

**FOCUSSED REMEDIAL INVESTIGATION  
WORK PLAN  
FOR  
118-130 SWALM AVENUE  
NEW CASSEL, NEW YORK**

**FOR SUBMITTAL TO**

***THE NEW YORK STATE DEPARTMENT  
OF ENVIRONMENTAL CONSERVATION***

**PREPARED BY**



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**OCTOBER, 1998**

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## SECTION 1.0 INTRODUCTION

### 1.1 Overview

This Remedial Investigation Work Plan has been prepared by Fanning, Phillips and Molnar (FP&M) for the property owned by Barouh Eaton Allen Corp. (BEAC) located at 118-130 Swalm Avenue Westbury, New York (tax map designation; Section 11, Block 164, Lots 19-29, and 58-65) (see Figure 1.1.1). The property is located within the New Cassel Industrial Area (NCIA).

The NCIA is located in the unincorporated Village of Westbury in the Town of North Hempstead, Nassau County, New York. Due to volatile organic compound (VOC) contamination of the groundwater beneath the site, the New York State Department of Environmental Conservation (NYSDEC) listed the entire NCIA on its registry of Inactive Hazardous Waste Disposal Sites (IHWDS) in 1988.

Lawler, Matusky & Skelly Engineers LLP (LMS) was contracted by NYSDEC in 1992 to conduct a site investigation of the NCIA. The objectives of the site investigation were to delineate the contaminant plumes under the NCIA, locate the source of the contaminants, and redefine the IHWDS according to identified contamination.

Initial investigations conducted in 1993 and 1994 identified several areas exhibiting significant groundwater contamination within the NCIA (LMS 1994). Potentially responsible parties for the two central section plumes and one of the western section plumes were identified; those facilities were listed as Class 2 on the registry of IHWDS. The remaining four sites within the plume regions were designated as potential registry sites requiring additional investigation.



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Engineers

FIGURE 1.1  
SITE LOCATION PLAN  
118-130 SWALM STREET  
NEW CASSEL, NEW YORK

Drawn By: L.G. Checked By: B.K. Date: 8/12/97

LMS conducted a Multisite Preliminary Site Assessment (PSA) in 1995 on the remaining four sites that required additional investigation. The objectives of the multisite PSA were to further delineate the contaminant plumes at the four sites, locate the sources of the contaminants, and assess the threat of each source to the environment. Based on the multisite PSA investigation data, five properties were recommended for inclusion on the registry of IHWDS, 15 properties were determined to be not included on the registry, and 12 properties were determined to be potential registry sites.

To resolve the status of the remaining properties that were included as potential registry sites and address data gaps for several properties in the industrial area, additional PSA investigation activities were conducted by LMS (LMS 1997). The investigation included additional file reviews, facility inspections, soil and groundwater sampling, and on-site mobile laboratory analysis. The data generated from the investigation was used to list the property at 118-130 Swalm Avenue on the NYSDEC registry of IHWDSs.

FP&M was retained by McMillan, Rather, Bennett & Rigano, P.C. to prepare this Focussed Remedial Investigation Work Plan to determine potential source areas at the site and further evaluate groundwater contamination at and in the vicinity of the site.

## **1.2 Work Plan Approach**

The objectives of this Focussed Remedial Investigation Work Plan are to further characterize the nature and extent of potential soil and groundwater contamination at the site and to obtain data necessary to evaluate remedial alternatives, if necessary, for the site. A site investigation will be conducted and will include the collection of data necessary to evaluate the distribution of contaminants in the soil and

groundwater, to identify potential contaminant sources and migration pathways, and to support a remedial alternative or Interim Remedial Measure (IRM) evaluation, if necessary.

This work plan presents FP&M's proposed technical scope of work for the Focussed Remedial Investigation. A Health and Safety Plan for the proposed investigation is also included as Appendix A.

## **SECTION 2.0 ENVIRONMENTAL SETTING**

### **2.1 Hydrogeologic Setting**

The regional geology of the New Cassel area was derived from US Geological Survey Paper #1825 entitled, "Geology and Hydrology of Northeastern Nassau County, Long Island, New York (Ibister, 1986)". In the vicinity of the site, the geology consists of a basement layer of Precambrian-age bedrock which occurs at a depth of approximately 900 feet below mean sea level (MSL).

Overlying the bedrock is a series of unconsolidated glacial deposits which consist of: the Lloyd Sand which is a stratified deposit consisting of discontinuous layers of sand, gravel, sandy clay, silt, and clay. The upper surface of the Lloyd Sand occurs at approximately 650 below MSL.

Overlying the Lloyd Sand is the Raritan Clay which consists chiefly of gray, red, white, and blue clay and silty clay and lenses of sand and gravel. The upper surface of the Raritan Clay occurs at approximately 550 below MSL. Overlying the Raritan Clay is the Magothy Formation which consists chiefly of interbedded gray and white fine sand and clayey sand and black, gray, white, and some red clay. Gravelly zones are common at the bottom of the formation but are rare in the upper part. The upper surface of the Magothy Formation is estimated to occur at 100 feet below the ground surface.

Overlying the Magothy Formation is the Upper Glacial Formation which, in the New Cassel area, is composed primarily of outwash deposits consisting of well-sorted stratified sand and gravel. The Upper Glacial deposits are the uppermost unit and are estimated to be 100 feet thick in the site vicinity.

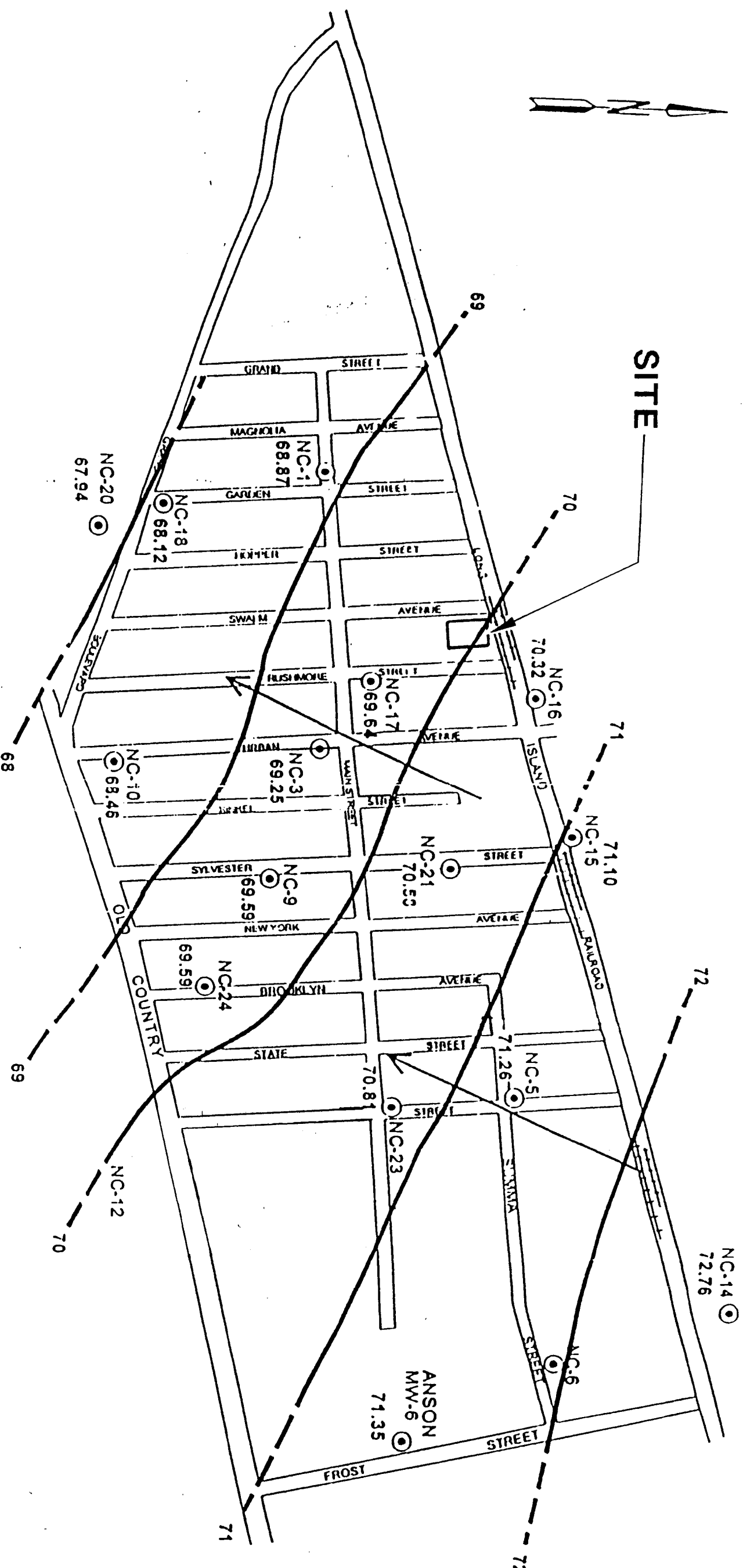
Based on the US Geological Survey Paper 82-4056 entitled, "Geology of the "20-foot" Clay and Gardiners Clay in Southern Nassau and Southwestern Suffolk Counties, Long Island, New York (Doriski and Wilde-Katz, 1982)", neither the 20-foot nor the Gardiners Clay exists under the NCIA.

The groundwater beneath the NCIA is recharged through infiltrating precipitation. The infiltrating precipitation accumulates above the bedrock and forms aquifers which correspond to the permeable geologic units. The depth to water is approximately 50 feet and the thickness of the Upper Glacial Formation is approximately 50 feet. Therefore, the Upper Glacial Aquifer may not exist in the site vicinity and the first water-bearing unit may be the Magothy Aquifer.

The site-specific groundwater flow direction across the site was ascertained from the Site Investigation Report for the New Cassel Industrial Area by LMS (February, 1995). The report showed that based on measurements from November 8 and 9, 1993, the groundwater flow direction in the vicinity of the Swalm Avenue site was generally southwest (see Figure 2.1.1). Also, based on the groundwater elevation contour map of Nassau County for 1995, obtained from the NCDH, the groundwater divide exists approximately two miles north of the site.

## **2.2 Surface Water and Drainage**

The site is located within an industrial park that has been serviced by the Nassau County Sewer System since approximately 1980. There are no wetlands, lakes, or streams in the site area.



**SOURCE:**  
NYSDEC REPORT, "NEW YORK STATE SUPERFUND CONTRACT SITE INVESTIGATION REPORT FOR NEW CASSEL INDUSTRIAL AREA SITE" (1995)

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FIGURE 2.1.1  
GROUNDWATER FLOW CONTOUR LINES  
IN VICINITY OF SITE

Drawn By: JPS    Checked By: BK    Date: 8/12/97

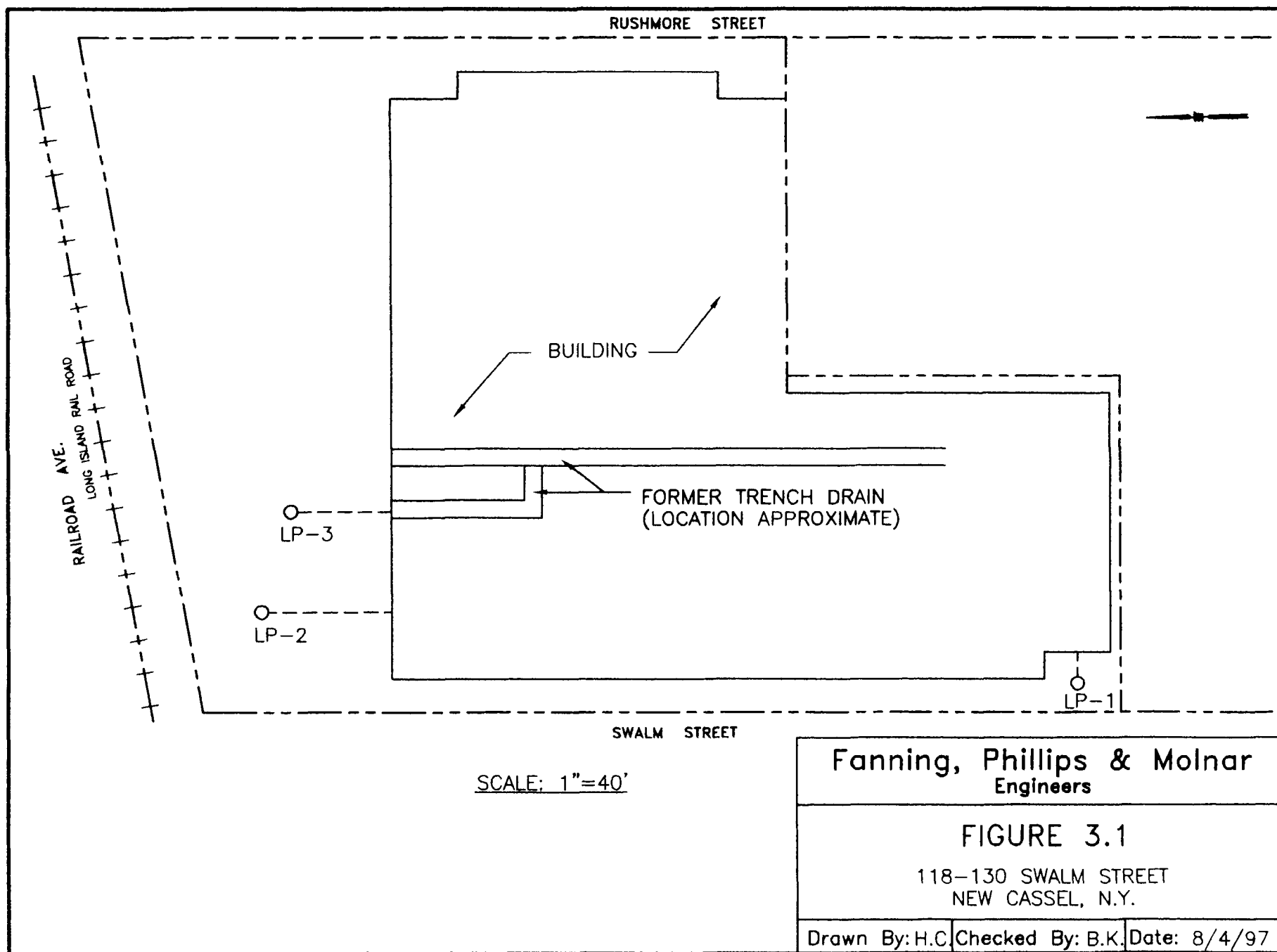
## **SECTION 3.0 SITE BACKGROUND AND SETTING**

### **3.1 Current Conditions**

The site consists of approximately 1.1 acres, and is located in an area of industrially-zoned properties. A one-story 28,000 square foot masonry and steel building occupies approximately 60 percent of the property. The area on the site north of the building consists of a former parking lot which now consists of asphalt in poor condition and exposed soil. The area contains grass and weeds throughout. A site plan is presented in Figure 3.1.

Based on a site inspection conducted by FP&M, three subsurface drainage structures have been identified at the site. One of these structures, which is located along Swalm Avenue, appears to be a former cesspool which received sanitary waste from the building. The other two structures appear to have been used by former tenants of the building as leaching pools (possibly cesspools). Evidence of a former trench drain was noted. The trench drain has been sealed with concrete to grade. The former drain led to the vicinity of the location of the two leaching structures outside of the building on the north side of the property. None of the three subsurface drainage structures appears to currently be in use and none have been abandoned by backfilling to grade. The location of these subsurface structures were identified during a site inspection by FP&M. A magnetometer was used to locate the manhole cover of one of the subsurface structures which was obscured by overlying soil and vegetation.

According to building department records, the site has been connected to the public sewer system since 1980. There are no apparent storm drainage structures located on the site.



Five 1,000-gallon USTs had been in use at the site by one of the former tenants, Varitek Machine Co., between 1983 and 1990. The USTs existed to the north of the building at the site. Materials stored in the tanks consisted of ethyl acetate, methyl ethyl ketone (two tanks), naphtha, and isopropyl alcohol. According to Nassau County Fire Marshal records, these tanks were tightness tested in 1986 and again in 1990. No records of leakage exists in the Fire Marshal's files. The tanks were abandoned in August, 1990 by filling the tanks with concrete slurry. The tanks were abandoned in accordance with Article III of the Nassau County Fire Prevention Ordinance. A 5,000-gallon UST containing petroleum fuel oil used for heating the building currently exists on the north sides of the site. NCDH files indicate that this UST passed a tightness test in 1992.

### **3.2 Current Site Operations**

The site is currently occupied by Liqui-Mark Inc., which is a manufacturer of water-based marking pens, alcohol-based marking pens, and ballpoint pens. Liqui-Mark Inc. has been operating at the site from June, 1994 to present. During an inspection by FP&M in July, 1997, there were no floor drains existing at the facility. In addition, since the site has been connected to the municipal sewer system since 1980, there is no evidence of any subsurface disposal during Liqui-Mark's tenancy of the site. However, FP&M will request that the Nassau County Department of Public Works perform a dye test to confirm this connection.

### **3.3 Site History**

According to the Town of North Hempstead Building Department records obtained by FP&M, the site is zoned Industrial-B, and was developed in 1961 with a one-story steel and masonry industrial building. The building is divided into two separate tenant spaces. A

Sanborn map dated 1968 indicated that the building contained a mechanical engraving company and a plastic extrusion company. Information supplied by the owner of the site indicated that BEAC took title of the property through Andrigal Enterprises on October 21, 1977 and, thereafter, had exclusive control and occupancy. The LMS report indicated that numerous tenants have occupied the site since that time. These include All Records Distributors from 1971 to 1974, Allomatic Industries from 1979 to 1992, Louis Jordan Labs from 1978 to 1980, Varitek Machine Co. from 1979 to 1992, and possibly Atlas Graphics in 1985. The current tenant, Liqui-Mark Corporation, has occupied the building since June, 1994. Based on the March, 1997 LMS report, the following chemicals are known to have been stored at the site:

**Louis Jordan Labs** (vitamin manufacturer)

- Vitamins
- Sugars
- Antihistamines
- Fill capsules
- Package creams

**Varitek Machine Co.** (Ink ribbon manufacturer)

- Ethyl Acetate
- Methyl Ethyl Ketone
- Naphtha
- Isopropyl Alcohol
- UCAR solution vinyl VYHHB9314
- Carbon black

**Liqui-Mark Corporation**

- Propylene Glycol Methyl Ether
- Ethylene Glycol
- Propylene Glycol
- Dipropylene Glycol
- Ethylene Glycol Phenyl Ether
- Oleic Acid
- Dimethyl Sulfoxide

Aerial photographs for the property were made available to FP&M by the Nassau County Department of Public Works. Additional photographs were obtained from Lockwood, Kessler, & Bartlett, Consulting Engineers. Photographs were viewed for the years 1950, 1957, 1962, 1966, 1969, 1972, 1978, 1984, 1988, 1992, and 1996. The use and history of the property and area immediately adjacent to the property were evaluated from aerial photographs as follows:

April, 1950

Neither the building nor Swalm Street are developed. The Long Island Rail Road track, which runs north of the property, is present. The property appears to have been used for agricultural purposes. Properties adjoining to the north, south, and west appear to have the same use. Some residences or and/or accessory buildings are located in various places on the properties. To the east of the site, an area of excavation exists in the area which is now Urban Avenue. Buildings which appear to be for industrial use are located around the excavation area.

March, 1957

Swalm Avenue is shown developed, but the site is still vacant. The area of excavation to the east is encroaching upon the eastern property boundary of the site. There is also storage noted on the southeast corner of the site. A new building is shown constructed on the property adjoining to the south. There are vehicles parked around the building, and the property is not paved. The property adjoining to the north is shown as mostly cleared land with a residence or agricultural building in its northwest corner.

March, 1962

The building is constructed on site, showing parking areas to the north and east of the building. The properties adjoining to the west, east, and south all show industrial buildings with parking areas. The property adjoining to the north is vacant of all buildings previously noted on the property and the surface of the property appears to have been worked with construction machinery.

March, 1966

Vehicles are noted around the site. There are trailers present on the north end of the site. A park is now shown on the property adjoining to the north. A small building is located on the southeast portion of the park property. Properties in the vicinity of the park all appear to be zoned residential. The properties adjoining to the east continue to show industrial buildings with parking. The property adjoining to the south had an additional building and parking area constructed since the previous photograph.

April, 1969

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph. The area adjoining the property to the east was noted as having dark, stained soil.

April, 1972

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph.

April, 1978

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph.

March, 1984

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph.

March, 1988

A structure which appears to be an air pollution reduction structure is now evident on the north end of the site. There were no other significant changes to the site or adjacent sites since the time of the previous photograph.

April, 1992

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph, with the exception of a new building on Urban Avenue.

April, 1996

There were no significant changes noted on the site or adjacent sites since the time of the previous photograph.

In summary, the aerial photographs indicate that the site was used for agricultural purposes since at least 1950, and was developed with an industrial building and associated parking areas between 1957 and 1962. There was no evidence that any dumping or outside storage areas were present at the site since 1950 based on the aerial photographs.

The adjoining properties to the west and south were also developed prior to 1962.

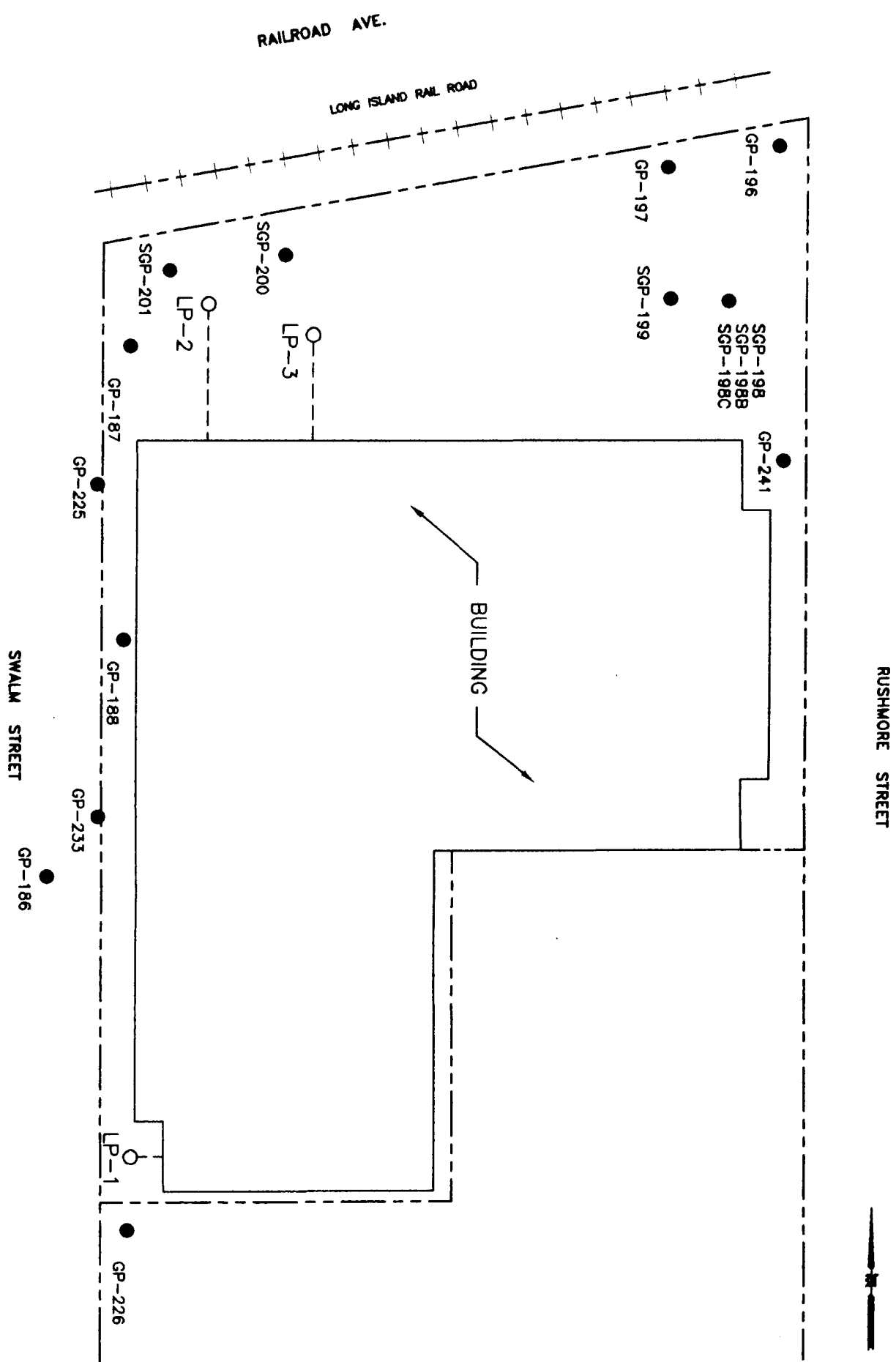
The property adjoining to the north was developed between 1962 and 1966 as a recreational park, and, to date, has remained a park.

## SECTION 4.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Information regarding the environmental history of the site was obtained from the March, 1997 LMS report entitled "Multisite PSA Task 4 Report". The report contained soil and groundwater sampling data for the 118-130 Swalm Avenue site. Based on the results of the investigation, LMS recommended that the site be placed on the registry of IHWDS as a Class 2 site.

### 4.1 Previous Soil Investigations

In October, 1995, LMS conducted a round of soil sampling at the NCIA. A total of four soil sampling points were located on the site, and the locations are shown on Figure 4.1.1. Samples were obtained from each location at varying depths and analyzed for Target Compound List VOCs. Target compounds were detected in three of the four locations sampled. The results are summarized in Table 4.1.1. In general, the concentrations of the detected compounds were found to be very low, and none of the concentrations were above NYSDEC soil cleanup objectives (SCOs) (TAGM-4046). The detected compounds were tetrachloroethene (PCE) (detected at a maximum concentration of 0.57 mg/kg which is well below the SCO of 1.4 mg/kg), methylene chloride (detected at a maximum concentration of 0.0018 mg/kg which is well below the SCO of 0.1 mg/kg and was also detected in an associated blank and, therefore, the result is questionable), trichloroethylene (TCE) (detected at one location at a concentration of 0.023 mg/kg which is well below the SCO of 0.7 mg/kg), and toluene (detected at a maximum concentration of 0.0025 mg/kg which is well below the SCO of 1.5 mg/kg).



SCALE: 1"=40'  
(SAMPLING LOCATIONS ARE APPROXIMATE)

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EXISTING SOIL AND GROUNDWATER  
SAMPLING LOCATIONS  
118-130 SWALM STREET  
NEW CASSEL, N.Y.

Drawn By: L.G. Checked By: B.K. Date: 8/4/97

**TABLE 4.1.1**  
**SUMMARY OF SOIL SAMPLING RESULTS\***  
**(SAMPLES OBTAINED OCTOBER, 1996)**

| Sample Location        | Depth Interval | Compound (mg/kg)   |        |       |         |
|------------------------|----------------|--------------------|--------|-------|---------|
|                        |                | Methylene Chloride | PCE    | TCE   | Toluene |
| SGP-198                | 10 - 11 ft.    | 0.0017             | ND     | ND    | ND      |
| SGP-198                | 18 - 19 ft.    | ND                 | 0.57   | ND    | ND      |
| SGP-200                | 1 - 2 ft.      | ND                 | 0.030  | 0.023 | 0.0011  |
| SGP-201                | 1 - 2 ft.      | ND                 | 0.0018 | ND    | 0.0025  |
| SGP-201                | 17 - 19 ft.    | 0.0018 B           | ND     | ND    | ND      |
| Soil Cleanup Objective | -              | 0.1                | 1.4    | 0.7   | 1.5     |

**Notes:**

mg/kg = milligrams per kilogram

B = Detected in associated blanks

ND = Not Detected

• = Results from Multisite PSA Task 4 Report (LMS, 1997).

MRB&R/BEAC RIWP/4411

It should be noted that an error occurred in the Multisite PSA Task 4 Report by LMS (March, 1997). On page 6-13 of the report it is stated "Target compounds were detected in three of the four [soil] samples completed. Concentrations range from ND [non-detected] in SGP-200 (11-12 ft. and 14-15 ft.) to 0.708 mg/kg PCE at SGP-198 (18-19 ft.) (Figure 6-35)." Based on FP&M's review of the report, neither the data summary tables nor Figure 6-35 of the LMS report shows that PCE was detected at 0.708 mg/kg (the highest detection of PCE in soil at the site was 0.57 mg/kg).

#### **4.2 Previous Groundwater Investigations**

A summary of groundwater sampling results for the years 1995 and 1996 are presented in Table 4.2.1 (Appendix C contains the groundwater plume maps from the 1997 LMS report). All of the groundwater samples were analyzed for VOCs. A total of ten groundwater sampling points were located at and immediately adjacent to the site. The groundwater sampling locations are presented in Figure 4.1.1. Groundwater samples were obtained at each sampling location from three different depth intervals: the water table to 65 feet, 65 feet to 85 feet, and greater than 85 feet. The results of the groundwater sampling show that PCE was detected primarily in the shallow groundwater with significant decreases in concentration with increased depth. Therefore, the contamination at the site primarily exists in the zone from the water table (50 feet below land surface) to 65 feet below land surface. The groundwater contamination primarily consists of PCE; very minor amounts of cis-1,2-dichloroethylene and trichloroethylene were also detected at the site.

The groundwater results show that PCE exists in the groundwater beneath the site at concentrations as high as 1,800 ug/l at the site. It should also be noted that both upgradient groundwater samples

**TABLE 4.2.1**  
**SUMMARY OF GROUNDWATER SAMPLING RESULTS (ug/l)**  
**1995 SAMPLES**

| Sample Location | Depth Interval        |                  |         |
|-----------------|-----------------------|------------------|---------|
|                 | Water Table to 65 ft. | 65 ft. to 85 ft. | >85 ft. |
| GP-184          | PCE 1500              | ND               | BQL     |
|                 | TCE 100               |                  |         |
| GP-186          | PCE 1800              | ND               | ND      |
| GP-187          | PCE 120               | ND               | ND      |
| GP-188          | PCE 1300              | PCE 150          | NS      |
|                 |                       | TCE 6.1          |         |

**OCTOBER, 1996 SAMPLES**

| Sample Location | Depth Interval        |                  |             |
|-----------------|-----------------------|------------------|-------------|
|                 | Water Table to 65 ft. | 65 ft. to 85 ft. | >85 ft.     |
| GP-196          | PCE 7.5               | PCE 6.0          | PCE ND      |
|                 |                       |                  | TCE 5.6     |
|                 |                       |                  | 1,2-DCE 1.2 |
| GP-197          | PCE 160               | PCE 1.3          | ND          |
| GP-225          | PC3 970               | ND               | PCE 1.3     |
| GP-226          | PCE 1600              | ND               | PCE 1.4     |
|                 |                       |                  | TCE 2.4     |
| GP-233          | PCE 1100              | PCE 5.3          | NS          |
| GP-241          | PCE 9.5               | ND               | PCE ND      |
|                 |                       |                  | TCE 5.5     |

**Notes:**

ND = Not Detected

NS = Not Sampled

ug/l = micrograms per liter

Additional VOCs detected include 1.2 ug/l cis-1,2-dichloroethylene at GP-196, >85 ft.; 2.4 ug/l trichloroethylene at GP-226, >85 ft.; and, 5.5 ug/l of trichloroethylene at GP-241, >85 ft.

obtained along the eastern side of the northern border, both showed detections of PCE (one of the upgradient samples showed a concentration of 160 ug/l). In addition, as per the Multisite PSA Task 4 Report, a well installed by the NCDH known as NC-16 and existing on the north side of the railroad tracks and north of the eastern edge of Swalm Avenue, showed PCE concentrations of 61 ug/l in a 1993 sample and 56 ug/l in a 1995 sample.

Based on the groundwater plume map shown in Figure 6.29 of the 1997 LMS report (see Appendix C), the vertical and lateral extent of groundwater contamination is fairly well defined. The only on-site area that is not well defined is the eastern edge of the plume along the southern boundary of the site. Also, the distribution of contamination apparently emanating from upgradient sources is not well defined.

#### **4.3 Additional Data Needs**

Based on a review of the previous sampling results and historical records for the site, additional data needs have been identified to fully characterize the nature and extent of contamination at the site and to evaluate potential remedial action for the site.

The following data needs are noted:

- Investigation of potential source areas of contamination in the soil at the site.
- Evaluation of potential upgradient contamination sources.
- Evaluation of the eastern extent of the groundwater plume along the southern boundary of the site.

## **SECTION 5.0 WORK PLAN RATIONALE**

### **5.1 Data Quality Objectives**

The Data Quality Objectives (DQOs) for the Remedial Investigation will be applicable to all data-gathering activities at the site. DQOs will be incorporated into sampling, analysis, and quality assurance tasks associated with the Remedial Investigation.

The primary data users for this project will be FP&M. The secondary data user will be the Data Validator. No other data users are anticipated at this time.

Data to be collected during the Remedial Investigation are intended to characterize the nature and extent of soil and groundwater contamination at the site. These data will allow for the evaluation and possible implementation of potential remedial alternatives or interim remedial measures.

For this project, it is anticipated that field screening will be performed during any soil and leaching pool sediment sampling and groundwater sampling. Field screening includes monitoring for volatile organic compounds using a Photovac MicroTIP photoionization detector (PID) or Century 128 Organic Vapor Analyzer (OVA), and visual observations of soil or groundwater characteristics. All other samples will be analyzed by a NYSDOH ELAP CLP-certified laboratory for VOCs.

The data uses will be for site characterization, possible risk assessment, evaluation of remedial alternatives or interim remedial measures, and engineering design.

### **5.2 Work Plan Approach**

The Work Plan approach is to present and evaluate previous site data, as appropriate for the respective DQOs. The existing information

will be incorporated into the tasks necessary for the completion of additional data gathering necessary to evaluate potential remedial alternatives for the site groundwater and soil. Data previously collected will be supplemented by additional sampling and analysis. Based on the findings of the investigation, remedial alternatives and IRMs may be evaluated and the most feasible alternative(s) will be identified. IRMs are intended to remediate materials which may be a source of contamination. If contamination is detected in the leaching pool sediment or other soil samples during the Remedial Investigation, an IRM work plan may be formulated and submitted to the DEC regarding the removal of sediment from the leaching pools. The IRM for the site may include the removal of contaminated leaching pool sediments and/or soils.

### **5.3 Applicable or Relevant and Appropriate Requirements**

The following applicable or relevant and appropriate requirements for the site have been preliminarily identified:

- The NYSDEC Recommended Soil Cleanup Objectives (TAGM #HWR-94-4046) will be used to compare soil and sediment samples.
- The NYSDEC Class "GA" Ambient Water Quality Standards 6 NYCRR Part 703.5 and the Division of Water Technical and Operational Guidance Series Ambient Water Quality Standards and Guidance Values will be used to compare the groundwater analytical results.

## SECTION 6.0 FIELD SAMPLING PLAN

To address the additional data needs as discussed in Section 4.2, FP&M proposes to perform the following tasks. The proposed sampling locations associated with the tasks are shown in Figure 6.1.

### 6.1 Leaching Pool Investigation

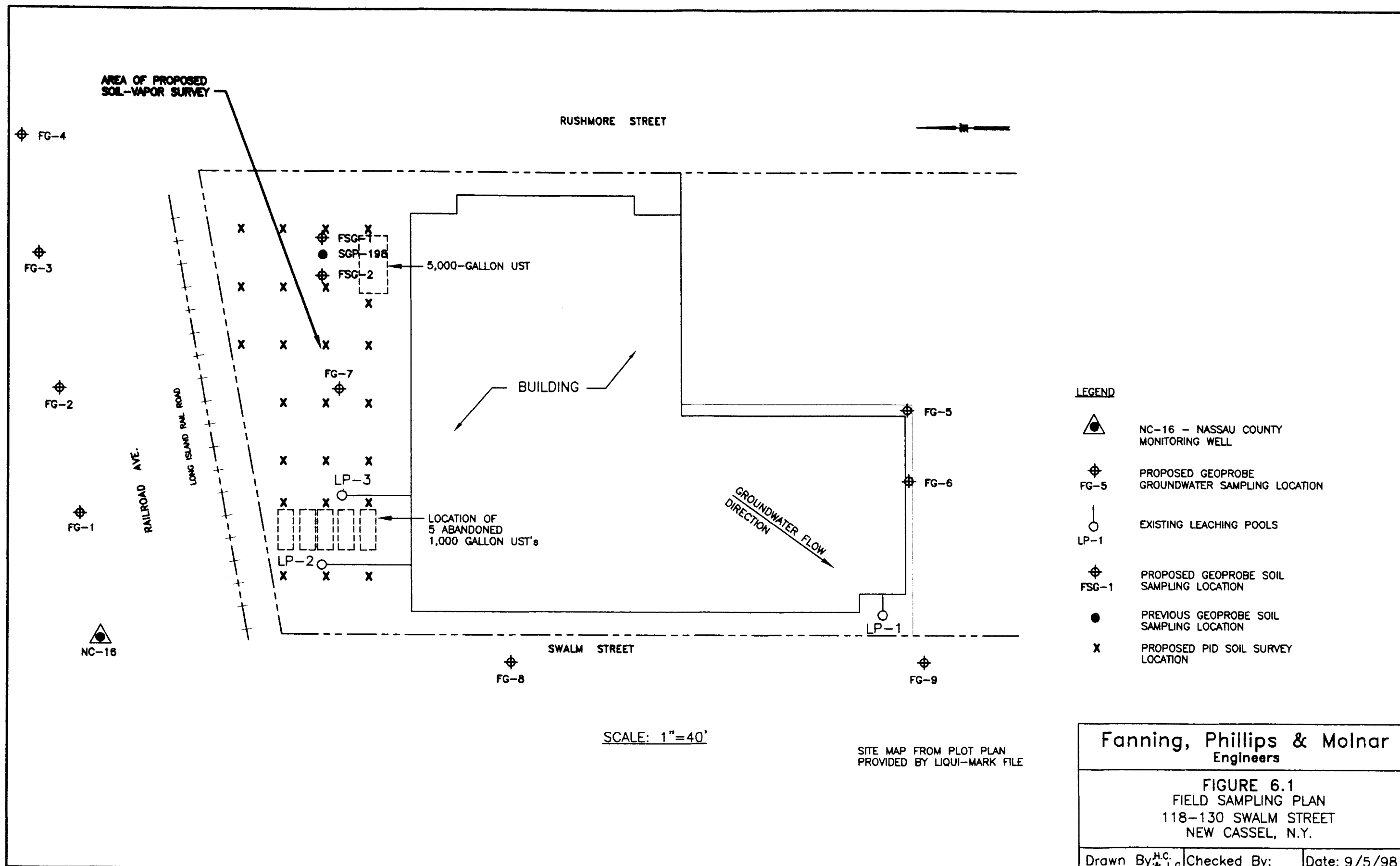
#### 6.1.1 Phase I Leaching Pool Investigation

FP&M will obtain one sample from the sediments at the base of each of the three existing leaching pools at the site. The depth to the sediment surface in each leaching pool is approximately 15 to 20 feet and the leaching pools appear to have been inactive for many years.

The samples will be obtained at a depth of approximately 1 to 2 feet below the sediment surface. The samples will be obtained with a decontaminated hand-held bucket auger with an appropriate length of extensions to permit sampling without entering the pools. The samples will be transferred to appropriate sample containers and placed in a cooler with ice for transport to the laboratory. Each leaching pool sample will be analyzed for VOCs by USEPA Method 8260 + 10 with Category B ASP deliverables.

#### 6.1.2 Phase II Leaching Pool Investigation

The leaching pool sample results from the first phase of the investigation will be submitted to NYSDEC within one week after receipt from the laboratory. Should the samples show that contamination is present in any of the pools (this determination will be made at the sole discretion of NYSDEC), FP&M will revisit the site (within one week of NYSDEC's decision) to obtain samples from the sediment surface to the water table at 10-foot intervals. Also, groundwater samples will be obtained approximately 10 feet from the edge of each of the leaching pools on the downgradient side. Based on the results of the first phase



of the investigation, NYSDEC will determine, at its sole discretion, whether the Department-approved Phase II investigation should be implemented.

## **6.2 Photoionization Detector Survey and Soil Sampling**

To determine if potential source areas are present in the soil in the lot north of the building at the site, FP&M proposes to obtain approximately 25 PID samples (approximately one sample per 600 square feet) by driving a slide hammer into the soil and creating a 30-inch deep, 0.5-inch diameter vent and measuring the emanating vapors with a PID. Based on the results of the PID survey up to 5 soil samples will be obtained at the 5 locations of highest PID readings. If no PID readings are noted, soil samples will be obtained at three locations and analyzed by a NYSDOH ELAP CLP certified laboratory for VOCs by Method 8260 + 10 . The soil samples will be obtained with a hand auger from a depth of 1 to 2 feet. In addition, at the location of the highest LMS Geoprobe soil sample result (SGP-198, 18-19 feet), FP&M proposes to perform two Geoprobe borings for the purposes of confirming the previous results and to determine the vertical distribution of PCE in the soil in that area. To achieve this, samples will be obtained at each location at depths of 18 to 20 feet, 28 to 30 feet, and 38 to 40 feet. All soil samples will be handled and analyzed as discussed in Section 6.1

## **6.3 Geoprobe Groundwater Sampling**

Nine Geoprobe groundwater samples are proposed to be obtained (as shown on Figure 6.1). Four of the locations (FG-1 through FG-4) are proposed to be located upgradient of the site and north of the railroad tracks. Their purpose is to evaluate contamination entering the site from upgradient sources. Two Geoprobe groundwater locations (FG-5 and FG-6) will be placed on the southern boundary of the site to delineate

the eastern extent of the groundwater contamination. Three Geoprobes (FG-7, FG-8, and FG-9) will be sampled at two depths.

All Geoprobe groundwater samples will be obtained from a depth of approximately 55 feet below grade (approximately 5 feet below the water table) with the exception of FG-7, FG-8, and FG-9 which will be sampled at depths of 55 and 100 feet below grade on the top of the Magothy Aquifer. Dedicated polyethylene tubing will be used to collect the groundwater samples. The sample bottles will be filled to zero head space and the samples will be handled in the manner described in Section 6.1.

#### **6.4 Quality Assurance Project Plan**

##### **6.4.1 Sampling Equipment Decontamination Procedures**

All non-disposable downhole equipment (i.e., augers, hand augers) used during the drilling and sampling will be decontaminated prior to use at each location to prevent cross contamination. For groundwater sampling, dedicated, disposable bailers will be used. All non-disposable equipment will be steam cleaned or decontaminated. The decontamination procedures are as follows:

1. Equipment will be scrubbed in a bath of potable water and low-phosphate detergent;
2. Potable water rinse;
3. Rinse with ten percent nitric acid (one percent for carbon steel) if metals are to be analyzed;
4. Potable water rinse;
5. A pesticide-grade methanol rinse followed by a pesticide-grade hexane rinse;
6. Deionized water rinse;
7. Air dry.

#### 6.4.2 Chain-of-Custody Procedures

For each day of sampling, a chain-of-custody sheet will be completed and submitted to the laboratory (a copy of the chain-of-custody will be retained by FP&M). The chain-of-custody sheet will include the project name, the sampler's signature, the sampling locations, intervals, and analysis parameters requested.

#### 6.4.3 QA/QC Samples

QA/QC samples will be obtained during the soil/sediment and groundwater sampling.

During soil/sediment and groundwater sampling, one equipment blank per day per matrix sampled will be prepared by pouring laboratory-supplied, deionized water through either the sampling bailer or the hand auger and into a set of sample containers. The equipment blank will be tested for the same analytes as the matrices to be sampled that day. If more than one decontamination event occurs in one day, the same person will perform the decontamination to maintain uniformity in the procedure. The equipment blank results will be reviewed to evaluate the potential for field or laboratory contamination and will attest to the quality of the decontamination procedures.

During groundwater or soil sampling, one trip blank will be provided by the laboratory for each set of samples to be submitted to the laboratory for VOC analysis. The trip blanks will be prepared from analyte-free, deionized water by the laboratory and will remain in the coolers in which the samples are stored. Trip blanks will be analyzed for VOCs only. The purposes of trip blanks are to ensure that no cross-contamination of VOCs occurs in the sample cooler and to attest to laboratory water quality.

A matrix spike and matrix spike duplicate for groundwater and soil samples will be submitted to the laboratory by obtaining an extra volume

of selected groundwater samples which are to be analyzed for VOCs. The frequency of matrix spike and matrix spike duplicates will be one per 20 samples for each matrix. The purpose of the matrix spike and matrix spike duplicates are to confirm the accuracy and precision of the laboratory.

In addition, blind duplicate samples for each matrix will be obtained at a frequency of at least five percent of the total number of samples obtained to attest to the precision of the laboratory.

#### **6.5 Sample Analysis**

All samples will be submitted to a NYSDOH ELAP CLP-certified laboratory. Laboratory testing and data reporting will be performed by a subcontracted laboratory. The proposed subcontractor laboratory is Severn Trent Laboratory, Monroe, Connecticut.

All samples will be analyzed for VOCs using EPA Method 8260 + 10, with NYSDEC ASP Category B deliverables.

#### **6.6 Data Validation**

All samples obtained and analyzed will be subjected to data validation by an independent contractor using NYSDEC ASP "95 Rev." and EPA Region II Functional Guidelines. The proposed data validation subcontractor is Data Validation Services of North Creek, New York. The data validation will verify that the analytical results are of sufficient quality to be relied upon to assess the potential contamination in the soils and groundwater in the vicinity of the former subsurface leaching pools. The results of the data validation will be presented as an appendix to the report.

Samples will be tracked through the field collection, laboratory analysis, and laboratory report preparation processes. FP&M will

perform the sample tracking and assemble the analytical results as they are received.

#### **6.7 Data Evaluation**

Data collected during the Remedial Investigation will be assembled, reviewed, and evaluated to assure satisfaction of the Remedial Investigation objectives.

The data collected will be organized and analyzed to identify the nature and extent of contamination in the site soil/sediment and groundwater, and to further identify potential on-site sources of contaminants.

The soil and water quality data will be evaluated and mapped to illustrate the areal and vertical extent of the contaminants detected. The distribution of soil and groundwater contaminants detected will be considered to evaluate potential sources of contaminants.

Maps and tables of the data from the previous sampling programs and from the Remedial Investigation will be used to assist in the analysis. The results of the data evaluation will be discussed in the Focussed Remedial Investigation Report.

#### **6.8 Assessment of Potential Remedial Alternatives**

After existing and newly-acquired data are evaluated, the potential remedial objectives and alternatives will be developed, if appropriate. On-site soil and groundwater contamination and potential migration pathways will be identified.

#### **6.9 Remedial Investigation Report Outline**

After completion of the field investigation, sample analysis, data evaluation, and assessment of potential remedial alternatives, FP&M will prepare a Focussed Remedial Investigation Report. The report will

contain a summary of results from previous sampling events as well as the data and analyses performed as part of this investigation.

A Focussed Remedial Investigation Report format is presented in Table 6.9.1.

#### **6.10 Estimated Schedule of the Remedial Investigation Activities**

Table 6.10.1 presents the estimated schedule for the execution of the Remedial Investigation Activities.

#### **6.11 Miscellaneous**

The project manager for this project will be Peter Dermody, Senior Hydrogeologist, Department Manager. The FP&M field supervisor will be William Keenan. The drilling firm will be Land, Air and Water, Inc. The Quality Assurance Officer (QAO) will be Stephanie Davis, Senior Hydrogeologist. Ms. Davis' resume is included in Appendix D.

The laboratory results and method detection limits for each analyte in each matrix will be as per NYSDEC ASP 95 Revision Category B requirements. Table 6.11.1 shows the number of samples to be collected, matrices, holding time, analytical protocols, and estimated number of QA/QC samples.

The QAO will develop a Data Usability Report which will be included in the Focussed Remedial Investigation Report.

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**TABLE 6.10.1**  
**ESTIMATED TIME SCHEDULE FOR THE REMEDIAL INVESTIGATION/IRM**  
**118-130 SWALM AVENUE, NEW CASSEL NEW YORK**

| TASK | DESCRIPTION                                                            | TIME IN WEEKS |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|------|------------------------------------------------------------------------|---------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|      |                                                                        | 1             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1    | Conduct Field Investigation: soil, sediment, and groundwater sampling. | ■             | ■ |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
| 2    | Laboratory Analysis                                                    |               |   | ■ | ■ | ■ | ■ |   |   |   |    |    |    |    |    |    |    |
| 3    | Conduct Additional Sampling (if necessary)                             |               |   |   |   |   |   | ■ | ■ |   |    |    |    |    |    |    |    |
| 4    | Data Evaluation                                                        |               |   |   |   |   |   |   |   | ■ | ■  | ■  |    |    |    |    |    |
| 5    | Laboratory Analysis                                                    |               |   |   |   |   |   |   |   | ■ | ■  | ■  | ■  |    |    |    |    |
| 6    | Data Evaluation                                                        |               |   |   |   |   |   |   |   |   |    |    |    | ■  | ■  | ■  |    |
| 7    | Report Submission                                                      |               |   |   |   |   |   |   |   |   |    |    |    |    |    | ■  | ■  |

**TABLE 6.11.1**  
**SAMPLE CONTAINERS, PRESERVATION, HOLDING TIMES,**  
**AND ANALYSIS METHODS**

| <b>Sample Matrix</b> | <b>Number of Samples</b> | <b>Parameters</b> | <b>Containerization Type</b> | <b>Preservation</b>  | <b>Holding Time</b> | <b>NYSDEC Analysis Method</b> |
|----------------------|--------------------------|-------------------|------------------------------|----------------------|---------------------|-------------------------------|
| Soil/Sediment        | 14                       | VOCs              | Glass Jar with Teflon Liner  | 4°C                  | 7 days              | EPA Method 8260 + 10          |
| Groundwater          | 6                        | VOCs              | Glass Jar with Teflon Liner  | 4°C (Zero Headspace) | 7 days              | EPA Method 8260 + 10          |
| QA/QC                | 8                        | VOCs              | Glass Jar with Teflon Liner  | 4°C (Zero Headspace) | 7 days              | EPA Method 8260 + 10          |

**Notes:**

- Field blanks and trip blanks will be obtained at a rate of one per day or one per 20 samples obtained.
- The laboratory will report the data in a NYSDEC ASP Category B deliverables package.
- Holding times begin on the date the sample received by the laboratory. Samples must be received by the laboratory within 48 hours of sampling.

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**APPENDIX A**  
**HEALTH AND SAFETY PLAN**

**HEALTH AND SAFETY PLAN**  
**FOR**  
**REMEDIAL INVESTIGATION ACTIVITIES**  
**AT THE SWALM AVENUE SITE NO. 130043**  
**118-130 SWALM AVENUE**  
**NEW CASSEL, NEW YORK**

**PREPARED FOR**  
**McMILLAN, RATHER, BENNET & RIGANO, P.C.**

**PREPARED BY**  
**FP&M**  
***FANNING, PHILLIPS & MOLNAR***  
***909 MARCONI AVENUE***  
***RONKONKOMA, NEW YORK 11779***

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**SITE WORKER  
HEALTH AND SAFETY STATEMENT**

I have read the Health and Safety Plan (HASP) for the Remedial Investigation at the Swalm Avenue site at 118-130 Swalm Avenue in New Cassel, New York and I have reviewed and understand the potential hazards and the precautions/contingencies of each potential hazard.

I agree to abide by the stipulations of this HASP and further agree to hold Fanning, Phillips and Molnar harmless from, and indemnify against, any accidents which may occur as a result of activities at the site regardless of whether or not they were covered in the HASP.

|                              |                                    |
|------------------------------|------------------------------------|
| Name: _____<br>_____<br>Sign | Representing: _____<br>Date: _____ |
|------------------------------|------------------------------------|

|                              |                                    |
|------------------------------|------------------------------------|
| Name: _____<br>_____<br>Sign | Representing: _____<br>Date: _____ |
|------------------------------|------------------------------------|

|                              |                                    |
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| Name: _____<br>_____<br>Sign | Representing: _____<br>Date: _____ |
|------------------------------|------------------------------------|

|                              |                                    |
|------------------------------|------------------------------------|
| Name: _____<br>_____<br>Sign | Representing: _____<br>Date: _____ |
|------------------------------|------------------------------------|

## SECTION 1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1988)" and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities" (U.S. Department of Health and Human Services, 1985).

### 1.1 Scope and Applicability of the HASP

This HASP is designed to be applicable to locations where soil and groundwater sampling are performed at the Swalm Avenue site (the "site") in New Cassel, New York by all parties that either perform or witness the activities on site. This HASP may also be modified or amended to meet specific needs of the work proposed. This HASP will detail the site safety procedures, site background, and safety monitoring. Contractors will be required to adopt this HASP in full.

The Health and Safety Officer (HSO) will be present at the site to inspect the implementation of the HASP, however, it is the sole responsibility of the contractor(s) to comply with the HASP.

The HASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen site conditions which may arise.

### 1.2 Site Work Zone and Visitors

The site work zone (a.k.a. exclusion zone) during the soil or groundwater sampling will be a 30-foot radius about the work location.

This work zone may be extended if, in the judgment of the health and safety officer (HSO), site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with, the HASP. The HSO will deny access to those whose presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the HASP.

All site workers including the contractors will be required to have 40-hour hazardous material training (eight-hour refresher courses annually), respirator fit test certification, and medical surveillance as stated in 29 CFR 1910.120.

Copies of documentation certifying the above-listed requirements will be kept at the site in the possession of the HSO.

The HSO will also give an on-site health and safety discussion to all site personnel, including the contractors prior to initiating the site work. Workers not in attendance during the health and safety talk will be required to have the discussion with the HSO prior to entering the work zone.

Emergency telephone numbers and directions to the nearest hospital will be kept at the site in the possession of the HSO and will be available to all site workers and visitors.

**SECTION 2.0**  
**KEY PERSONNEL/ALTERNATES**

The key personnel/alternates and their responsibilities are given in Figure 2.1. The project manager for this project is Peter Dermody. The project hydrogeologist will be William P. Keenan. Mr. Keenan will also act as HSO.

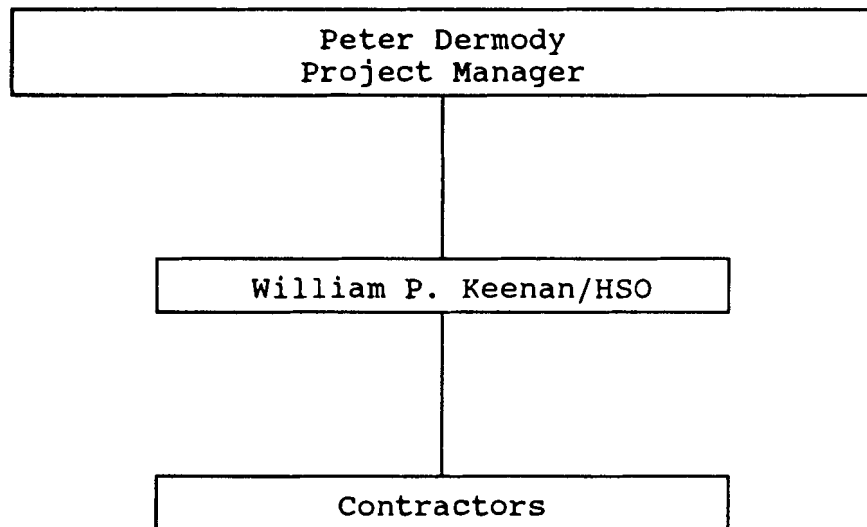


Figure 2.1 - Personnel Organizational Responsibility Chart for Health and Safety

## SECTION 3.0 SITE BACKGROUND

### 3.1 Site History and Known Chemical Constituents at the Site

The site is located within the New Cassel Industrial Area at 118-130 Swalm Avenue. The site is approximately 1.1 acres in size and occupied by a 28,825-square-foot building. Topography at the site is essentially flat. The chemicals known to be present at the site are presented in Table 3.1.1 and 3.1.2.

TABLE 3.1.1  
COMPOUNDS DETECTED IN SOIL SAMPLES  
WITH THRESHOLD LIMIT VALUES  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

| CONTAMINANT                | SHORT TERM EXPOSURE<br>LIMIT (STEL)<br>15 MINUTES | TIME WEIGHTED AVERAGE<br>8 HOUR<br>EXPOSURE LIMIT |
|----------------------------|---------------------------------------------------|---------------------------------------------------|
| Perchloroethylene<br>(PCE) | 200 ppm<br>1357 mg/m <sup>3</sup>                 | 50 ppm<br>339 mg/m <sup>3</sup>                   |
| Trichloroethylene<br>(TCE) | 200 ppm<br>1070 mg/m <sup>3</sup>                 | 50 ppm<br>269 mg/m <sup>3</sup>                   |
| Trichloroethane<br>(TCA)   | 450 ppm<br>2460 mg/m <sup>3</sup>                 | 350 ppm<br>1910 mg/m <sup>3</sup>                 |
| Toluene                    | 100 ppm<br>377 mg/m <sup>3</sup>                  | 150 ppm<br>565 mg/m <sup>3</sup>                  |
| Methylene Chloride         | -                                                 | 50 ppm<br>174 mg/m <sup>3</sup>                   |

TABLE 3.1.2  
COMPOUNDS DETECTED IN WATER SAMPLES  
WITH THRESHOLD LIMIT VALUES  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

| CONTAMINANT                | SHORT TERM EXPOSURE<br>LIMIT (STEL)<br>15 MINUTES | TIME WEIGHTED AVERAGE<br>8 HOUR<br>EXPOSURE LIMIT |
|----------------------------|---------------------------------------------------|---------------------------------------------------|
| Perchloroethylene<br>(PCE) | 200 ppm<br>1357 mg/m <sup>3</sup>                 | 50 ppm<br>339 mg/m <sup>3</sup>                   |
| Trichloroethylene<br>(TCE) | 200 ppm<br>1070 mg/m <sup>3</sup>                 | 50 ppm<br>269 mg/m <sup>3</sup>                   |
| cis-1,2-dichloroethene     | -                                                 | 200 ppm<br>793 mg/m <sup>3</sup>                  |

**SECTION 4.0**  
**TASK/OPERATION HEALTH AND SAFETY ANALYSIS**

This section will present health and safety analyses for the soil sampling and groundwater sampling tasks.

**4.1 Soil Sampling Safety Analysis**

Sampling of soil will be performed by FP&M personnel using a hand auger. During leaching pool sampling, no person will enter the leaching pools or place their head below the level of the manholes. The depth to groundwater is estimated to 50 feet below grade at the site. FP&M personnel will be present to observe the drilling and the health and safety operations. In general, FP&M will employ one to two persons at the site. No drilling or other site operations will be conducted by contractors without the presence of an FP&M representative on site. In the event that the HSO is not present on the site, the Assistant HSO will implement the HASP.

Based on the site history and analysis of MSDS sheets pertaining to current operations at the site, it has been determined that known potential chemical concerns consist of volatile organic compounds in the soil and groundwater at site.

Organic vapor concentrations will be monitored in the work zone by utilizing a Photovac MicroTIP Photoionization Detector (PID). The PID will be "zeroed" by exposing the PID to a canister of hydrocarbon-free air (<0.1 parts per million (ppm) hydrocarbons). Background organic vapor concentrations will then be established in the work zone prior to drilling and recorded in the HSO field book.

Upon commencement of drilling, PID readings will be obtained in the workers' breathing zone. A PID reading will also be taken at the

borehole approximately every 10 minutes thereafter. At the discretion of the HSO, PID readings may be obtained more frequently. All readings and observations will be recorded in the HSO field book. PID air monitoring will be conducted by FP&M personnel.

Steady-state PID readings greater than five ppm in the worker's breathing zone will require upgrading to Level C personal protective equipment. Steady-state readings, for this purpose, will be defined as readings exceeding five ppm above background for a minimum of ten seconds. Readings will be obtained at points approximately one foot above and then around the borehole. These points will define the worker's breathing zone.

Upon encountering PID levels greater than five ppm above background in the worker's breathing zone, all personnel will be evacuated from the work zone in the upwind direction (if applicable). Specific evacuation routes will be discussed prior to commencement of work at each location based on work location and wind direction. In addition, an evacuation meeting place will be determined. Level C personal protection will be implemented including full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section 7.0). All FP&M personnel and contractors must be properly trained and fit tested prior to donning respirators. If, at any time, PID readings exceed steady-state levels greater than 50 ppm above background, or any conditions exist which the HSO determines will require Level B personal protective equipment, all work at the site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernable. Level B conditions are not anticipated to be encountered;

however, if level B conditions arise, no site work will be performed by FP&M or contractors and a complete evaluation of the operation will be performed and this HASP will be modified.

All drilling personnel will be required to wear chemical-resistant gloves (such as butyl or nitrile) when the potential for dermal contact with the soil samples is possible. Dermal contact with soils removed from the ground by the Geoprobe operations will be avoided.

#### 4.2 Other Safety Considerations

##### 4.2.1 Noise

During Geoprobe operations, operation of generators, or any other operation which may generate potentially harmful levels of noise, the HSO will monitor noise levels with a Realistic<sup>™</sup> hand-held sound level meter. Noise levels will be monitored in decibels (dBs) in the A-weighted, slow-response mode. Noise level readings which exceed the 29 CFR 1910.95 permissible noise exposure limits will require hearing protection (see Table 4.2.1.1 for permissible noise exposures).

Hearing protection will be available to all site workers and will be required for exceedance of noise exposure limits. The hearing protection will consist of foam, expansion-fit earplugs (or other approvable hearing protection) with an Environmental Protection Agency noise reduction rating of at least 29 dB. Hearing protection must alleviate worker exposure to noise to an eight-hour time-weighted average of 85 dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

TABLE 4.2.1.1  
PERMISSIBLE NOISE EXPOSURES\*  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

| <u>Duration Per Day</u><br><u>Hours</u> | <u>Sound Level dBA</u><br><u>Slow Response</u> |
|-----------------------------------------|------------------------------------------------|
| 8                                       | 90                                             |
| 6                                       | 92                                             |
| 4                                       | 95                                             |
| 3                                       | 97                                             |
| 2                                       | 100                                            |
| 1½                                      | 102                                            |
| 1                                       | 105                                            |
| ½                                       | 110                                            |
| ¼ or less                               | 115                                            |

NOTES: When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:  $C_1/T_1 + C_2/T_2$  C./T. exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

\* Standards derived from 29 CFR 1910.95

#### 4.2.2 Slip/Trip/Fall Preventative Measures

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. All site workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

#### 4.2.3 Insects and Ticks

Insect and tick problems are expected to be minimal. Potential insect problems include, but are not limited to, bees, wasps, and hornets. Prior to commencement of work, each work area will be surveyed for nests and hives to reduce the possibility of disturbing these insects. In addition, each site worker will be asked to disclose any allergies related to insect stings or bites. The worker will be requested to keep his or her anti-allergy medicine on site.

Tick species native to Long Island consist of the pinhead-sized deer tick and the much-larger dog tick. All site workers will be advised to avoid walking through tall grassy areas where possible and will be advised to check for ticks on clothing periodically.

#### 4.2.4 Heat/Cold Stress

Heat stress may become a concern especially if protective clothing is donned which will decrease natural ventilation. To assist in reducing heat stress the following measures will be taken:

- o An adequate supply of water or other liquids will be brought on site. To prevent dehydration, personnel will be encouraged to drink generous amounts of water even if not thirsty.

- o A shady rest area will be designated (such as beneath the trees in the northeast corner of the property) to provide shelter during sunny days.
- o In hot weather, workers wearing protective clothing may be rotated. When the temperature is over 70 degrees Fahrenheit and personnel are wearing protective clothing, heat stress monitoring may be implemented as follows:
  - o Heart rate may be measured by counting the radial pulse for 30 seconds at the beginning of the rest period. The heart rate should not exceed 110 beats per minute. If the rate is higher, the next work period will be shortened by ten minutes (or 33%). If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle will be shortened by 33%. The HSO will decide on the length of work periods and rest periods based on site conditions.
  - o Body temperature may be measured, if deemed necessary, at the beginning of the rest period. Oral temperature should not exceed 99 degrees Fahrenheit. If it does, the next work period will be shortened by ten minutes (or 33%). However, if the oral temperature exceeds 99.7 degrees Fahrenheit at the beginning of the next period, the following work cycle will be further shortened by 33%. Work will not re-commence until by temperature has dropped below 99 degrees Fahrenheit.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions.

Heat-related problems are:

- o Heat rash: caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.
- o Heat cramps: caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.
- o Heat exhaustion: caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.
- o Heat stroke: the most severe form of heat stress. Can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold exposure is a concern if work is conducted during cold weather or marginally cold weather during precipitation periods or moderate to high wind velocity periods. To assist in reducing cold exposure the following measures will be taken:

- o All personnel will be required to wear adequate and appropriate clothing. This will include head gear to prevent the high percentage loss of heat that occurs in this area (thermal liners for hard hats if hard hats are required).
- o Provide a readily available warm shelter near each work zone.
- o Carefully schedule work and rest periods to account for the current temperature and wind velocity conditions.
- o Monitor work patterns and physical condition of workers and rotate personnel, as necessary.

Indications of cold exposure range from shivering, dizziness, numbness, confusion, weakness, impaired judgement, impaired vision to drowsiness. Medical help will be obtained for serious conditions if they occur.

Cold exposure related problems are:

- o Frost bite: Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.
- o Hypothermia: Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat. The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse rate and breathing rate and death.

#### 4.2.5 Potential Electrical Hazards

Potential electric hazards consist mainly underground power lines. Underground potential electrical hazards will be minimized by having a utility markout performed for the site. In addition, available as-built site blueprints will be used to avoid contact with subsurface utility lines or structures. As a final precaution, prior to drilling at any location, post-hole digging or hand augering will be performed by the drillers to a depth of three to four feet to check for the existence of subsurface utility lines or structures.

#### 4.2.6 The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the site workers in groups of two (or three if necessary). Each person (buddy) will be able to:

- o Provide his or her partner with assistance.
- o Observe his or her partner for signs of chemical or heat exposure.

- o Periodically check the integrity of his or her partner's protective clothing.
- o Notify the HSO or others if emergency help is needed.

The buddy system will be instituted at the beginning of each work day. If new workers arrive on site, a buddy will be chosen prior to the new worker entering the work zone.

#### 4.2.7 Site Communications

Two sets of communication systems will be established at the site: internal communication among personnel on-site, and external communication between on-site and off-site personnel.

Internal communication will be used to:

- o Alert team members to emergencies.
- o Pass along safety information such as heat stress check, protective clothing check, etc.
- o Communicate changes in the work to be accomplished.
- o Maintain site control.

Due to ambient noise, verbal communications may be difficult at times. The HSO will carry a whistle (and compressed air horn if respirators are donned) to signal site workers. A single whistle blast will be the signal to immediately evacuate the work zone through the access control point. This signal will be discussed with all site workers prior to commencement of work.

An external communication system between on-site and off-site personnel will be established to:

- o Coordinate emergency response
- o Report to the Project Manager
- o Maintain contact with essential off-site personnel

A field telephone will be available at all times in the HSO's vehicle. In addition, the nearest stationary phone will be identified prior to the commencement of site operations and this location will be relayed to all site workers.

#### 4.2.8 General Safe Work Practices

Standing orders which will be applicable during site operations are as follows:

- o No smoking, eating, drinking, or application of cosmetics in the work zone.
- o No matches or lighters in the work zone.
- o All site workers will enter/exit work zone through the site access point.
- o Any signs of contamination, radioactivity, explosivity, or unusual condition such as dead animals will require evacuating the site immediately and reporting the information to the HSO.
- o Loose fitting clothing or loose long hair will be prohibited in the work zone during drilling operations.
- o A signal person will direct the backing of work vehicles.
- o Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

**SECTION 5.0**  
**PERSONNEL TRAINING REQUIREMENTS**

All FP&M personnel and contractor personnel will receive adequate training prior to entering the site. FP&M and contractor's personnel will, at a minimum, have completed OSHA-approved, 40-hour hazardous materials site safety training and OSHA-approved, eight-hour safety refresher course within one year prior to commencing field work. The HSO will have received the OSHA-approved, eight-hour course on managing hazardous waste operations. In addition, each worker must have a minimum of three days field experience under the direct supervision of a trained, experienced supervisor.

Prior to site field work, the HSO will conduct an in-house review of the project with respect to health and safety with all FP&M personnel who will be involved with field work at the site. The review will include discussions of signs and symptoms of chemical exposure and heat stress that indicate potential medical emergencies presented in Table 5.1. In addition, review of personal protective equipment will be conducted to include the proper use of air-purifying respirators.

**TABLE 5.1**  
**SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS**  
**DETECTED AT THE SWALM AVENUE SITE,**  
**NEW CASSEL, NEW YORK**

| Type of Hazard  | Signs and Symptoms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chemical Hazard | Behavioral changes<br>Breathing difficulties<br>Changes in complexion of skin color<br>Confusion<br>Coordination difficulties<br>Coughing<br>Depression<br>Dermatitis<br>Dilated Pupils<br>Dizziness<br>Euphoria<br>Fatigue and/or weakness<br>Flushed face and/or neck<br>Insomnia<br>Irregular heartbeat<br>Irritability<br>Irritation of eyes, nose, respiratory tract,<br>skin or throat<br>Headache<br>Lacrimation<br>Light-Headedness<br>Muscle Fatigue<br>Nausea<br>Nervousness<br>Numbness in limbs<br>Paresthesia<br>Sleepiness<br>Tingling<br>Tremors<br>Vertigo<br>Visual disturbance<br>Vomiting |
| Heat Exhaustion | Clammy skin<br>Confusion<br>Dizziness<br>Fainting<br>Fatigue<br>Heat rash<br>Light-headedness<br>Nausea<br>Profuse sweating<br>Slurred speech<br>Weak pulse                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**TABLE 5.1 - CONTINUED**  
**SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS**  
**DETECTED AT THE SWALM AVENUE SITE,**  
**NEW CASSEL, NEW YORK**

| Type of Hazard                | Signs and Symptoms                                                                                                                                                                             |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Heat Stroke<br>(may be fatal) | Confusion<br>Convulsions<br>Hot skin, high temperature (yet may feel chilled)<br>Incoherent speech<br>Staggering gait<br>Sweating stops (yet residual sweat may be present)<br>Unconsciousness |

**SECTION 6.0**  
**MEDICAL SURVEILLANCE PROGRAM**

All workers at the site must participate in a medical surveillance program in accordance with 29 CFR 1910.120. A medical examination and consultation must have been performed within the last twelve months to be eligible for field work.

The content of the examination and consultation will include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances, health hazards, and fitness for duty including the ability to wear required personal protective equipment under conditions (i.e., temperature extremes) that may be expected at the work site.

All medical examinations and procedures shall be performed by, or under the supervision of, a licensed physician.

The Physician shall furnish a written opinion containing:

- o The results of the medical examination and tests.
- o The physician opinion as to whether the employee has any detected medical conditions which would place the worker at increased risk of material impairment of the employee's health from work in hazardous waste operations.
- o The physician's recommended limitations upon the worker assigned to the work.
- o A statement that the worker has been informed by the physician of the results of the medical examination and any further examination or treatment.

An accurate record of the medical surveillance will be retained. The record will consist of at least the following information:

- o The name and social security number of the employee.
- o Physicians written opinions, recommended limitations, and results of examinations and tests.
- o Any worker medical complaints related to exposure to hazardous substances.

These medical records will be kept on file for a duration of 30 years after the project is completed. EPA will be given 90 days notification prior to destroying the records.

## SECTION 7.0 PERSONAL PROTECTIVE EQUIPMENT

### 7.1 General Considerations

The two basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

Potential site hazards have been discussed previously in Section 4.0. The duration of site activities is estimated to be three to five days. All work is expected to be performed during daylight hours and workdays, in general, are expected to be eight to ten hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the site activities, based on past investigations, are anticipated to be Level D with the possibility of upgrading to Level C. The equipment included for each level of protection is provided as follows:

#### Level C Protection

Personnel protective equipment:

- Air-purifying respirator, full-face
- Chemical-resistant clothing includes: Tyvek™ (spunbonded olefin fibers) for particulate and limited splash protection or Saranex™ (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls\*, or
- Long cotton underwear\*
- Gloves (outer), chemical-resistant
- Gloves (inner), chemical-resistant

- Boots (outer), leather or chemical-resistant, steel toe and shank.
  - Boot covers (outer), chemical-resistant (disposable)\*
  - Hard hat (face shield)\*
  - Escape mask\*
  - 2-way radio communications (inherently safe)\*
- (\*) optional

#### Criteria for Selection of Level C Protection

Meeting all of these criteria permits use of Level C Protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below 50 ppm on the OVA.

#### Level D Protection

Personnel protective equipment:

- Coveralls
  - Gloves\*
  - Boots/shoes, leather or chemical-resistant, steel toe and shank.
  - Safety glasses or chemical splash goggles\*
  - Hard hat (face shield\*)
  - Escape mask\*
- (\*) optional

### Criteria for Selection of Level D Protection

Meeting any of these criteria allows use of Level D Protection:

- No contaminant levels above 5 ppm organic vapors or dusty conditions are present.
- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

### Additional Considerations for Selecting Levels of Protection

Another factor which will be considered in selecting the appropriate level of protection is heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator face piece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of

selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

## 7.2 Donning and Doffing Ensembles

### Donning an Ensemble

A routine will be established and practiced periodically for donning a Level C ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone.

Table 7.2.1 lists sample procedures for donning a Level C ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

### Doffing an Ensemble

Exact procedures for removing Level C ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others.

Doffing procedures are provided in Table 7.2.2. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

## 7.3 Respirator Fit Testing

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with

TABLE 7.2.1  
SAMPLE DONNING PROCEDURES  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection 7.4).
2. Adjust hard hat or headpiece if worn, to fit user's head.
3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.
4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.
5. Don the respirator and adjust it to be secure, but comfortable.
6. Perform negative and positive respirator facepiece seal test procedures.
  - To conduct a negative-pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.
  - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.
7. Depending on type of suit:
  - Put on inner gloves (surgical gloves).
  - Additional overgloves, worn over attached suit gloves, may be donned later.
8. Put on hard hat
9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.

**TABLE 7.2.2**  
**DOFFING PROCEDURES**  
**SWALM AVENUE SITE**  
**NEW CASSEL, NEW YORK**

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.
2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.
3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.
4. Sitting, if possible, remove both legs from the suit.
5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

#### 7.4 Inspection

The PPE inspection program will entail five different inspections:

- o Inspection and operational testing of equipment received from the factory or distributor.
- o Inspection of equipment as it is issued to workers.
- o Inspection after use.
- o Periodic inspection of stored equipment.
- o Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The inspection checklist is provided in Table 7.4.1. Records will be kept of all inspection procedures. Individual identification numbers will be assigned to all reusable pieces of equipment and records should be maintained by that number. At a minimum, each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records may indicate an item or type of item with excessive maintenance costs or a particularly high level of down-time.

#### 7.5 Storage

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

TABLE 7.4.1  
PPE INSPECTION CHECKLIST  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

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CLOTHING

Before use:

- o Determine that the clothing material is correct for the specified task at hand.
- o Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- o Hold up to light and check for pinholes.
- o Flex product:
  - Observe for cracks
  - Observe for other signs of shelf deterioration
- o If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

During the work task, periodically inspect for:

- o Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- o Closure failure
- o Tears
- o Punctures
- o Seam discontinuities

TABLE 7.4.1 - CONTINUED  
PPE INSPECTION CHECKLIST  
SWALM AVENUE SITE  
NEW CASSEL, NEW YORK

GLOVES

Before use:

- o Pressurize glove to check for pinholes. Either blow into glove, then roll gauntlet toward fingers or inflate glove and hold under water. In either case, no air should escape.

AIR-PURIFYING RESPIRATORS

- o Inspect air-purifying respirators:
  - before each use to be sure they have been adequately cleaned
- o Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion
- o Examine cartridges to ensure that:
  - they are the proper type for the intended use
  - the expiration date has not been passed
  - they have not been opened or used previously
- o Check faceshields and lenses for:
  - cracks
  - crazing
  - fogginess
- o Air purifying respirators will be stored individually in resealable plastic bags.

### Clothing:

- o Potentially contaminated clothing will be stored in an area separate from street clothing.
- o Potentially contaminated clothing will be stored in a well-ventilated area, with good air flow around each item, if possible.
- o Different types and material of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake.
- o Protective clothing will be folded or hung in accordance with manufacturer's recommendations.

### Respirators:

- o Air-purifying respirators should be dismantled, washed, and placed in sealed plastic bags.

### 7.6 Maintenance

Specialized maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to which the equipment is assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

### 7.7 Decontamination Methods

All personnel, clothing, equipment, and samples leaving the contaminated (work zone) area of the site must be decontaminated to remove any harmful chemicals or infectious organisms that may have adhered to them. Decontamination methods either (1) physically remove contaminants (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination

of both physical and chemical means. In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water.

All used PPE to be discarded will be placed in a 55-gallon drum and stored in a secure place at the site while awaiting final disposition.

The effectiveness of the decontamination will be evaluated near the beginning of site activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

**SECTION 8.0**  
**DECONTAMINATION PROCEDURES FOR**  
**SAMPLING AND DRILLING EQUIPMENT**

All sampling equipment shall be decontaminated prior to, and following, use at each soil sampling location. Decontamination procedures shall consist of the following:

1. Scrub equipment in a bath of low-phosphate detergent and potable water.
2. Potable water rinse.
3. 1% nitric acid rinse.
4. Potable water rinse.
5. Methanol followed by hexane rinse.
6. Distilled water rinse, air dry.
7. Aluminum foil wrap, shiny side out, for transport.

Personal protective equipment decontamination has been discussed in Subsection 7.7.

**SECTION 9.0**  
**CALIBRATION PROCEDURES, FREQUENCIES, AND MAINTENANCE**

This section will present the calibration procedures, frequencies, and maintenance for the health and safety field monitoring instruments.

The use of the monitoring equipment is presented as follows (the manufacturer's owner's manuals for all equipment used will be present at the site):

1. Photovac MicroTIP - this instrument is a photoionization detector (PID) that measures the concentration of airborne ionizable gases and vapors. The MicroTIP does not distinguish between individual compounds and will not read methane. The calibration will be performed with a cylinder of "zero gas" (hydrocarbon free air) to "zero" the instrument and a 100 ppm cylinder of isobutylene to calibrate the span.

The calibration procedures and frequencies for each instrument are presented as follows:

Photovac MicroTIP (Photoionization Detector)

Isobutylene at 100 ppm in air will be used as Span Gas. A commercial zero grade gas will be used as the zero gas. To calibrate the instrument, use the Calibration Kit (Photovac Part No. 390033) as follows:

1. Connect the supplied regulator to the Span Gas cylinder. Hand tighten the fittings.
2. Open the valve on the gas bag by turning the valve stem fully counter clockwise.
3. Attach the gas bag adapter nut to the regulator. Hand tighten the fittings.

4. Turn the regulator knob counter clockwise about half turn to start the flow of gas.
5. Fill the gas bag about half full and then close the regulator fully clockwise to turn off the flow of gas.
6. Disconnect the bag from the adapter and empty it. Flush the bag a few times with the Span Gas and then fill it.
7. Close the gas bag by turning the valve clockwise.
8. Press SETUP and select the desired Cal Memory with arrow keys and press ENTER. Press EXIT to leave Setup.
9. Press CAL and expose MicroTIP to Zero Gas. Press ENTER and MicroTIP sets its zero point.
10. MicroTIP then asks for the Span Gas concentration. Enter the Known Span Gas concentration and then connect the Span Gas bag adapter to the inlet.
11. Press ENTER and MicroTIP sets its sensitivity.
12. When MicroTIP's display reverts to normal, MicroTIP is calibrated and ready for use. Remove the Span Gas bag from the inlet.

The instrument will be calibrated prior to the commencement of each day's work. The instrument will be charged overnight prior to each day's work.

## SECTION 10.0 EMERGENCY RESPONSE PLAN

This section will present the Emergency Response Plan (ERP) for the site. Pre-emergency planning will consist of reviewing the ERP with all workers at the site prior to initiation of work.

### Personnel Roles

It is anticipated that during the drilling and well installation activities at the site, in general, three persons will be on the site: The HSO, the driller, and the driller's assistant. Should an emergency situation arise at the site, the HSO will assume control and decision-making. The HSO will also resolve all dispute concerning health and safety requirements and precautions. The HSO will also:

- o Be authorized to seek and purchase supplies as necessary.
- o Have control over activities of everyone entering the site.

The HSO will communicate, by field telephone or other, with off-site personnel to include the Project Manager to evaluate data and assist in the decision-making process. Phone numbers for the fire department, police, ambulance, poison control center, Nassau County Department of Health, NYS Department of Environmental Conservation Spill Response Department, are listed on the next-to-last page of this document. The hospital which will be utilized during an emergency will be Nassau County Medical Center. The directions to the hospital, along with the hospital's emergency room phone number are presented on the last page of this document.

Copies of the last page of this document will be available at the site and will be placed in all vehicles of personnel involved in activities at the site.

Internal communications will consist of a single whistle (or compressed air horn if Level C is donned) blast. This blast will signal all workers to evacuate the work zone by the nearest exit.

#### Response Follow-Up

Following an emergency, or incident, a detailed report will be generated by the HSO. All equipment will be restored to pre-emergency conditions. The HASP will be reviewed following an emergency to determine if it provides adequate information to assist in dealing with the emergency. The HASP may be revised to incorporate additional information as needed.

#### Emergency Recognition and Prevention

Before daily work assignments begin, each day a brief on-site meeting will be held by the HSO which will address health and safety issues related to the day's work. Prior to initiation of work, a detailed on-site health and safety meeting will be held to review all potential hazards, contingencies, and safety measures.

#### Safe Distances and Places of Refuge

The main potential cause of work zone evacuation is a significant vapor release. Vapor release evacuation will be discussed prior to drilling at each site and in general will be in the upwind direction. Wind direction will be monitored at each work location and all workers will be notified of the direction of evacuation prior to commencement of work. Safe distances will be discussed at each location and determined by the HSO. The OVA will be used to determine if workers have evacuated a sufficient distance.

At all times, vehicles which may be utilized in an emergency for transport to the hospital (or other destination) will have clear access

to leave the site. The HSO will assure that an emergency vehicle does not become blocked-in by other vehicles.

#### Site Security and Control

The HSO will control entry of personnel into the work zone. No unnecessary person shall be permitted in the work zone.

#### Decontamination Procedures During Emergencies

In the event of a medical emergency, decontamination will be performed if it does not interfere with essential treatment. Decontamination will be performed by washing, rinsing, and/or cutting off protective clothing and equipment.

If decontamination cannot be performed, the victim will be wrapped in plastic to reduce contamination to other personnel. Emergency and off-site medical personnel will be alerted to the potential contamination.

#### Emergency Medical Treatment and First Aid

Medical emergencies will be treated, in general, by medical experts by transporting the victim to the nearby hospital.

A first aid kit will be present on site for minor medical treatment.

**APPENDIX A**  
**EMERGENCY TELEPHONE NUMBERS,**  
**FANNING, PHILLIPS AND MOLNAR'S CONTACT PERSONNEL,**  
**DIRECTIONS FROM SWALM AVENUE TO THE HOSPITAL**

TABLE A.1

Emergency Telephone Numbers

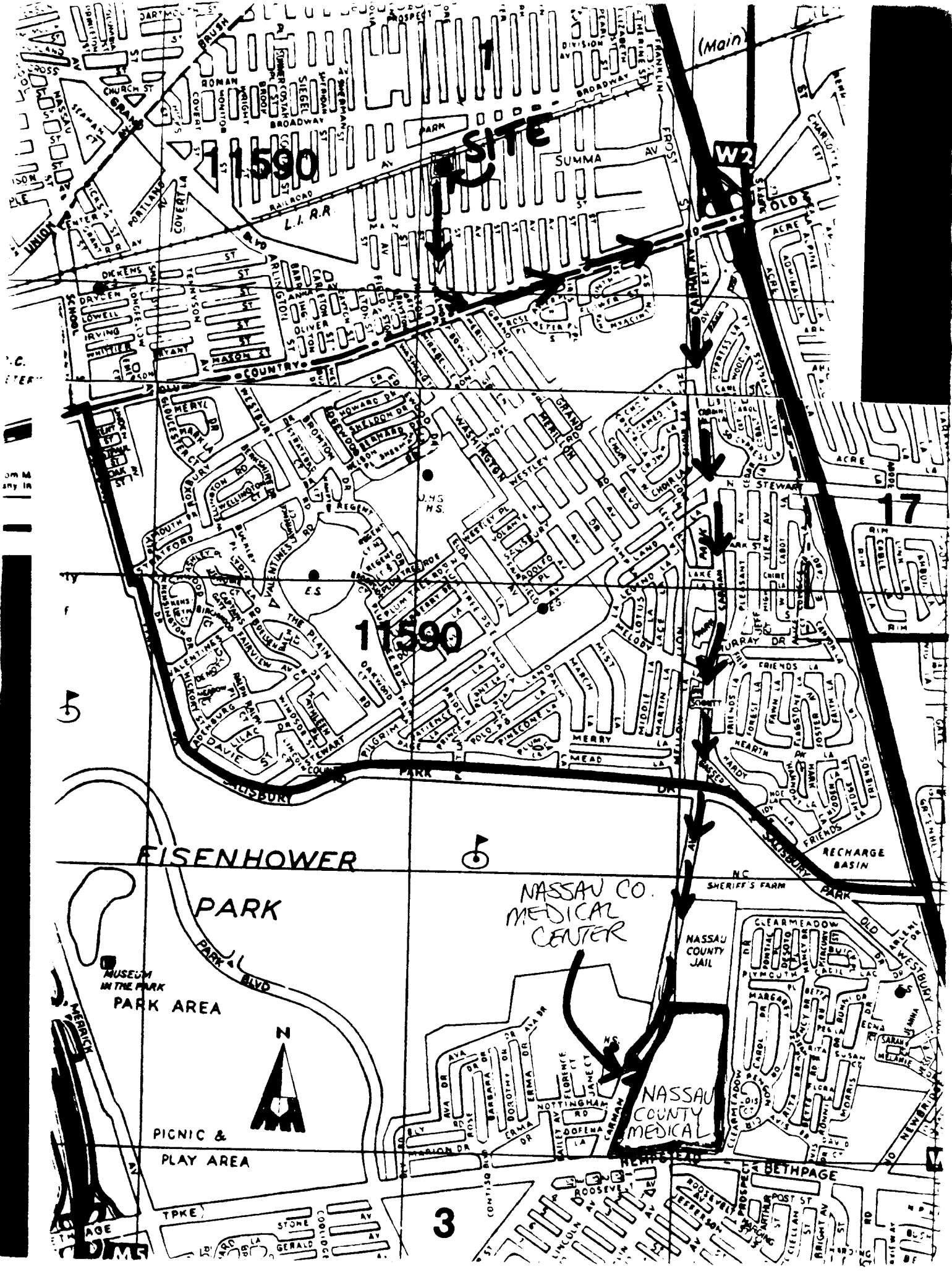
|                                                 |                   |
|-------------------------------------------------|-------------------|
| New York City Police                            | 911               |
| Ambulance                                       | 911               |
| Poison Control Center                           | 1-516-542-2323    |
| Department of Health Services                   | 1-516-571-2672    |
| N.Y.S. Department of Environmental Conservation | 1(516)444-0320    |
| (Chemical Spills)                               | or 1-800-457-7362 |
| Nassau County Medical Center Emergency          | 1-516-572-6655    |

FP&M Contact Personnel (737-6200)

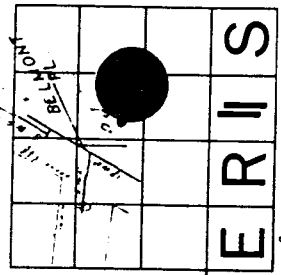
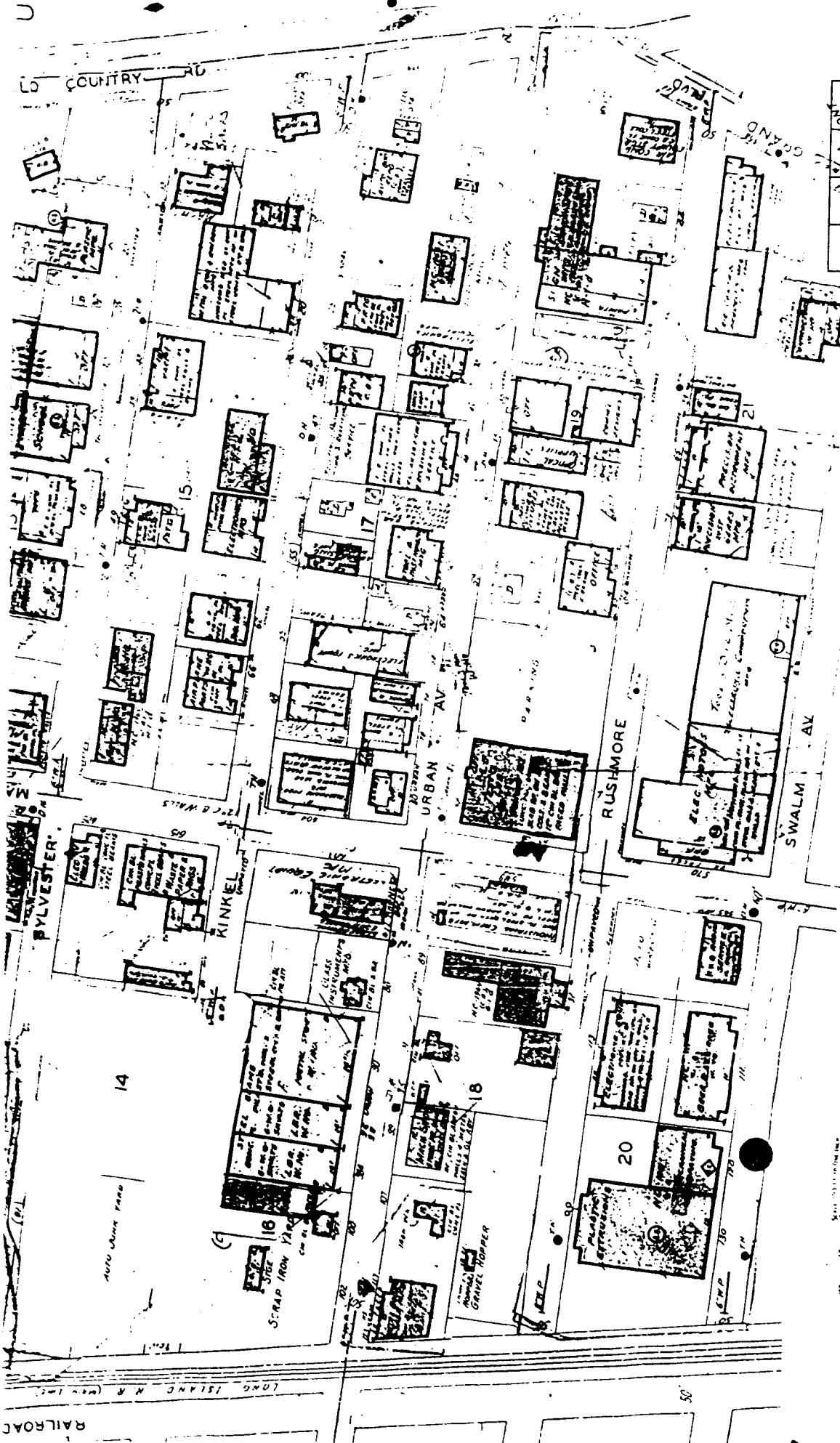
Dr. Kevin J. Phillips, P.E.  
Peter Dermody, Project Manager  
William P. Keenan/Hydrogeologist/Health & Safety Officer

Directions to Nassau County Medical Center (1-516-572-6655)

Take Swalm Avenue South (away from train tracks) two blocks. Make a left on Grand Blvd. to Old Country Road. Make a left on Old Country Road (east) to Carman Avenue. Make a right on Carman Avenue (south). Carman Avenue is before the Wantagh State Parkway. Nassau County Medical Center (NCMC) is on the left side of Carman Avenue after the Nassau County Jail. NCMC is on the corner of Hempstead Turnpike (24) and Carman Avenue.



**APPENDIX B**  
**1968 SANBORN MAP**



SANBORN

# Environmental Risk Information & Imaging Services

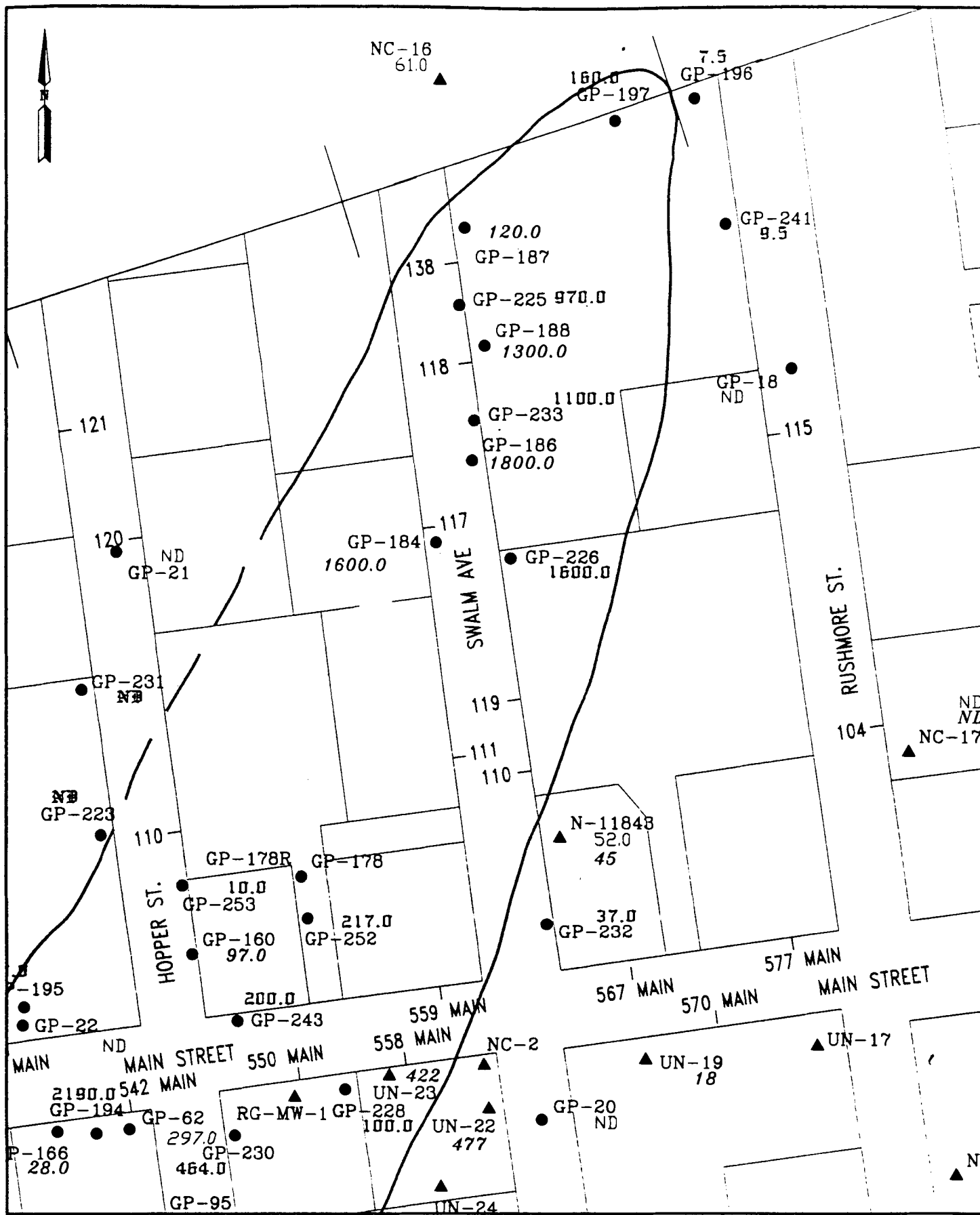
505 Huntmar Park Drive, Suite 200 ■ Herndon, VA 20170 ■ (703) 834-0600 ■ (800) 989-0403 ■ FAX (703) 834-0606

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**APPENDIX C**  
**GROUNDWATER SAMPLING RESULTS MAPS FROM 1997 LMS REPORT**



NOTE: All data in ug/l.

Scale in Feet

120 0 120



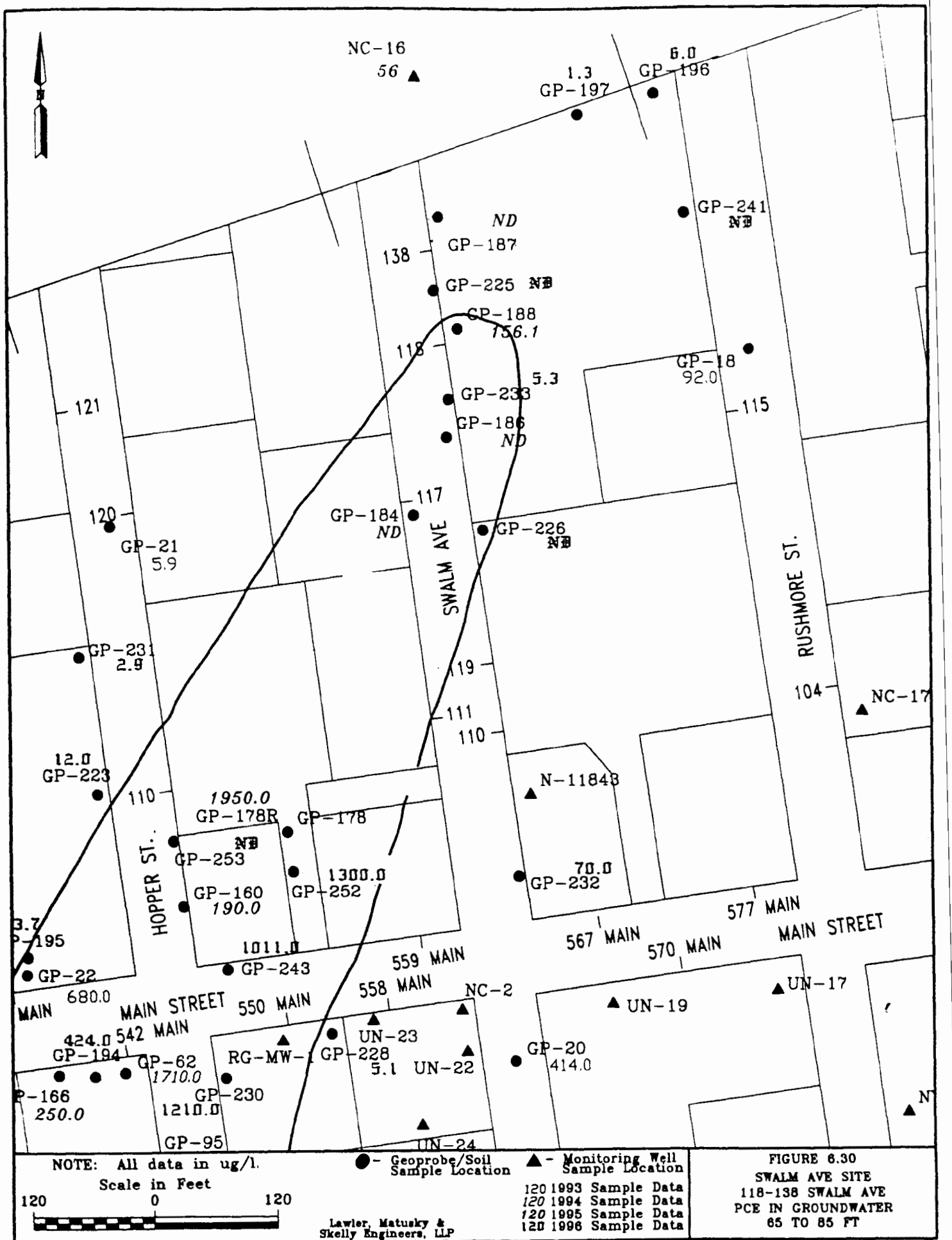
Lawler, Matusky & Skelly Engineers, LLP

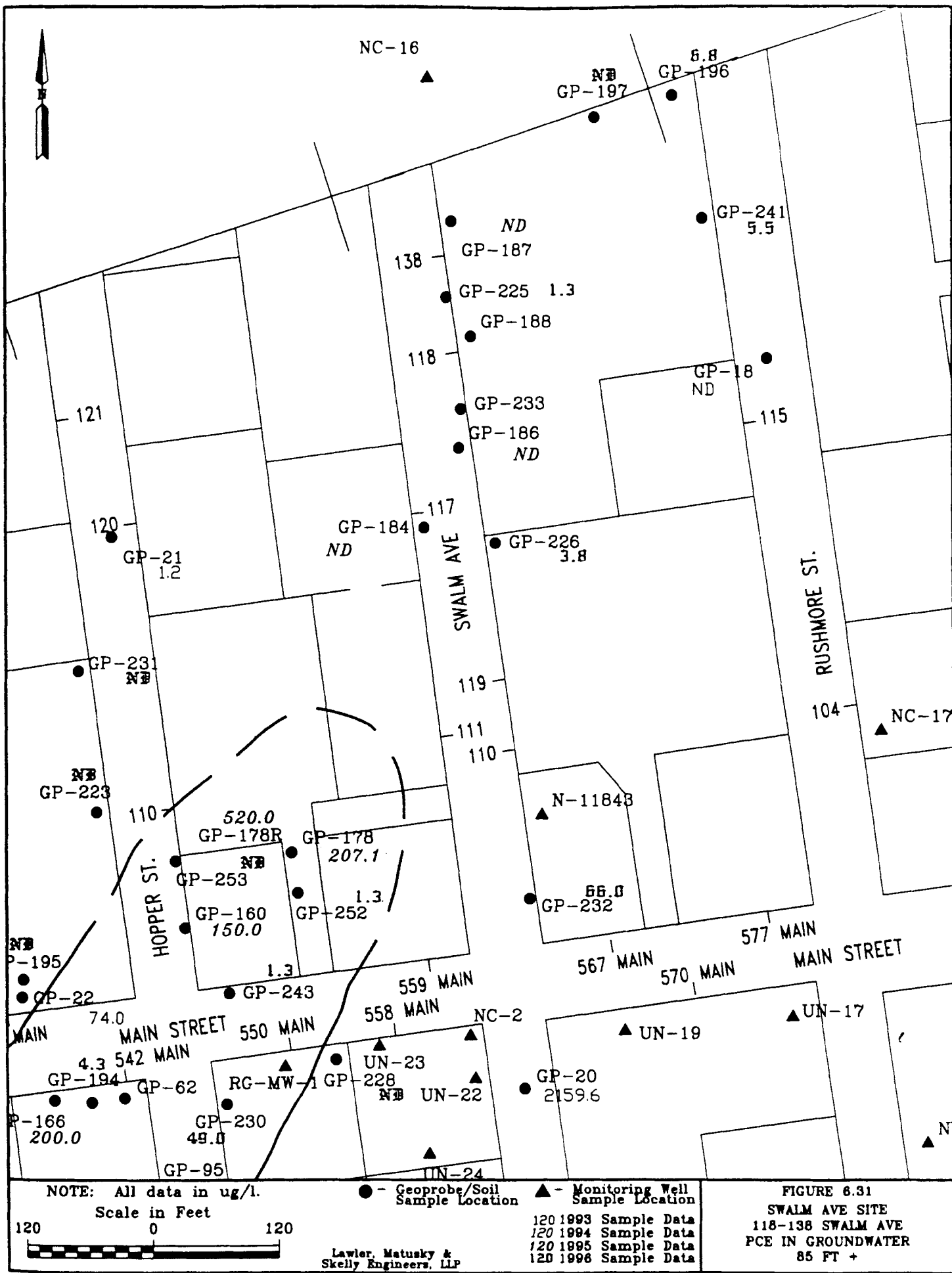
● - Geoprobe/Soil Sample Location ▲ - Monitoring Well Sample Location

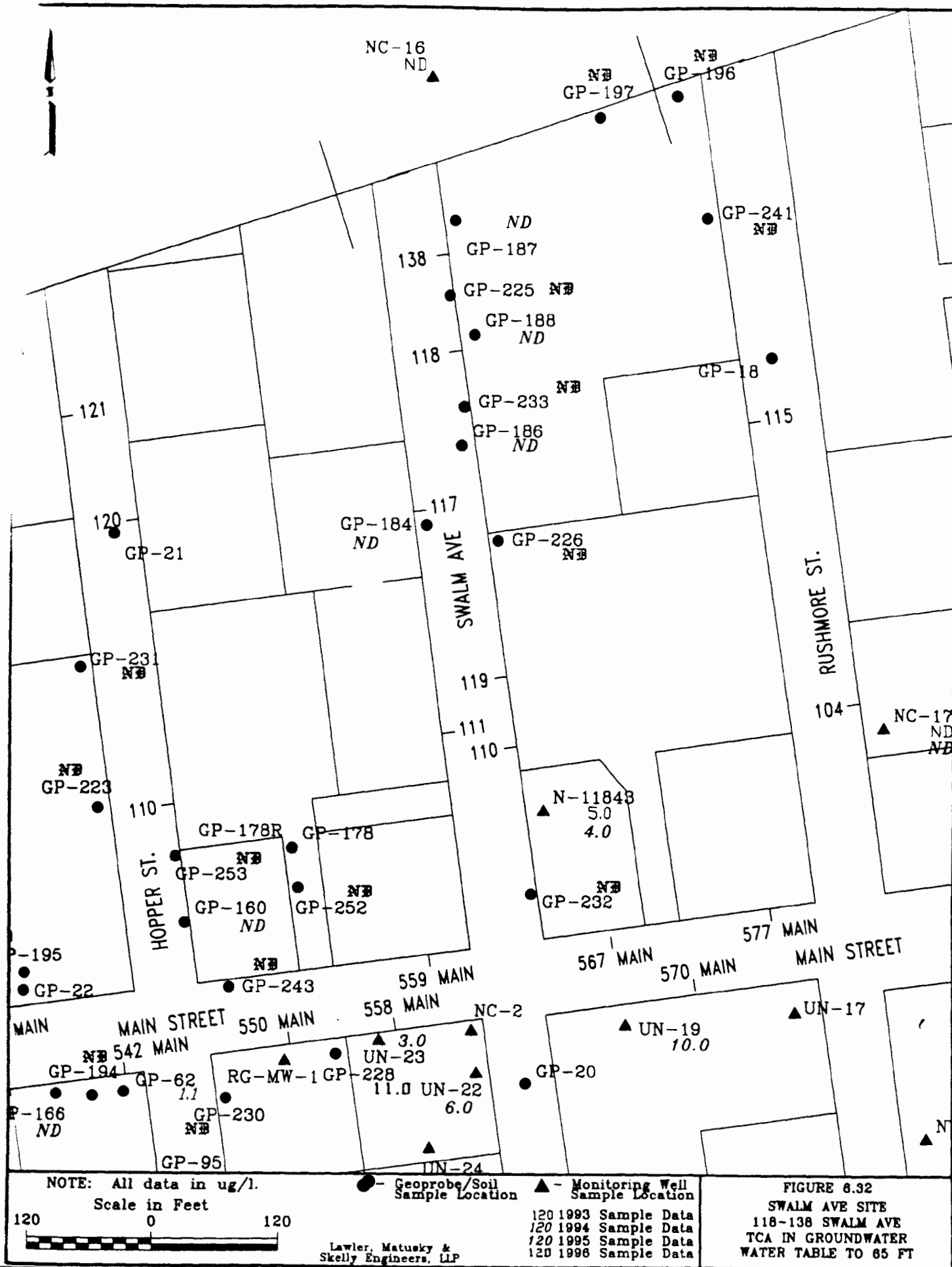
120 1993 Sample Data  
120 1994 Sample Data  
120 1995 Sample Data  
120 1996 Sample Data

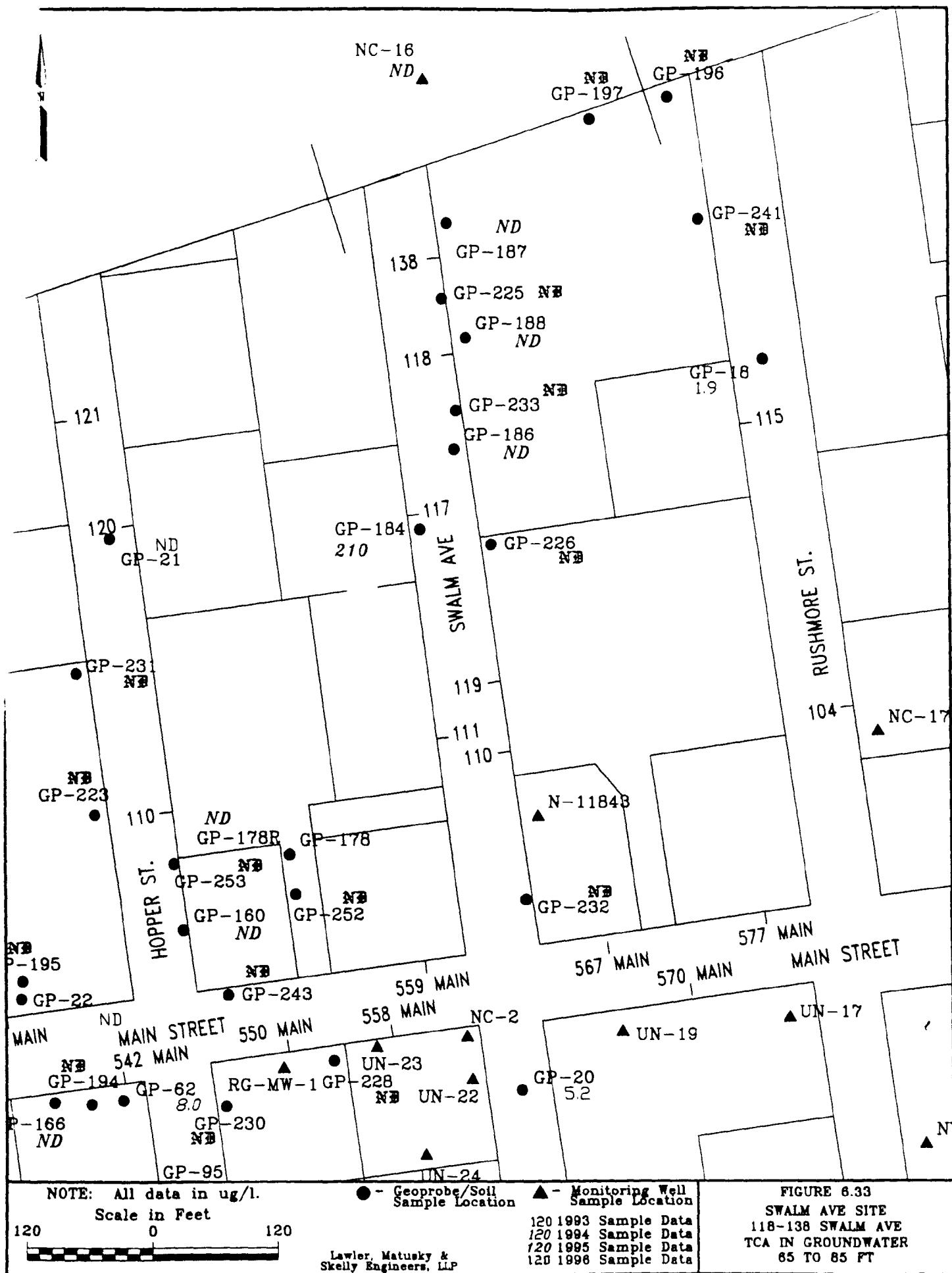
FIGURE 6.29

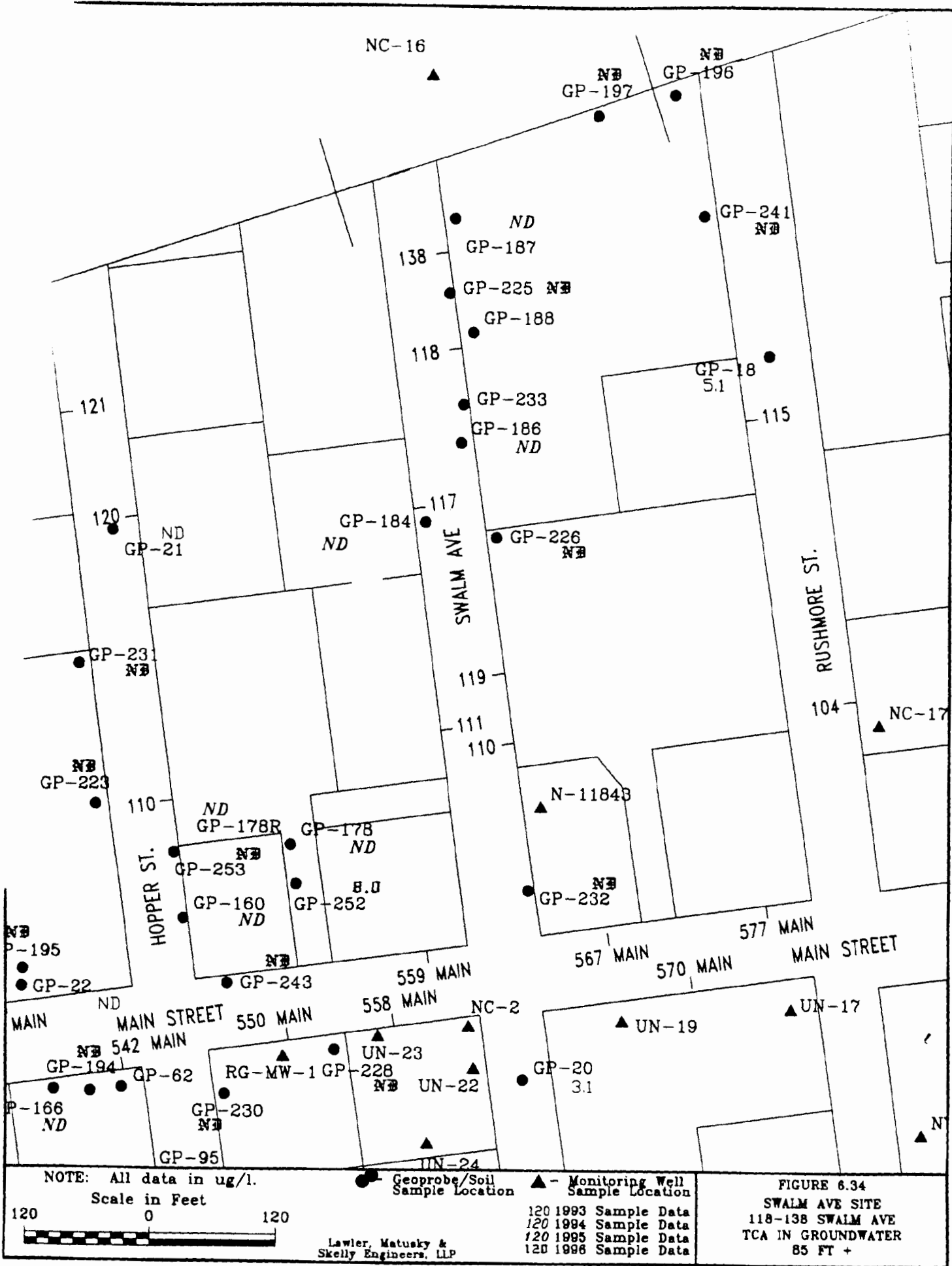
SWALM AVE SITE  
118-138 SWALM AVE  
PCE IN GROUNDWATER  
WATER TABLE TO 65 FT











**APPENDIX D**

**QAO RESUME**

**STEPHANIE O. DAVIS, C.P.G., R.G., P.G.**  
**Senior Hydrogeologist**

**Experience Summary**

Ms. Davis has diversified experience in geology and hydrogeology. Her professional experience includes groundwater and soil investigations, design and management of soil remediation projects, design and installation of groundwater containment and remediation systems, groundwater flow modeling, aquifer testing and interpretation, evaluation of site compliance with environmental regulations, environmental permitting, and personnel training. Ms. Davis is a Registered Geologist in the States of California and Pennsylvania and is also registered as a Certified Professional Geologist (CPG).

**Education**

M.S. Geology / University of Southern California 1984  
B.S. Geology / Bucknell University 1981

**Associations/Certifications**

OSHA 40-hour and Current 8-hour Health and Safety Training and Current Annual Physical  
Certified Professional Geologist #9487, 1995  
Pennsylvania Registered Geologist #PG-000529-G, 1994  
California Registered Geologist #5192, 1991  
Geological Society of America  
National Ground Water Association  
Long Island Geologists  
American Institute of Professional Geologists

**Employment History**

1993-Present Fanning, Phillips and Molnar  
1992-1993 Chevron Research and Technology Co.  
1990-1992 Chevron Manufacturing Co.  
1984-1990 Chevron Exploration, Land and Production Company

**Continuing Education**

- Treatment of Contaminated Soil and Rock
- Groundwater Pollution and Hydrology
- Environmental Law and Regulation
- Remedial Engineering
- Soil and Foundation Engineering

**Key Projects - Site Investigations**

Managed on-site and off-site soil and groundwater sampling program at a manufacturing facility in Bay Shore, New York. Compiled resulting data and prepared a comprehensive report of the investigation results for the Suffolk County Department of Health Services (SCDHS) and NYS Department of Environmental Conservation (NYSDEC). Proposed remediation technologies for on-site soil contamination and on-site and off-site groundwater contamination.

Managed and conducted a soil and groundwater sampling program using a Geoprobe sampler adjacent to the Newark Airport Runway 29 for the Federal Aviation Administration. Analyzed resulting chemical data and prepared a report.

Participated in soil and groundwater sampling using a Geoprobe sampler at a manufacturing facility in Suffolk County, New York. Compiled, reviewed, and presented the resulting chemical analytical data to the client.

Managed site investigation activities, including soil vapor sampling, soil sampling and analysis, groundwater sampling and analysis, and geotechnical evaluation for sites in Commack and Miller Place, NY. The resulting data were utilized by a major supermarket company in the negotiations for the purchase of the properties and in the property remediation prior to development.

Supervised drilling, installation, development, and sampling of monitoring wells at two commercial sites in Farmingdale, New York. Utilized resulting stratigraphic, hydrologic, and chemical analytical data to evaluate site conditions.

Supervised and conducted drilling, soil sampling, cone penetrometer testing, and well installation at Chevron Corp. refinery process water effluent treatment system and a City of Richmond former municipal landfill.

Remediation - Designed soil remediation plan and managed contractor support for a metal parts plating and manufacturing facility in Suffolk County, New York. Soil remediation was overseen and approved by the SCDHS.

Designed and performed indoor underground storage tank abandonment program, leaching pool remediation plan, and managed contractor support for a tape measure manufacturing facility in Suffolk County, New York. SCDHS provided oversight and approval.

Participated in the design process and coordinated technical aspects of a groundwater containment and remediation system for a City of Richmond former municipal landfill, including subsurface groundwater barrier walls and extraction wells.

Designed soil remediation plan and supervised contractor performance of soil remediation activities at an active construction site in Carle Place, NY. Project involved excavation and disposal of approximately 5,000 tons of PCB-, metal-, and petroleum-contaminated soil. NYSDEC provided oversight and approval of the completed remediation.

Hydrogeologic Evaluations - Supervised drilling, installation and development of groundwater extraction, injection, and monitoring wells at a USEPA Superfund site in Deer Park, NY. Interpreted aquifer and well performance from development data and made recommendations for modification of drilling and development procedures.

Performed water level and water quality monitoring at an industrial site in Mattituck, NY. Constructed groundwater elevation contour maps and utilized chemical analytical data to predict contaminant plume migration.

Used the PC-based modeling program FLOW PATH to predict groundwater flow directions and evaluate extraction well locations and pumping rates for a groundwater containment and remediation system at a City of Richmond former municipal landfill.

Performed slug tests on monitoring wells at New York City Transit Authority sites, and evaluated hydrologic properties using the HYDROLOGIC ISOAUX computer program.

Performed aquifer pumping and slug tests and evaluated hydrologic properties using the computer program AQTESOLV.

Other - Performed numerous Phase I Environmental Site Assessments for residential and industrial sites on Long Island, New York.

Instructed classes for site investigation methods, aquifer pumping test analysis, soil vapor extraction tests, and risk assessment.

Performed various project management functions, including development and management of project budgets and schedules, coordination of field and office staffing, document preparation, review, editing, and interaction with clients, regulatory, legal, real estate, consultant, and compliance personnel.