relationship to Franklin further indicate that there is likely an upgradient source or sources of contamination. The presence of an upgradient source or sources

of contamination is further supported by the analytical results of the intermediate samples from upgradient groundwater probes. These results are presented in detail in the remedial investigation report.

The results of the iron and manganese analysis from the intermediate zone indicated no iron or manganese above groundwater standards.

Deep Upper Glacial Aquifer

Elevated levels of VOCs were detected in the deep Upper Glacial aquifer both upgradient and downgradient of the site. A generalized concentration contour map for the deep zone in the vicinity of the site is presented in Figure 7. Concentrations in the immediate vicinity of the site in the deep zone exhibited slightly elevated VOC levels up to 72 ppb. Overall, the deep aquifer data indicates a discontinuous plume of highly contaminated groundwater, greater than 1,000 ppb, migrating southerly from the site. Concentrations greater than 100 ppb have been detected in the deep Upper Glacial aquifer as far as 4,500 feet downgradient of the site.

Contaminants found downgradient in the deep Upper Glacial aquifer may be somewhat influenced by contamination from an upgradient source or sources migrating towards the Franklin site. Concentrations greater than 900 ppb have been detected in the deep samples collected 1,500 feet upgradient of the site, further confirming the presence of an upgradient source or sources of contamination.

The results of the iron and manganese analysis from the deep zone indicated no iron or manganese above groundwater standards.

General Groundwater Observations

The groundwater plume which emanates from the Franklin Site can be traced from this former dry cleaners, nearly one mile downgradient (south) of the Site where it ends on the northern boundary of the Malloy College property, just south of the Southern State Parkway. The width of the plume remains narrow throughout its length, generally less than 400 feet. In comparing the contaminant levels in the shallow, intermediate and deep Upper Glacial aquifer, it is apparent that contamination migrates downward as it travels away from the site. Due to the presence of a low permeability unit at the interface of the Upper Glacial and Magothy aquifers, it is unlikely that significant contamination associated with the Franklin Cleaners Site has migrated into the Magothy aquifer.

4.1.1.4 Ambient Air Sampling and Results

Air data collected from the building which included the former Franklin Dry Cleaners and the adjacent building to the south showed PCE levels in exceedence of the NYSDOH proposed ambient air guidance value for residential air quality for PCE of 100 ug/m3. This value is based on an assumed continuous lifetime exposure. It is used for "screening" purposes to evaluate the need for further investigation or whether additional consideration is warranted. NYSDOH has not proposed a short-term value. Also, the draft document includes an "action level" guidance value of 1,000 ug/m3 which, if exceeded, would indicate to NYSDOH that immediate action be taken to reduce public exposure.

Levels in the basement of these two buildings were found to have PCE levels as high as 6000 ug/m3. First floor samples were as high as 1300 ug/m3 and second floor samples up to 480 ug/m3.

Analysis of samples collected from residences adjacent to the former Cleaners showed levels of PCE which were below the NYSDOH proposed ambient air guidance value.

4.1.1.5 Public and Private Water Supplies

Public Water Supply Well Survey

A public water supply survey was conducted to identify public water supply wells in the vicinity of the Franklin Cleaners Site. The survey was conducted by placing inquiries with NCDPW, NCDOH, NYSDEC and United States Geological Survey (USGS). The locations of the public water supply wells are presented on Figure 8.

The nearest public water supply wells to the site are wells N-3668 and N-8264. These wells, which are operated by the Village of Hempstead, are located 700 feet west-southwest of the site. Well N-3668 is 500 feet deep and N-8264 is 510 feet deep. Both of these wells have been routinely tested for volatile organic chemicals (including PCE and TCE) by the Village and the NCDOH since 1978 when such testing was first initiated in New York State. To date, no volatile organic chemical has been detected in either well above New York State drinking water standards.

Additional water supply wells are located just south of the leading edge of the contaminant plume, southeast of the Malloy College property. These wells, N-0072, N-3745 and N-8218, while in the flow path of the plume, produce water from the Magothy formation at depths ranging from 400 to 600 feet. These wells are not impacted by contamination and are unlikely to be threatened by the contaminant plume from Franklin.

Private Well Survey

A private well survey was conducted to identify private wells in the vicinity of the Franklin Cleaners Site and areas downgradient of the groundwater plume emanating from the site. The survey was conducted by reviewing historical information compiled by the Nassau County Department of Health (NCDOH), to determine the locations of private wells in the immediate area of the site. Inquiries were also made to the NYSDEC and local water districts (Village of Hempstead Water District, Long Island Water Corporation and the Village of Rockville Centre Water Department) for listings of private wells in the area of and downgradient of the plume. Based upon the information received, 43 private wells were identified. All of the private wells that were identified are located in the Village of Rockville Centre, downgradient of the groundwater plume and are serviced by public water. However, unrestricted use of the shallow, Upper Glacial aquifer may occur.

4.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

An IRM was conducted in January 1998 to address the elevated levels of PCE found in the ambient air samples collected in the basement of the former dry cleaners as well as in air samples collected on the first and second floors of the Franklin property.

Fans with integrated particulate and granular activated carbon (GAC) filters, designed to recirculate and filter air to remove dust and VOCs, were installed in the basement of the former dry cleaner. A wall was constructed to isolate the portion of the basement where the cooker for the dry cleaner was located and where the elevated PCE levels were found in soils beneath the basement floor. In addition. the fans were vented to the outside to insure continued air flow into this portion of the basement, thus minimizing the potential for contaminated vapors to move into other parts of the building.

Follow-up air sampling will be conducted periodically to monitor the effectiveness of the IRM. In addition, a similar IRM will be conducted in the structure adjacent to Franklin Cleaners to the south to address this contamination.

4.3 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 health risks can be found in the Exposure Assessment which is part of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

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

- Direct contact (ingestion, inhalation and dermal absorption) with contaminated onsite soils; and
- direct contact (ingestion, inhalation and dermal absorption) with contaminated groundwater through residential or commercial use.

The potential human exposure pathways at Franklin include: 1) the potential for unrestricted use of the Upper Glacial aquifer downgradient and in the pathway of the contaminant plume where several private wells exist and 2) exposure to onsite contaminated soils and indoor air. These pathways will be addressed through the proposed remedial actions presented in this PRAP.

4.4 Summary of Environmental Exposure Pathways:

No pathways for environmental exposure have been identified for this site.

SECTION 5: 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 Potential Responsible Parties (PRP) for the site, documented to date, include:

Ms. Incoronata Perna , Owner
Mr. Guiseppe Sperduto, Owner

The PRPs failed to implement the RI/FS at the site when requested by the NYSDEC. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the NYSDEC will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State has incurred.

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. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles. The goals selected for this site are:

- Reduce, control, or eliminate contaminated media to the extent practicable.

- Eliminate the threat to groundwater and indoor air by eliminating onsite soil contamination.

- Eliminate the potential for human exposure to the onsite contaminated soils.

- Eliminate the potential for exposure to contaminated groundwater.

- Provide for attainment of SCGs for groundwater, soil and indoor air to the limits of the affected area, to the extent practicable.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Franklin Cleaners Site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Remedial Investigation/ Feasibility Study Report, Franklin Cleaners Site" dated January 1998.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Alternatives

The potential remedies are intended to achieve the established remedial goals for the contaminated media identified including VOC-contaminated onsite soils and VOC-contaminated onsite and offsite groundwater.

Alternative 1 No Action

Present Worth:	$ 253,000
Capital Cost:	$28,000
Annual O&M:	$ 14,637
Time to Implement	3 to 6 months

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.

Under the no action alternative, no measures would be taken to remove or contain the soil or groundwater contamination. However, this alternative presumes that long-term monitoring of indoor air and groundwater would be implemented and access and use restrictions would be maintained.

Alternative 2 Onsite Soil Vapor Extraction and Air Sparging and Offsite Groundwater Extraction and Treatment

Present Worth:	$ 2,254,000
Capital Cost:	$ 842,000
Total Present Worth O&M:	$ 1,412,000
Time to Implement	1 to 11/2 years

Under Alternative 2, surface and subsurface soil contamination on the site would be remediated using soil vapor extraction (SVE) and onsite groundwater would be remediated by air sparging combined with SVE. Contamination in offsite groundwater would be addressed by extraction

and treatment of groundwater. This alternative also includes long-term monitoring of indoor air and groundwater and use restrictions would be maintained for groundwater in the vicinity of the contaminant plume.

Within the contaminated soils above the water table, present at the Site at an approximate depth of 20 feet, a series of SVE wells would be installed both outside and inside the building of the former Franklin Dry Cleaners in areas where significant concentrations of perchloroethylene (PCE), tetrachloroethylene (TCE) and 1,2-dichloroethylene (DCE) have been detected (Figure X). These wells are screened within the contaminated soils. Soil vapors containing volatile organic compounds (VOCs) would be extracted from the soil by an above ground vacuum system. The contaminated vapors would be treated by a granular activated carbon (GAC) system. A low permeability cover (asphalt and/or concrete) would be placed over the affected soils during the operation of this system to enhance the system's effect by controlling vapor emissions to the atmosphere. This cover would also limit possible exposure to vapors via direct contact or inhalation during construction of this alternative.

The equipment required for SVE includes extraction wells, a vacuum unit/blower, liquid/vapor separator, vapor treatment unit consisting of GAC canisters and the system controls and instrumentation. The number of wells required would be function of the subsurface geologic conditions and extent of contamination. The spent GAC canisters would be shipped offsite to a facility which would regenerate the carbon for reuse.

Air sparging would involve the injection of air into the contaminated, shallow groundwater of the underlying aquifer. This process would release contaminants to the overlying unsaturated soils while promoting biodegradation in the saturated and unsaturated soils through the increase of subsurface oxygen concentrations. Volatilized vapors which migrate to the unsaturated soils above would be captured by the SVE system. The components of an air sparging system include an oil-free compressor, air sparging injection wells and associated SVE components.

The performance of the SVE/air sparging system would be monitored using groundwater monitoring wells and soil vapor probes. The remediation is expected to take 3 years.

The offsite remedial technology under Alternative 2 includes extraction and treatment of contaminated groundwater at the leading edge of the plume, approximately 4200 feet downgradient of the Franklin Cleaners Site. An additional technology, in-well air stripping, was evaluated as a potentially viable technology to address offsite groundwater contamination. This innovative technology uses non-conventional extraction wells designed to strip VOCs within the well and reinject treated water back into the aquifer, eliminating the need for aboveground water treatment. This technology was screened out from consideration for the following reasons:

- This technology has limitations on its ability to reduce contaminant levels in the groundwater with reductions of 50% to 99% reported, allowing potentially untreated groundwater to be reinjected into uncontaminated portions of the aquifer;

- pumping and reinjection within the same well would limit control of the contaminant plume, allowing it to bypass these wells more readily than a conventional pump and treatment system; and

- injection of air into the well would promote fouling of the well screen and aquifer through iron oxidation and

bacteria buildup, resulting in higher operation and maintenance costs.

Under Alternative 2, an extraction well(s) would be installed where the leading edge of the contaminant plume intersects the Malloy College property, just south of the Southern State Parkway (Figure 9). PCE levels in this area of the plume are estimated to be 150 to 200 ppb. Consideration was given to intercepting the plume further upgradient where contaminant levels are slightly higher, however, logistical considerations prohibit the siting of a pump and treat system further north of the proposed location due to the dense residential development in this area.

Contaminated groundwater would flow through a treatment train consisting of metals removal (primarily iron) and air stripping to remove VOCs including PCE, TCE and DCE. Off-gasses would be treated, if required, using a vapor phase GAC filter before discharge to the atmosphere. Pre-treatment metals residuals would be disposed of offsite and the treated groundwater would likely be discharged to either a storm sewer or leaching pools.

It is anticipated that contaminated groundwater would be pumped from one well at the leading edge of the plume at a rate of approximately 50 gallons per minute. The pretreatment process for metals removal would utilize chemical precipitation and pH adjustment combined with filtering. A pretreatment step is necessary to prevent fouling of the air stripper by metals which naturally exist in the groundwater. The vapor phase GAC filters would be designed for regeneration. The operation time for extraction and treatment is expected to be 20 years.

Alternative 2 presumes that long-term monitoring of indoor air and groundwater would be implemented and groundwater use restrictions would be maintained.

<u>Alternative 3</u> Onsite Soil Vapor Extraction and Air Sparging and Natural Attenuation of Offsite Groundwater

Present Worth:	$ 566,000
Capital Cost:	$ 238,000
Total Present Worth O&M:	$ 328,000
Time to Implement	6 months to 1 year

Alternative 3 has all of the same onsite components as Alternative 2 including SVE and air sparging. This alternative, however, includes no active remediation for contaminated offsite groundwater, allowing natural attenuation to take place.

Natural attenuation includes a series of natural subsurface processes which reduce contaminant concentrations in the groundwater. These processes include dilution, dispersion, volatilization, biodegradation, adsorption and chemical reactions. Consideration of this option requires groundwater modeling and evaluation of contaminant degradation rates to determine feasibility. Special regulatory approvals may be needed. This alternative would also require a long-term, comprehensive groundwater sampling and analysis program to confirm that attenuation is proceeding at rates predicted and is consistent with the groundwater cleanup objectives. Impacts to potential receptors are of primary concern.

Alternative 3 presumes that long-term monitoring of indoor air and groundwater would be implemented and groundwater use restrictions would be maintained.

7.2 <u>Evaluation of Remedial Alternatives</u>

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the

alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The no action alternative is unacceptable as it does not address the remedial action objectives for this Site. Specifically, since PCE in the onsite soils would be neither removed or controlled, contamination could continue to impact groundwater and indoor air. In addition, contamination in groundwater would not be removed or contained, allowing the potential for further degradation of groundwater and impacts to downgradient public or private water supplies. Further, access and use restrictions would not necessarily be implemented. However, this alternative presumes that long-term monitoring of groundwater and indoor air would be implemented. Use of groundwater in the area of the plume would also be restricted.

Alternatives 2 and 3 would achieve compliance for all SCGs for onsite soil contamination while eliminating or minimizing impacts to the underlying groundwater. Alternative 2 would remove contamination in the groundwater to the extent practicable through the use of well proven technologies: air sparging for onsite groundwater and extraction and treatment for offsite groundwater. Alternative 3 includes natural attenuation for offsite groundwater. Since offsite groundwater would not be addressed under this alternative, compliance for these SCGs would not be achieved.

All three alternatives would include long-term monitoring of the groundwater contaminant plume and indoor air. Use of groundwater in the area of the plume would be restricted.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The no action alternative would not be protective of the environment and human health as the potential to be exposed to onsite contamination would remain. In addition, this alternative would not address the potential for further impacts to groundwater nor would it provide for removal or control of contaminated groundwater, allowing the potential for migration of the contaminant plume further downgradient where numerous private water wells have been identified. However, this alternative presumes that long-term monitoring of groundwater and indoor air would be implemented. Use of groundwater in the area of the plume would also be restricted.

Alternatives 2 and 3 would be protective of human health and the environment with respect to the onsite contamination through removal of the onsite source and eliminating or minimizing further impacts to the underlying groundwater. In addition, onsite contaminated groundwater would be addressed through air sparging, a proven technology. Alternative 2 includes offsite extraction and treatment, also a conventional technology which is well proven. However, Alternative 3 includes no offsite treatment technology and therefore would not be effective in eliminating or minimizing the potential for impacts to human health or the environment. As in the no action alternative, the potential for migration of the contaminant plume further downgradient where numerous private water wells have been identified would still exist.

All of the alternatives would include monitoring of indoor air and groundwater as well as

restricting groundwater use in the vicinity of the plume.

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.

Since there are no actions proposed for Alternative 1, there are no short-term effects associated with this alternative.

Alternatives 2 and 3 include design and construction of soil and groundwater contamination recovery systems. Implementation of these alternatives pose very limited short-term effects or disruptions to the community during the following work: well drilling, construction of a groundwater treatment system and construction of a SVE recovery and treatment system. The small amount of contaminated groundwater and soil that are generated during construction can be safely handled and disposed of offsite.

The potential short-term effects from air emissions posed by construction of the SVE system under Alternatives 2 and 3 can be mitigated by personnel protection measures or by controlling dust.

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 controls intended to limit the risk, and 3) the reliability of these controls.

The no action alternative would not be effective in the long term. The onsite contamination would not be removed or contained and additional measures to ensure that the overlying soil is not disturbed would not be implemented. This alternative would not reduce any existing or future potential risks from the onsite contamination. In addition, this alternative would not address the potential for further impacts to groundwater nor would it provide for removal or control of contaminated groundwater. However, this alternative presumes that long-term monitoring of groundwater and indoor air would be implemented. Use of groundwater in the area of the plume would also be restricted.

Alternatives 2 and 3 rely on removal of PCE from the onsite soils through SVE and removal of PCE from onsite contaminated groundwater using air sparging, capture of PCE using vapor phase CAC filters and offsite incineration of the waste carbon material. Incineration would permanently destroy all organic compounds in the carbon (primarily PCE) and is the most effective long-term approach to organic contamination. In addition, source removal would eliminate or minimize impacts to the underlying groundwater. Alternative 2 includes offsite capture of PCE and associated breakdown products using a vapor phase GAC treatment system and offsite incineration of spent carbon. As such, this alternatives would provide an adequate and effective level of protection over the long term. Alternative 3 would provide no such level of protection for offsite groundwater.

All of the alternatives would include monitoring of indoor air and groundwater as well as restricting groundwater use in the vicinity of the plume.

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.

The no action alternative would not reduce the toxicity, mobility or volume of the waste.

Alternatives 2 and 3 include removal and offsite incineration of PCE recovered from onsite SVE and air sparging, significantly reducing the toxicity, mobility and volume of this waste. Alternative 2 would be similarly effective for offsite contaminated groundwater by removing PCE using a GAC treatment system and incinerating the waste carbon offsite. Alternative 3 would not reduce the toxicity, mobility or volume of contamination in the offsite groundwater. Because a destruction, treatment or immobilization technology is not being employed for offsite groundwater under this alternative, this alternative is not as effective for this screening criteria relative to Alternatives 2.

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

All of the alternatives are implementable. The material and personnel for each alternative should be readily available at a reasonable cost in this region.

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

The no action alternative is the least costly alternative. This alternative has no capital costs associated with it and includes only the cost for long-term sampling and analysis of existing monitoring wells and indoor air.

Alternative 2 and 3 have a similar cost with respect to on site activities as both include SVE of onsite soils and air sparging of onsite groundwater. However, Alternative 2 is considerably higher in cost due to offsite extraction and treatment of contaminated groundwater.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon 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 Proposed Remedial Action Plan are evaluated. A " Responsiveness Summary" will be prepared that describes public comments received and how the Department will address the concerns raised. If the final remedy selected 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 PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 2, Onsite Soil Vapor Extraction and Air Sparging and Offsite Extraction and Treatment as the remedy for this site.

Alternative 2 is being proposed because it is the most cost effective remedial action which will address the remedial objectives for this site. Specifically, PCE would be eliminated from

onsite soils and onsite and offsite groundwater to the extent practicable through the use of well proven technologies. Recovered PCE would be destroyed using offsite incineration. While Alternatives 2 and 3 would achieve the same objective for onsite contamination in soils and groundwater, Alternative 3 would not remove any contamination in the offsite groundwater and, as a result, would not address the remedial objectives for this contaminated media. Under this alternative, the potential for migration of the contaminant plume further downgradient where numerous private water wells have been identified would still exist. In addition, this alternative has some serious drawbacks with respect to several of the screening criteria including compliance with New York State Standards, Criteria and Guidance, protection of human health and the environment, long-term effectiveness and permanence and reduction of toxicity, mobility or volume.

The estimated present worth cost to implement the remedy is $2,254,000. The cost to construct the remedy is estimated to be $842,000 and the estimated average annual operation and maintenance cost for 30 years is $91,850.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved;

2. Soil vapor extraction (SVE) of PCE-contaminated soils onsite treatment of contaminated vapors using a vapor phase granular activated carbon (GAC) treatment system;

3. Air sparging of shallow onsite groundwater and capture of PCE vapors by the proposed SVE system;

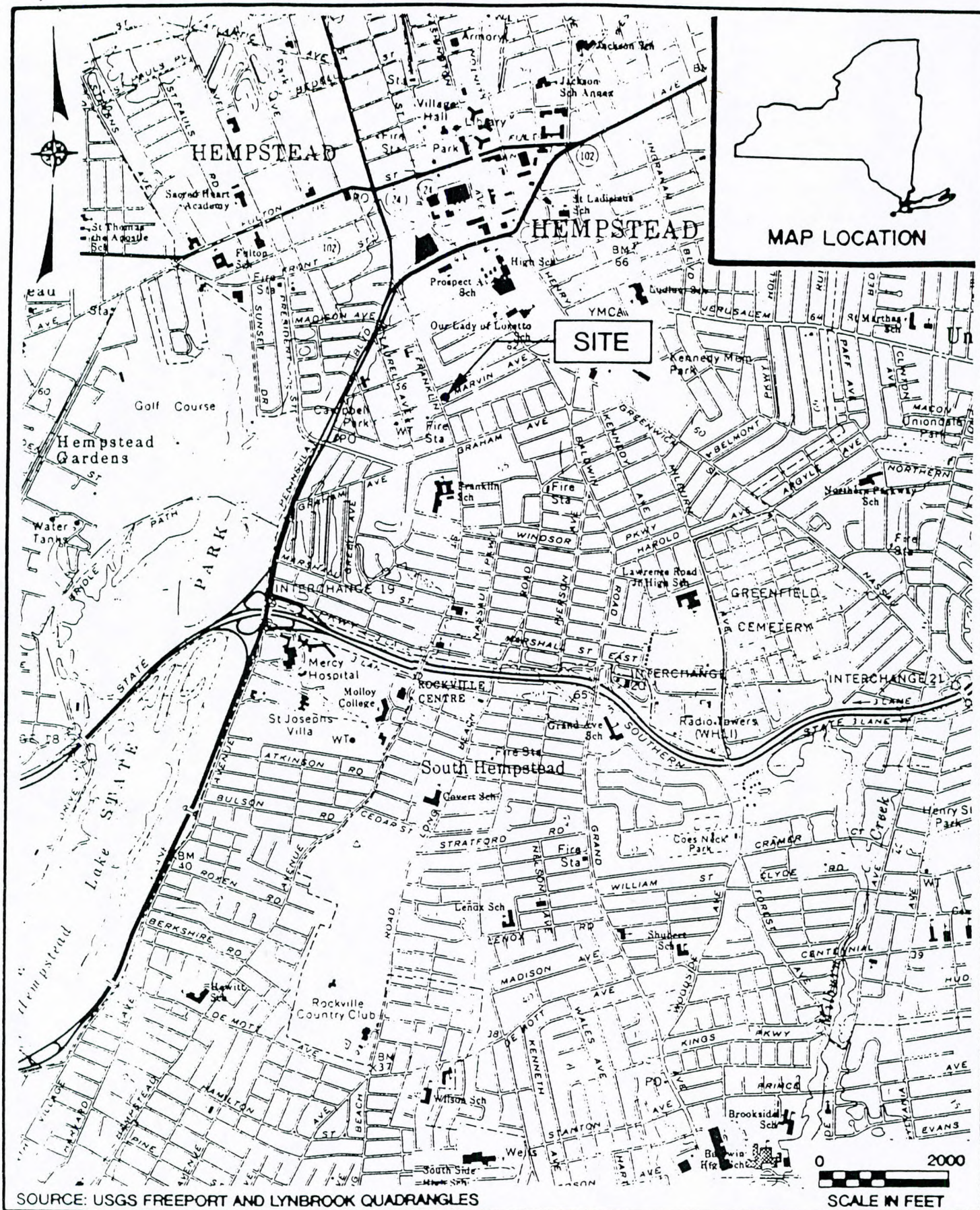
4. Extraction of contaminated groundwater at the leading edge of the contaminant plume and treatment of water through the use of chemical precipitation and filtering of metals, air stripping of VOCs along with GAC treatment of off gasses, if necessary;

5. Offsite disposal of all spent carbon at a TSCA and RCRA-permitted incinerator;

6. Long-term groundwater and indoor air monitoring; and

7. Groundwater use restrictions.

Since the remedy results in untreated hazardous waste remaining both onsite and offsite, a long term monitoring program would be instituted. This program would allow the effectiveness of the selected remedy to be monitored and would be a component of the operation and maintenance for the site.



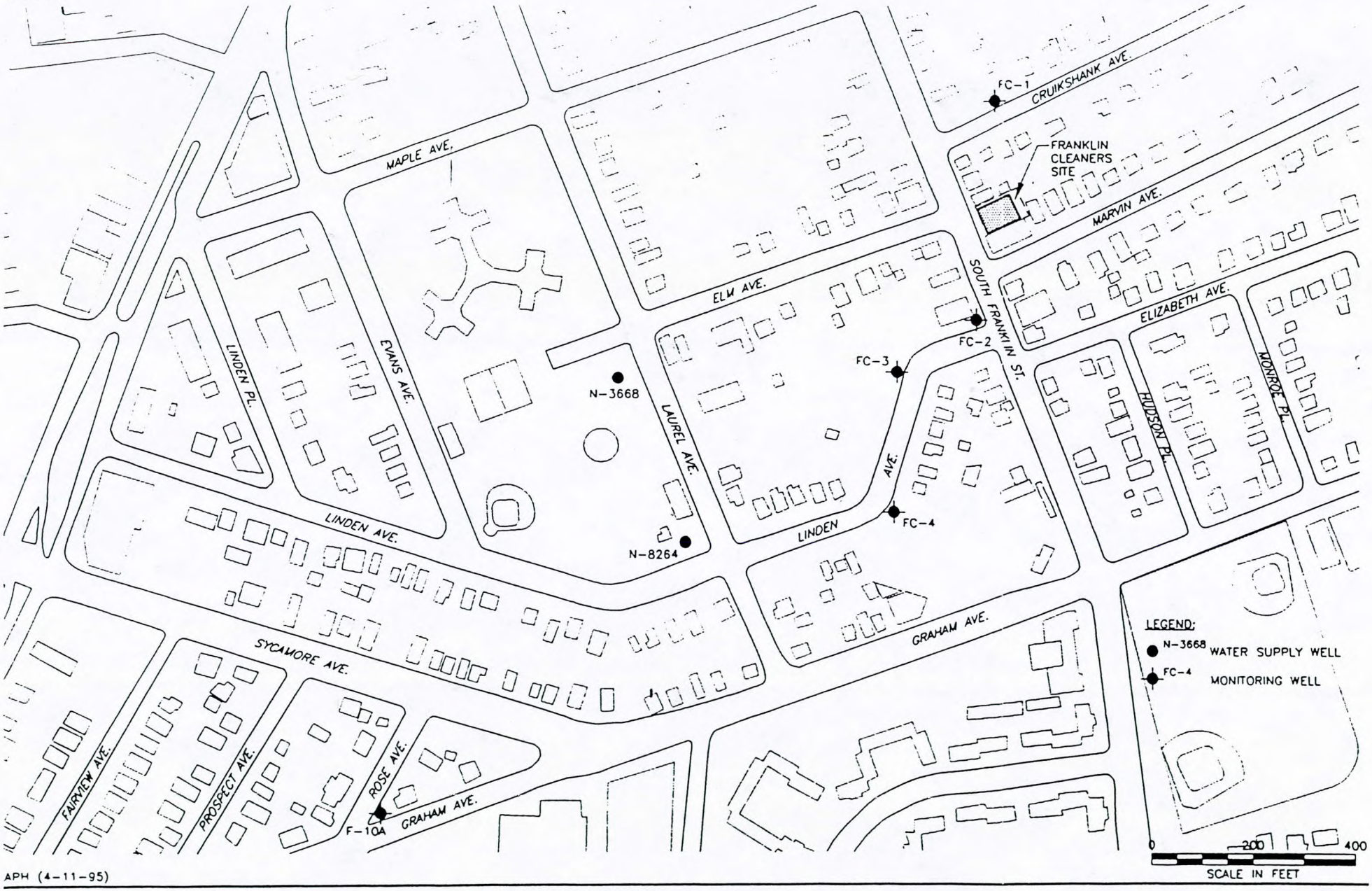
SOURCE: USGS FREEPORT AND LYNBROOK QUADRANGLES

FRANKLIN CLEANERS SITE
HEMPSTEAD, NEW YORK

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1



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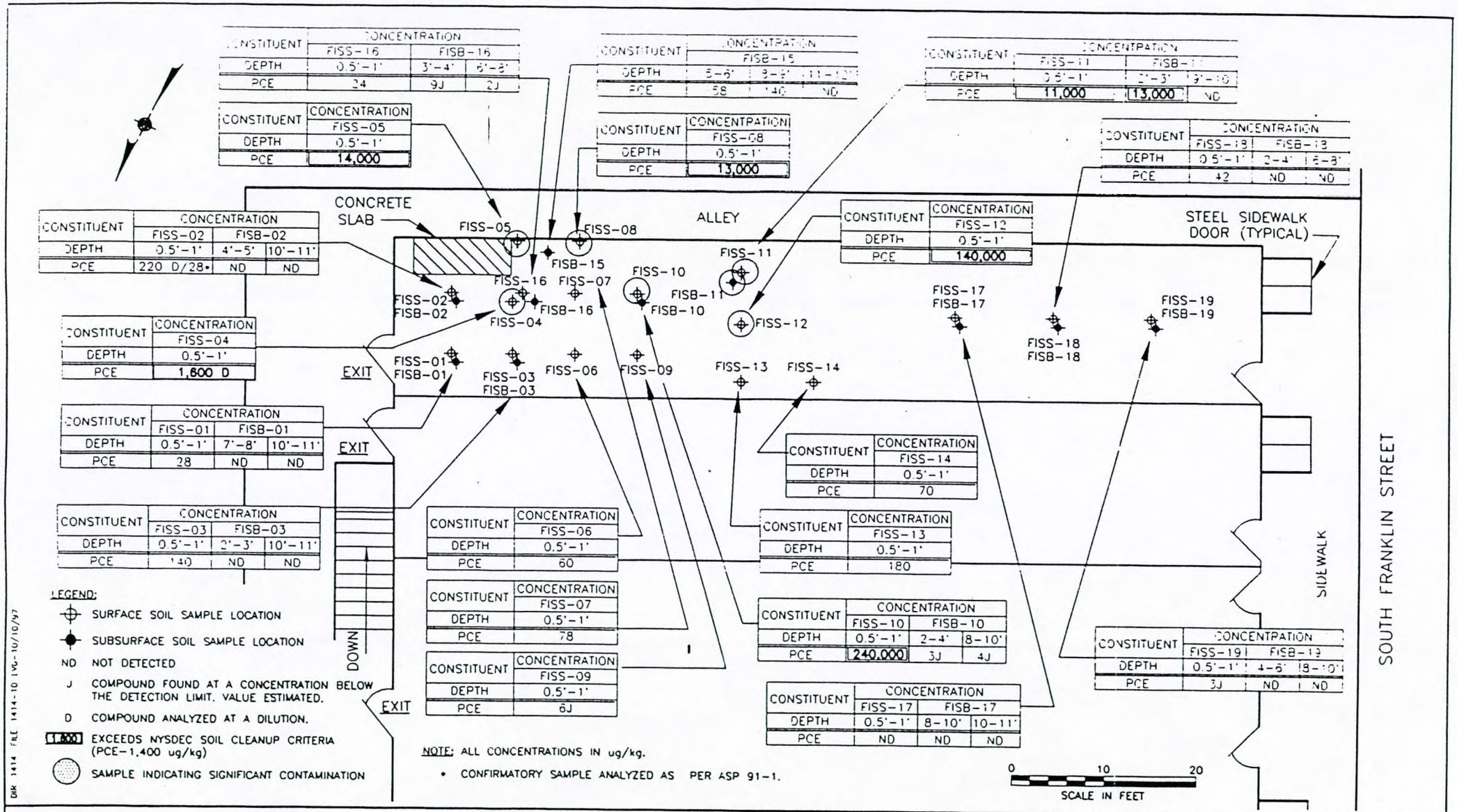
FRANKLIN CLEANERS SITE
HEMPSTEAD, NEW YORK

SITE AND STUDY AREA MAP

FIGURE 2



CONSTITUENT	CONCENTRATION		
	FISS-16	FISB-16	
DEPTH	0.5'-1'	3'-4'	6'-8'
PCE	24	9J	2J

CONSTITUENT	CONCENTRATION		
	FISB-15		
DEPTH	5'-6'	9'-9'	11'-12'
PCE	58	140	ND

CONSTITUENT	CONCENTRATION		
	FISS-11	FISB-11	
DEPTH	0.5'-1'	2'-3'	9'-10'
PCE	11,000	13,000	ND

CONSTITUENT	CONCENTRATION
	FISS-05
DEPTH	0.5'-1'
PCE	14,000

CONSTITUENT	CONCENTRATION
	FISS-08
DEPTH	0.5'-1'
PCE	13,000

CONSTITUENT	CONCENTRATION		
	FISS-18	FISB-18	
DEPTH	0.5'-1'	2'-4'	6'-8'
PCE	42	ND	ND

CONSTITUENT	CONCENTRATION		
	FISS-02	FISB-02	
DEPTH	0.5'-1'	4'-5'	10'-11'
PCE	220 D/28•	ND	ND

CONSTITUENT	CONCENTRATION
	FISS-12
DEPTH	0.5'-1'
PCE	140,000

CONSTITUENT	CONCENTRATION
	FISS-04
DEPTH	0.5'-1'
PCE	1,600 D

CONSTITUENT	CONCENTRATION		
	FISS-01	FISB-01	
DEPTH	0.5'-1'	7'-8'	10'-11'
PCE	28	ND	ND

CONSTITUENT	CONCENTRATION
	FISS-14
DEPTH	0.5'-1'
PCE	70

CONSTITUENT	CONCENTRATION		
	FISS-03	FISB-03	
DEPTH	0.5'-1'	2'-3'	10'-11'
PCE	140	ND	ND

CONSTITUENT	CONCENTRATION
	FISS-06
DEPTH	0.5'-1'
PCE	60

CONSTITUENT	CONCENTRATION
	FISS-13
DEPTH	0.5'-1'
PCE	180

CONSTITUENT	CONCENTRATION
	FISS-07
DEPTH	0.5'-1'
PCE	78

CONSTITUENT	CONCENTRATION		
	FISS-10	FISB-10	
DEPTH	0.5'-1'	2-4'	8-10'
PCE	240,000	3J	4J

CONSTITUENT	CONCENTRATION
	FISS-09
DEPTH	0.5'-1'
PCE	6J

CONSTITUENT	CONCENTRATION		
	FISS-19	FISB-19	
DEPTH	0.5'-1'	4-6'	8-10'
PCE	3J	ND	ND

CONSTITUENT	CONCENTRATION		
	FISS-17	FISB-17	
DEPTH	0.5'-1'	8-10'	10-11'
PCE	ND	ND	ND

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FRANKLIN CLEANERS SITE
HEMPSTEAD, NEW YORK

Dvirka and Bartilucci
Consulting Engineers
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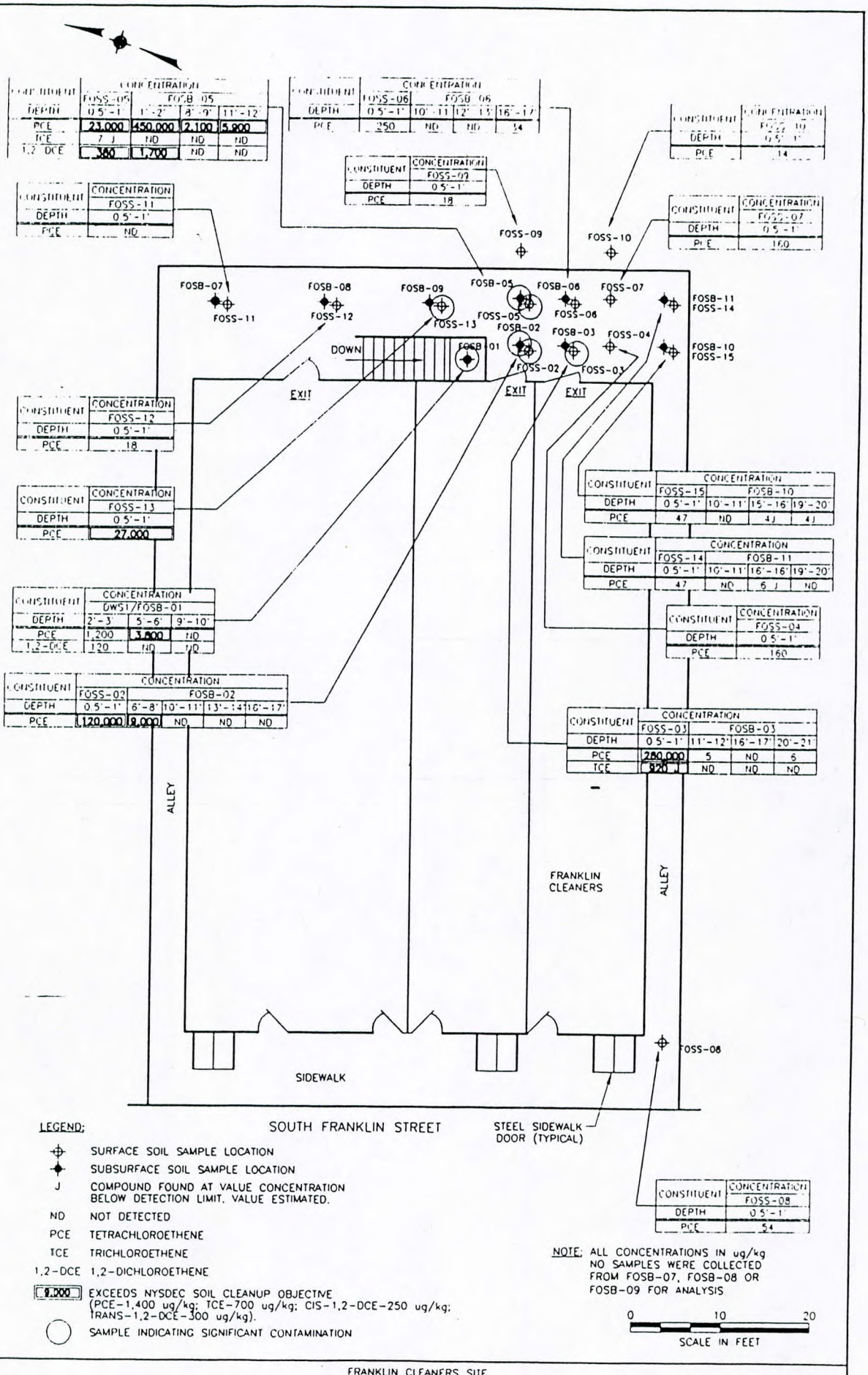
INTERIOR SURFACE AND SUBSURFACE SOIL SAMPLE LOCATIONS AND RESULTS

FIGURE 3



FRANKLIN CLEANERS SITE
HEMPSTEAD, NEW YORK

EXTERIOR SURFACE AND SUBSURFACE SOIL SAMPLE LOCATIONS AND RESULTS

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 4

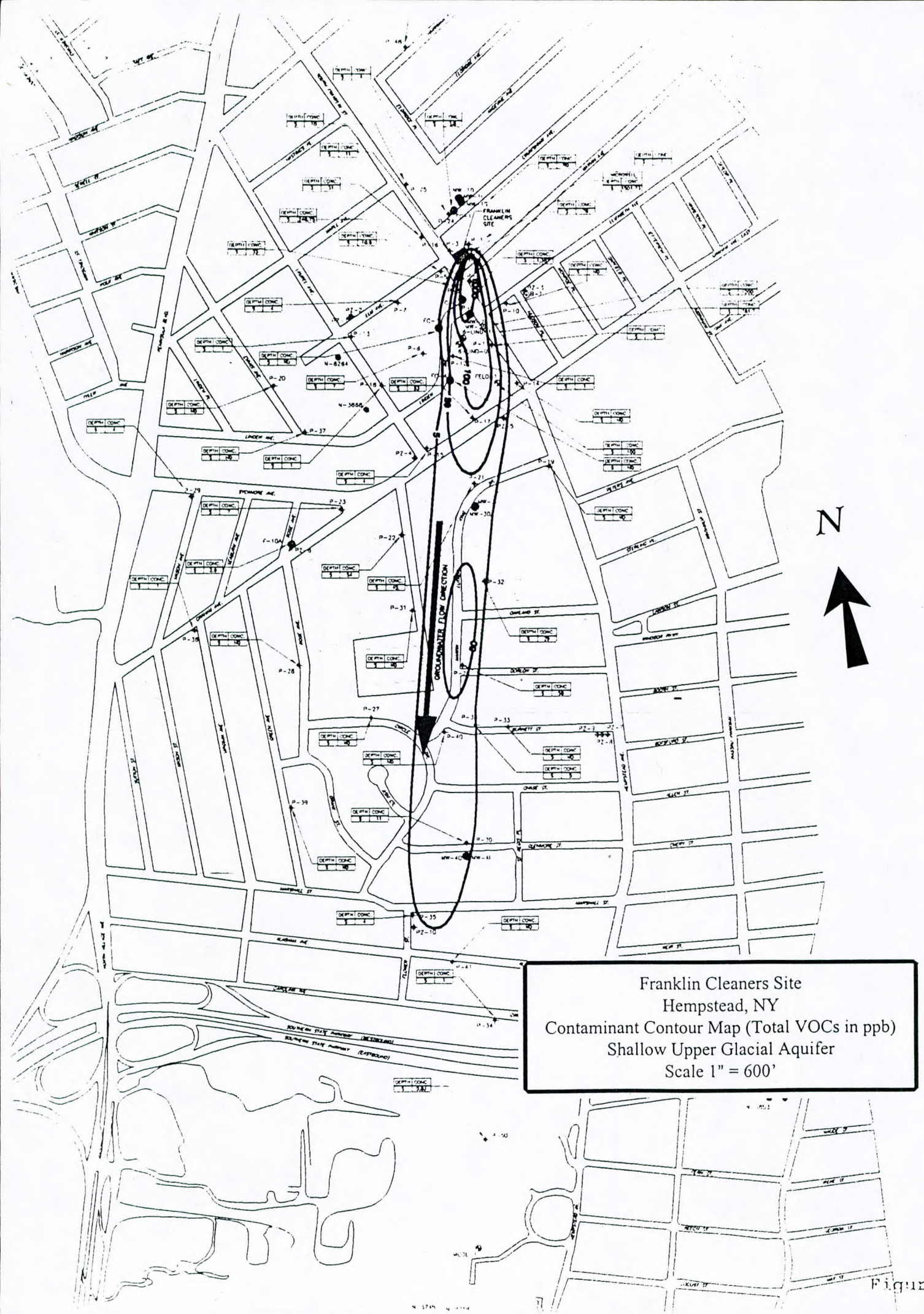
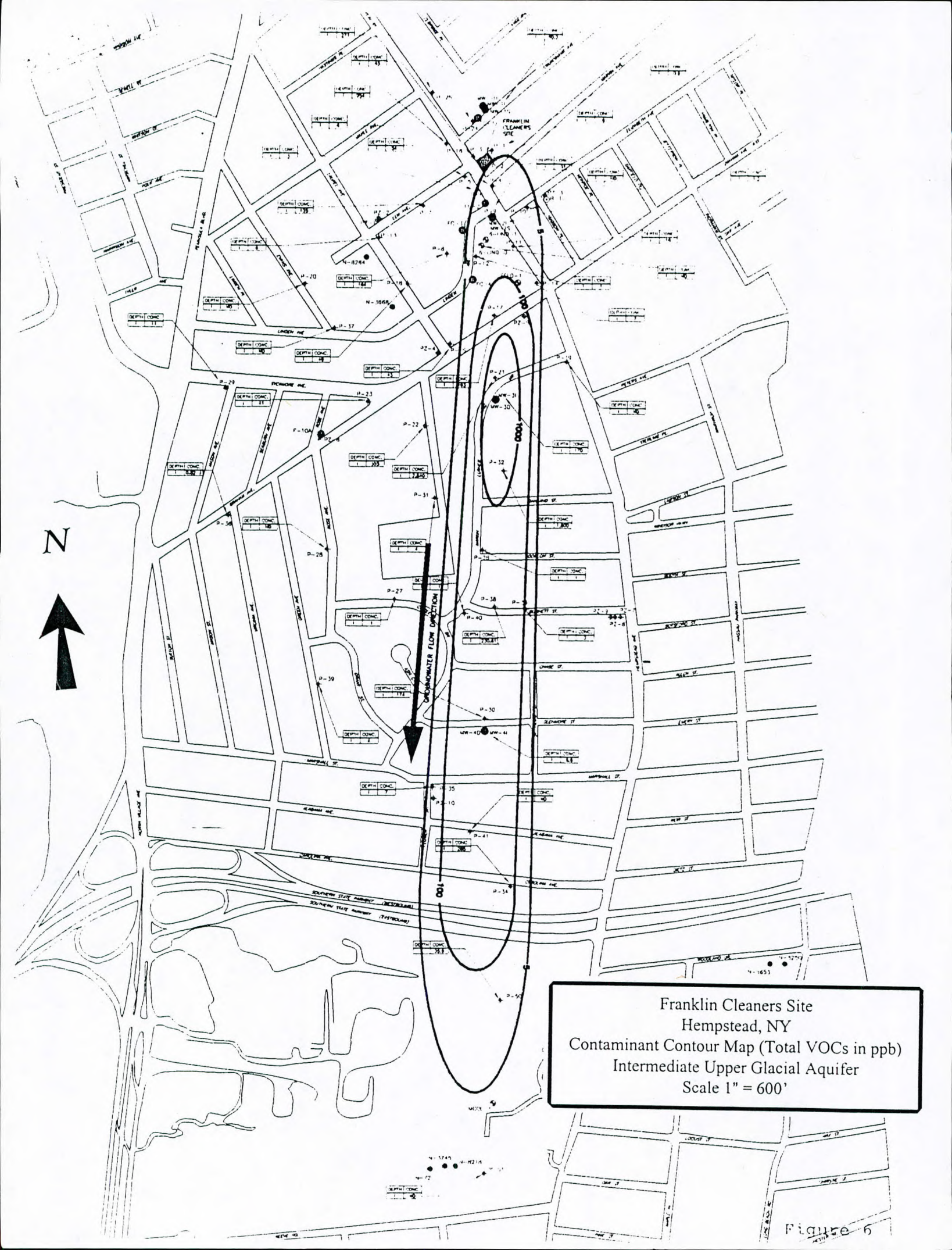
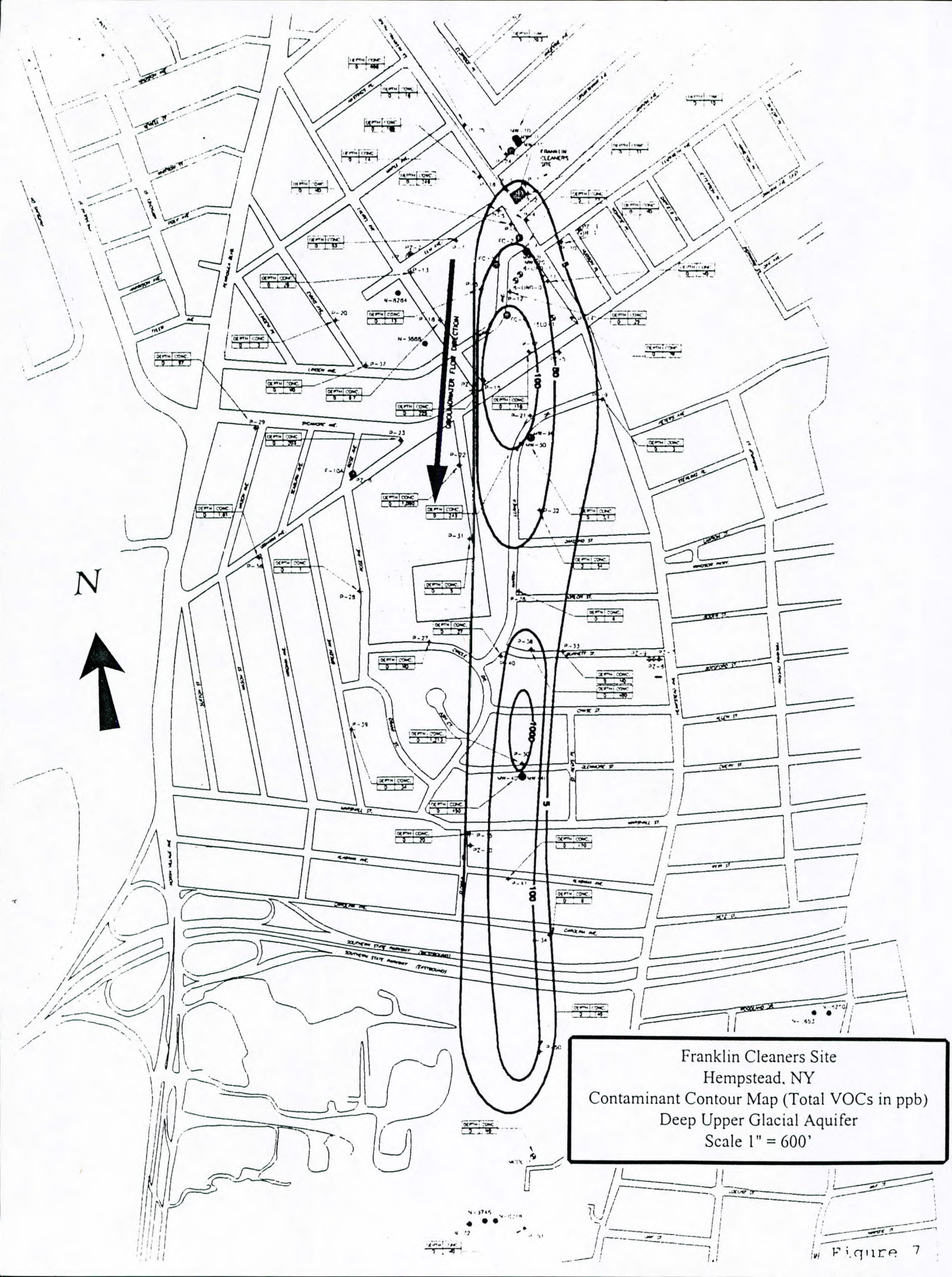

FRANKLIN CLEANERS SITE
GROUNDWATER FLOW DIRECTION
N
Franklin Cleaners Site
Hempstead, NY
Contaminant Contour Map (Total VOCs in ppb)
Shallow Upper Glacial Aquifer
Scale 1" = 600'

Figure 5



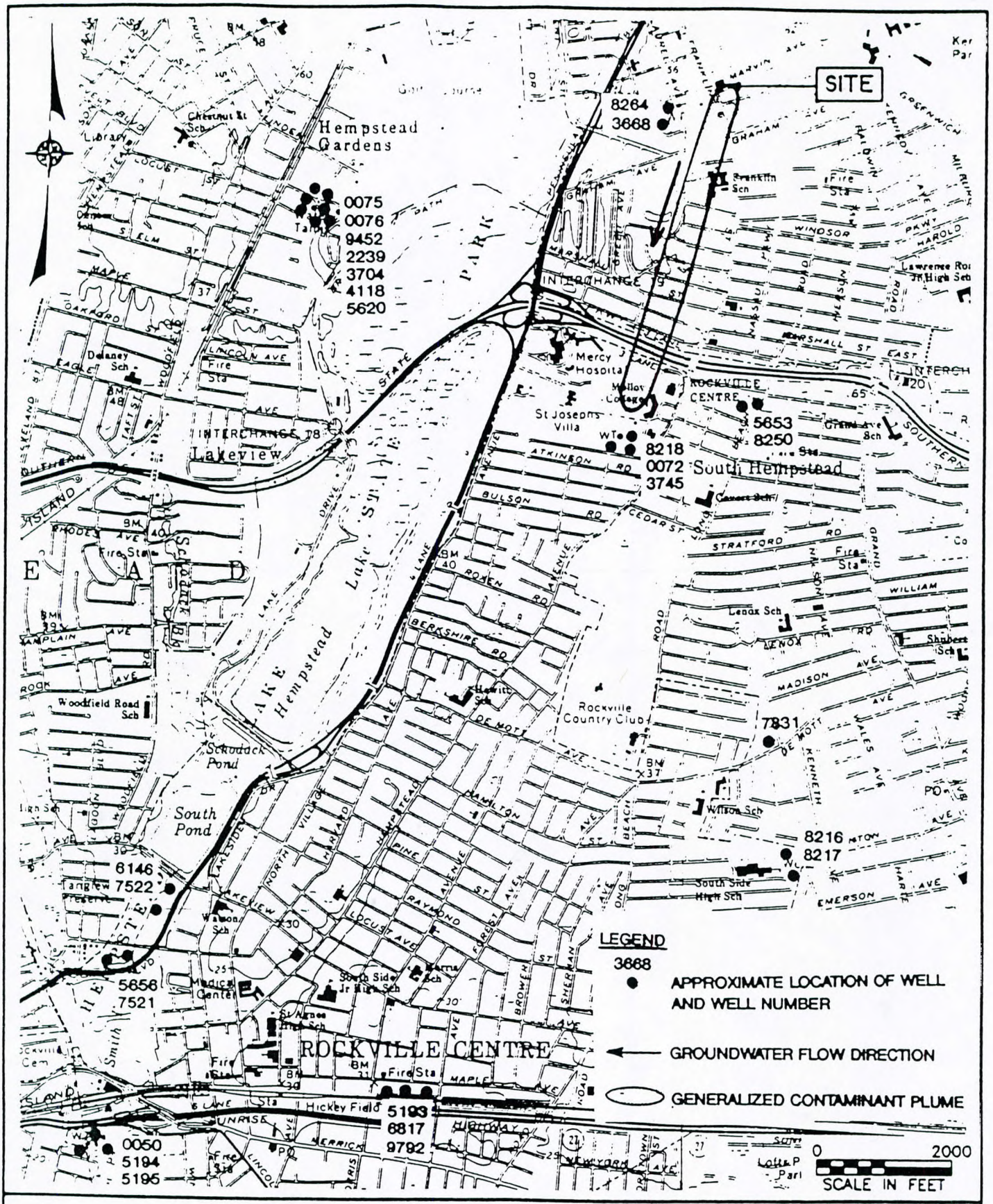
Franklin Cleaners Site
Hempstead, NY
Contaminant Contour Map (Total VOCs in ppb)
Intermediate Upper Glacial Aquifer
Scale 1" = 600'

Figure 6



Franklin Cleaners Site
Hempstead, NY
Contaminant Contour Map (Total VOCs in ppb)
Deep Upper Glacial Aquifer
Scale 1" = 600'

Figure 7



FRANKLIN CLEANERS SITE
HEMPSTEAD, NEW YORK

PUBLIC WATER SUPPLY WELLS LOCATED DOWNGRADIENT AND IN PROXIMITY OF CONTAMINANT PLUME

FIGURE 8

Dvirka and Bartilucci Consulting Engineers
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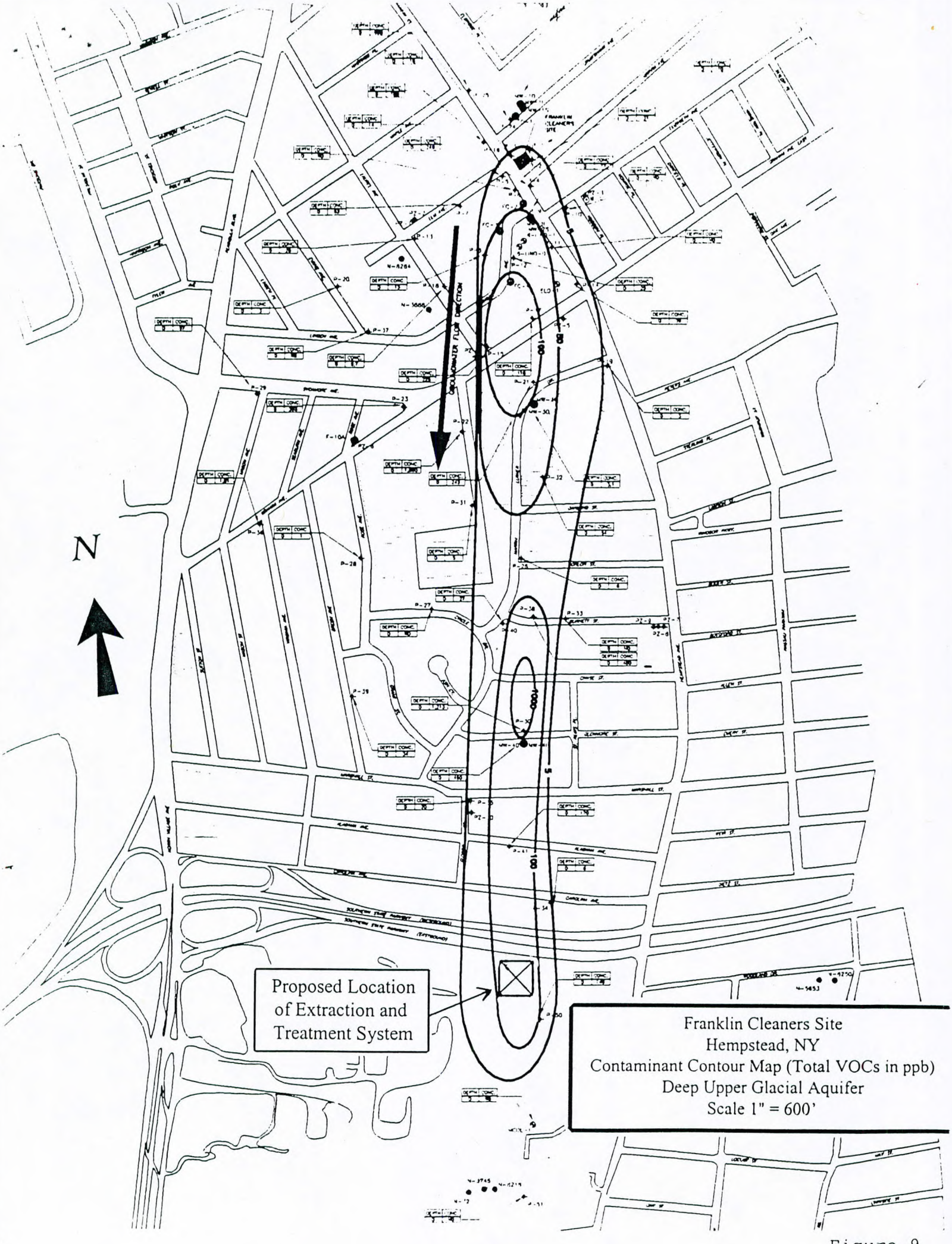
N
Proposed Location of Extraction and Treatment System
Franklin Cleaners Site
Hempstead, NY
Contaminant Contour Map (Total VOCs in ppb)
Deep Upper Glacial Aquifer
Scale 1" = 600'

Figure 9