RI/FS WORK PLAN
FOR THE KENMARK TEXTILE SITE
IN FARMINGDALE, NEW YORK
FOR COMPLIANCE WITH USEPA ADMINISTRATIVE
ORDER ON CONSENT
RI/FS INDEX NO. II CERCLA-10204

PREPARED FOR
SJ&J SERVICE STATIONS, INC.

JANUARY, 1992

fanning, phillips & molnar
ENGINEERS
RONKONKOMA · NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

January 13, 1992

Mr. Martin O. Klein, C.P.G.
Department Manager
Geohydrology
Fanning, Phillips & Molnar
909 Marconi Avenue
Ronkonkoma, New York 11779

Re: Kenmark Textiles Printing Corporation Superfund Site
Index No. II CERCLA - 10204

Dear Mr. Klein:

This letter transmits our approval of the January 1992 Remedial Investigation/Feasibility Study ("RI/FS") Work Plan for the above referenced site.

Please send four copies of the final Work Plan to New York State. The number of copies to be sent to EPA remains as specified in the Administrative Order on Consent.

As discussed in our January 13, 1992 telephone conversation, the Sampling and Analysis Plan and the Health and Safety Plan will be submitted to me by January 24, 1992.

Should you have any questions, please contact me at (212) 264-0722.

Sincerely yours,

Sharon Trocher

Sharon Trocher
Remedial Project Manager
Eastern New York and Caribbean Section I

cc: Joseph B. Lamberta, Esq.
Douglas Fischer, Esq., EPA
Douglas Garbarini, EPA
Jonathan Greco, NYSDEC

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SECTION 1.0
INTRODUCTION

1.1 OVERVIEW OF THE PROBLEM

This Remedial Investigation/Feasibility Study (RI/FS) work plan is presented in compliance with the Administrative Order on Consent (AOC), Index No. II CERCLA-10204 (Reference 1), pertaining to the Kenmark Textiles site (the "Site")in Farmingdale, New York (see Figure 1.1.1 for Site location).

The Site was placed on the New York State Inactive Hazardous Waste Disposal Site Registry as a Class 2 Site in 1985, and the National Priority List (NPL) in 1986 due to alleged violations of the State Pollution Discharge Elimination System (SPDES) Law. SPDES violations were cited in the past due to the alleged discharges of partially treated waste to a leaching pit on the Site.

The manufacturing process that occurred at the Site was textile printing. The history of sampling and analysis of the alleged supernatant discharges that flowed from the flocculation treatment tank into the leaching pit has shown one or more alleged violations of New York State Department of Environmental Conservation (DEC) Class GA Groundwater Standards for COD, pH, MBAS, dissolved solids, suspended solids, chloride, phenols, copper, iron, chromium (Hexavalent), silver, and lead.

Soil samples obtained by the DEC in 1985 from the pump house basin (sump beneath flocculation tank), sludge drying beds and leaching pit were reported with the presence of cadmium, chromium, copper, zinc, arsenic, lead, mercury, nickel, and silver. No volatiles, base neutrals, or acid extractables were detected.

Through a cooperative agreement between the United States Environmental Protection Agency (EPA) and DEC, the DEC was designated as the lead agency for the RI/FS oversight. In April, 1987, the DEC requested a work plan for the RI/FS. A RI/FS work plan was prepared by Fanning, Phillips and Molnar and submitted to the DEC in May, 1987. Subsequently, the plan was revised and approved by DEC in May, 1988. The plan (Reference 2) was

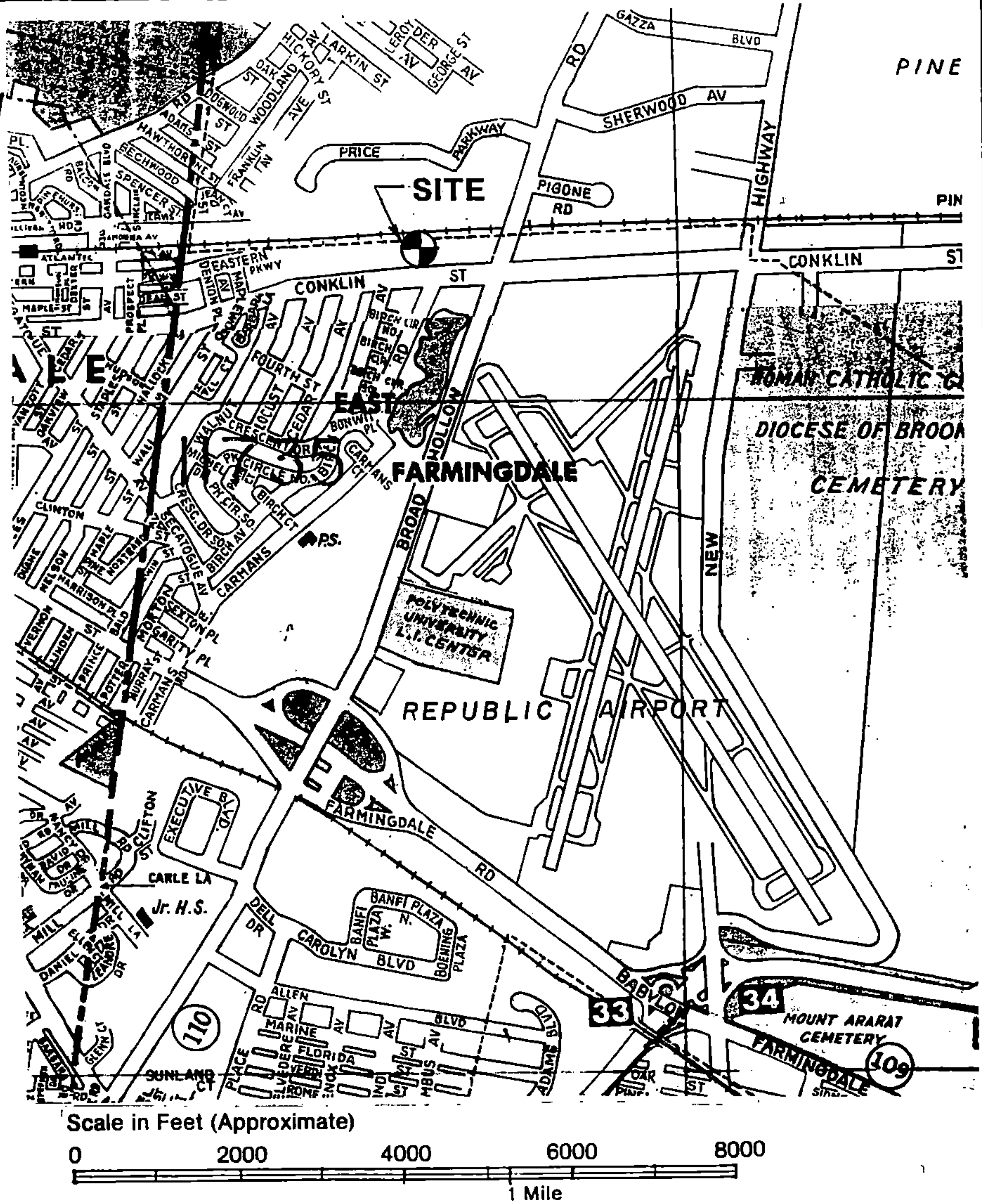

FIGURE 1.1.1 – SITE LOCATION

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implemented and the results of the RI were presented in a report entitled "RI/FS Phase I Sampling Report - March, 1989" (Reference 3). In January, 1990, comments to the RI/FS Phase I Sampling Report - March, 1989 (Reference 3), were transmitted to Fanning, Phillips and Molnar by DEC. The comments provided by DEC were jointly expressed by DEC, EPA, and NYSDOH. In response to these comments, Fanning, Phillips and Molnar revised the RI/FS report (Reference 4) and resubmitted it to DEC in July, 1990. In August, 1990, Fanning, Phillips and Molnar submitted a follow-up RI work plan to DEC for approval (Reference 5). Also, in August, 1990, the EPA assumed lead-agency status for the project and is administering the project under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). An AOC was signed by SJ&J Service Stations, Inc., the owner of the Site, on July 30, 1991, to initiate the EPA-lead RI/FS process.

1.2 APPROACH AND DEVELOPMENT OF WORK PLAN

The overall project objective of this RI/FS is to determine the presence, release, or potential release of hazardous substances, pollutants or contaminants produced by prior operations at the Site and to evaluate alternatives for remedying any resulting problem(s). The RI will include the collection of data necessary to determine the distribution of contaminants, to identify contaminant migration pathways, to identify cleanup criteria, and to support the remedial alternative evaluation, as necessary. The FS will seek to develop and evaluate remedial action alternatives which protect the public health and the environment, and which attain or exceed Applicable or Relevant and Appropriate Requirements (ARARs) for compliance with the National Contingency Plan (NCP).

This work plan presents Fanning, Phillips and Molnar's proposed technical scope of work for the RI/FS as well as the detailed schedule for the performance of the work. Descriptions of the responsibilities and the professionals expected to play significant roles in the RI and FS have also been included.

This work plan has been prepared in accordance with current EPA guidance. The following are several of the documents (References 6 to 17) applicable to the preparation and execution of an RI/FS (additional EPA Guidance Documents will be cited as needed):

- Interim Final Guidance for Conducting RI/FS under CERCLA (OSWER Directive No. 9355.3-01);
- Test Methods for Evaluating Solid Waste ("SW846") (November, 1986, or as updated);
- Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, EPA QAMS-005/80;
- Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring (EPA, Office of Water Regulations and Standards, May, 1984);
- National Enforcement Investigations Center Policies and Procedures Manual, as revised in November, 1984;
- National Enforcement Investigations Center Manual for the Evidence Audit, published in September, 1981;
- Data Quality Objectives: development guidance for uncontrolled hazardous waste site remediation response activities (EPA, 1987);
- Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites (OSWER Directive No. 9283.1-2);
- Superfund Exposure Assessment Manual (OSWER Directive No. 9285.5-1);
- Treatment Potential for 56 EPA Listed Hazardous Chemicals in Soils, February, 1988 (EPA/600/6-88/001);
- Review of In-place Treatment Techniques for Contaminated Surface Soils - Volume 1: Technical Evaluation, September, 1984 (EPA-540/2-84-0030); and
- Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Parts A and B), December, 1989 (EPA/540/1-89/002).

Preparation of the work plan was based upon a review and consideration of data, information and discussions related to the following sources:

USEPA Files
USDOA, Soil Conservation Service
USDOA, Forest Service
USDOI, Bureau of Reclamation
Federal Emergency Management Agency
National Oceanic & Atmospheric Administration
State Fish and Wildlife Agencies
County or City Health Departments
Local Airport
Local Well Drillers
Local Water Authorities
Regional Geologic & Hydrologic Publications
Facility Owners and Employees
Site Visit Reports
Field Investigation Analytical Data
U.S. Geological Survey
USDOA, Agricultural Stabilization & Conservation
USDOI, Fish and Wildlife Agencies
US Army Corps of Engineers
US Census Bureau
State Geological Survey
Local Planning Boards
Town Engineer or Town Hall
Local Library
Sewage Treatment Plants
City Fire Departments
Facility Records
Waste Haulers and Generators
Aerial Photographs

1.3 WORK PLAN CONTENT

This work plan contains sections of which this introduction is Section 1.0. Section 2.0 describes the site background, including the current understanding of the location, history and existing condition of the Site. Section 3.0 presents the initial evaluation of existing data. This section (Section 3.0) includes a description of the types and volumes of waste present, site hydrogeology, the migration and exposure pathways, a preliminary assessment of public health and environmental impacts, a preliminary identification of ARARs and remedial action objectives. Section 4.0 presents the work plan rationale, including the Data Quality Objectives (DQOs) for RI sampling and analytical activities, and the approach for preparing the work plan, which illustrates how the activities will satisfy data needs. Section 5.0 presents a discussion of each task of the RI/FS in accordance with the "Interim Final Guidance for Conducting RI/FS under CERCLA," October 1988, OSWER Directive 9355.3-01 (Reference 6). Section 6.0 presents costs and key assumptions. Section 7.0 presents the anticipated schedule for the RI/FS tasks. Section 8.0 presents project management considerations that define relationships and responsibilities for selected tasks and project management teams. Section 9.0 provides a list of references used to develop material presented in this work plan. Section 10.0 provides glossary of abbreviations and definition of terms used in this work plan.

SECTION 2.0
SITE BACKGROUND AND SETTING

2.1 SITE LOCATION

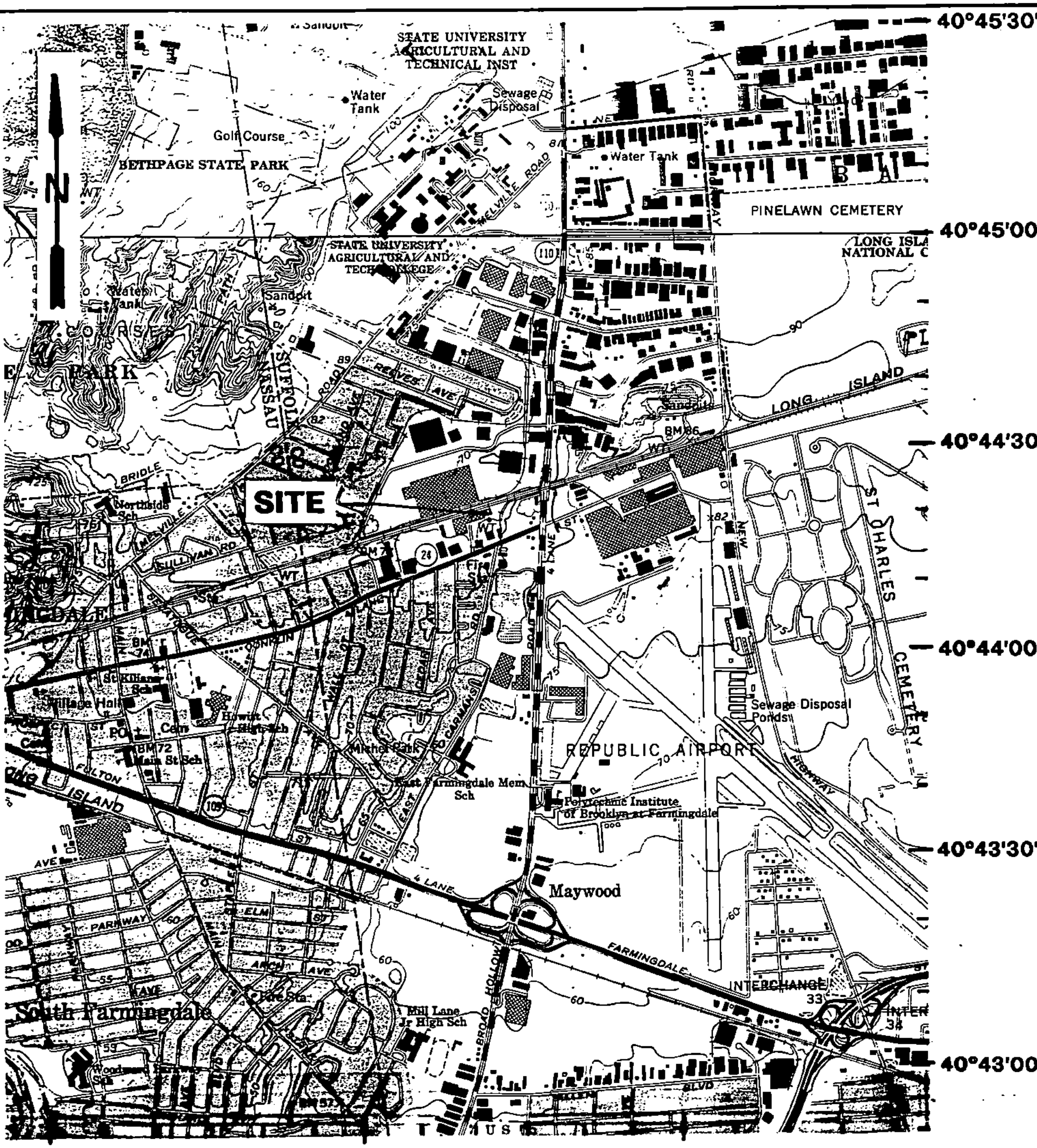
The Site is situated in a light industrial area and consists of an industrial facility located at 921 Conklin Street in the Town of Babylon, New York (see Figure 2.1.1 for site location). The area north and east of the site is also characterized by light industry, including Fairchild Republic, which is located within one-half mile of the Site. Residential developments are located to the south and west, with approximately 10,000 residents living within a one mile radius of the Site. The other notable feature evident on Figure 2.1.1 is the artificial (man-made) pond located 0.2 miles south of the Site. The area occupied by this pond was a former sand and gravel operation. It was subsequently used as an industrial effluent recharge basin by industries on the Fairchild Republic property and is the subject of a separate DEC superfund investigation.

2.2 SITE HISTORY

The Site has been the location of several textile screening and dyeing operations since at least 1917. The Independent Silk Dyeing Company, Inc., later the Independent Textile Dyeing Company, Inc. (Independent Textile), conducted silk and textile screening operations at the Site from 1917 until the company's dissolution in 1958. During the period that Independent Textile conducted operations at the Site, the company allegedly discharged wastewater into a leaching pit which was located at the Site.

In 1958, Independent Textile sold the Site property to B.G.M. Products, Inc., which in turn sold two parcels of Site property to Joseph Picone in September, 1972. The remainder of the Site property had been sold by B.G.M. Products, Inc. to three individuals in 1964, and following a series of transactions, was purchased by Irwin Schoffman and Brent Associates, Inc. in 1968.

Following the dissolution of Independent Textile in 1958, textile screening and dyeing operations at the Site ceased until approximately 1972, at which time the Jayne Textile



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MINUTE TOPOGRAPHIC MAPS (HUNTINGTON, 1979 AND AMITYVILLE, 1979 QUADRANGLES)

SCALE 1:24 000

1 ½ 0 1 MILE

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FIGURE 2.1.1 – SITE LOCATION

Printing Corporation (Jayne Textile) began conducting screen and textile printing operations at the Site. Figure 2.2.1 depicts the level of treatment that the effluent stream received and the general flow path of each component.

Wastewater generated during the course of Jayne Textile's operations was pumped from a pretreatment tank where chemical flocculants were added inside the building into a wet well (sump) located outside the main building. This sump was housed in a small building (pump house) still present at the site. A flocculation (settling) tank was present on top of the building. Wastewater from the sump was pumped upwards into the settling tank. Alum and ferric chloride was added to the wastewater resulting in solids precipitating out of the wastewater which collected at the tank bottom. The supernatant liquid at the top of the tank was discharged through an underground pipe into a leaching pit 80 feet east of this tank. The sludge was discharged into sludge drying beds that were concrete lined on the bottoms and sides. The sludge drying beds had an underdrain system of porous pipe to draw off excess water from the sludge and discharge it back into the sump.

As early as 1972, Jayne Textile used the on-site sludge drying beds and leaching pits as depositories for sludge and wastewater generated during its industrial processes and are evident in the 1976 aerial photograph in the EPA Historical Site Analysis report (Reference 18). The residual sludge from the settling tank, that was placed in sludge drying beds for final dewatering, was periodically removed from the drying beds and placed in drums. These drums were stored on the Site, south of the main building (see Figure 2.2.2 for site layout). The drums were subsequently removed from the Site.

The supernatant liquid flowed from the flocculation tank to the on-site leaching pit (shown east of the building in Figure 2.2.2) through an underground pipe reported to be metallic (as depicted in Figure 2.2.1). A PVC pipe was uncovered in the vicinity of the suspected metal pipe during the Fanning, Phillips and Molnar 1990 RI. This pipe was found exposed in the leaching pit wall. The pit was enlarged to approximately its present size in 1972 from a previously existing smaller pit in 1972. The 1972 and 1976 aerial photographs

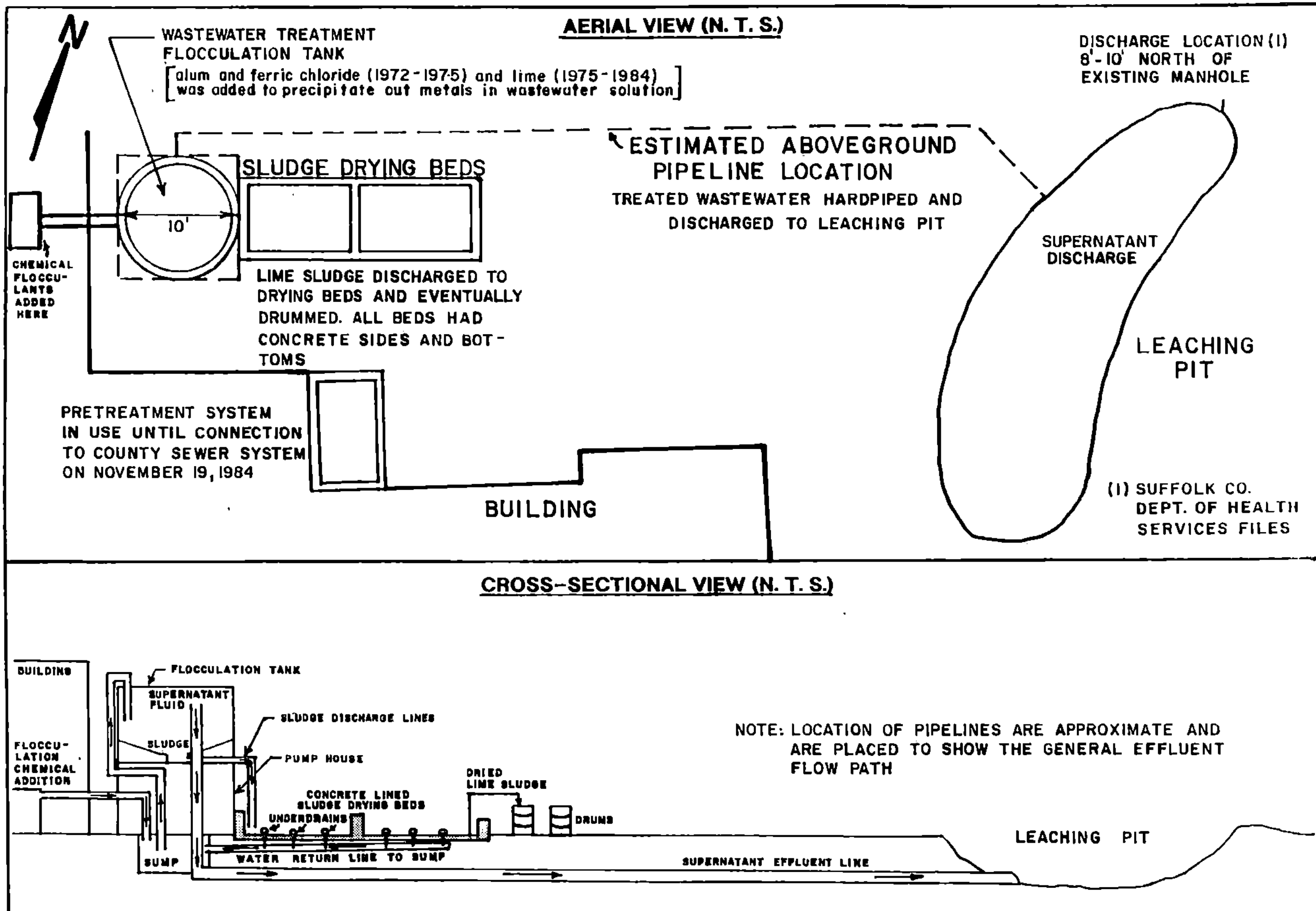

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FIGURE 2.2.1 – SCHEMATIC OF WASTEWATER TREATMENT DESIGN AND LAYOUT AT JAYNE TEXTILE

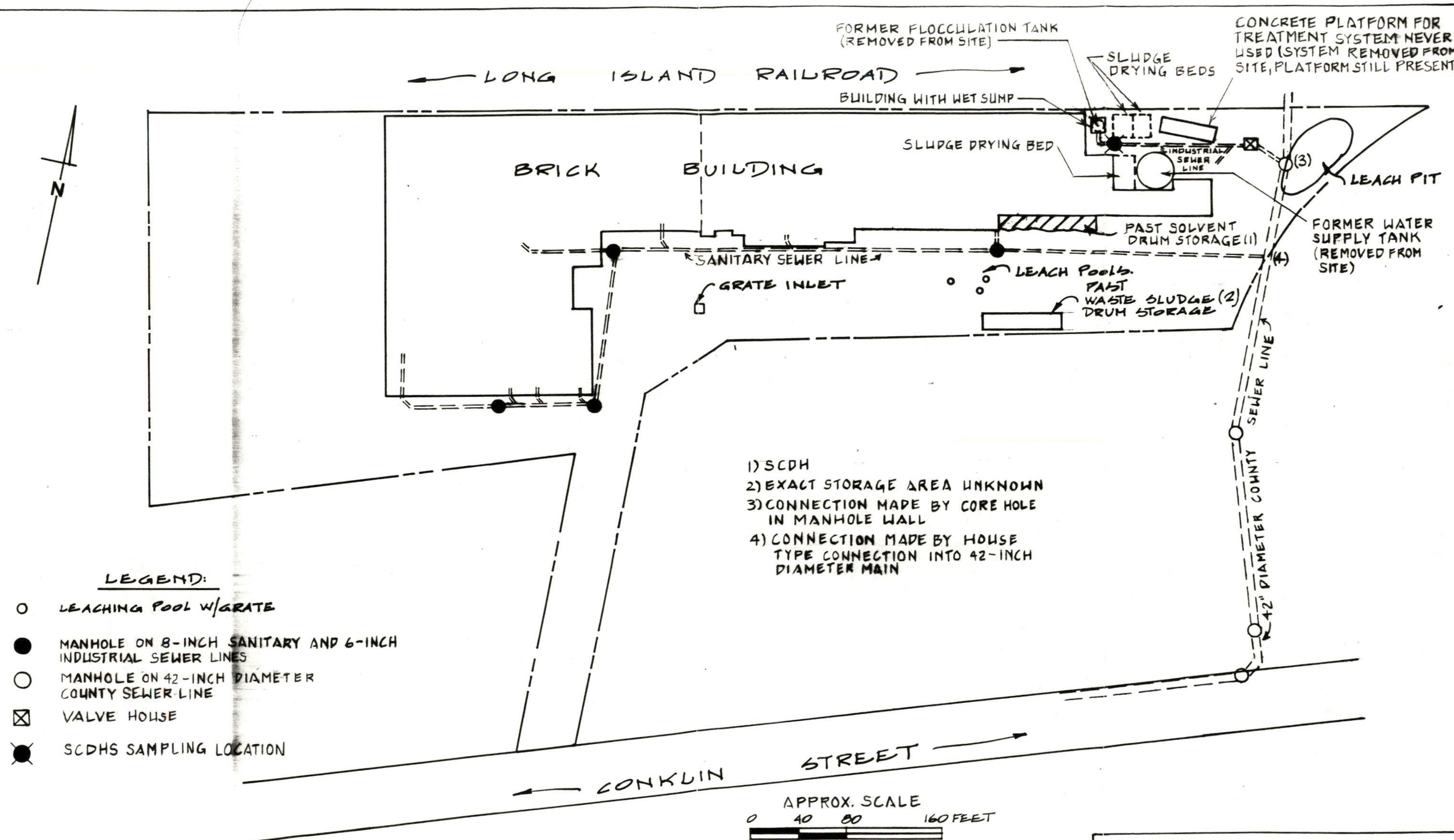

FIGURE 2.2.2

SITE LAYOUT

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in the EPA Historical Site Analysis (Reference 18) show that this pit had a dividing wall in it, resulting in two separate pits within this pit area. Several correspondences regarding the site that refer to multiple pits may be referring to this pit with the dividing wall rather than two separate pits (i.e., DEC Memorandum dated June 24, 1987 to Anthony Candela from Christopher Magee).

A recent interview with an employee at the Site (Reference 19) indicated that the only effluent line that he had knowledge of was of PVC construction. This employee has been at the Site since the mid-1970's. The EPA personnel present also queried this employee on an issue regarding the outside area where the wastewater treatment occurs that was discussed in a DEC Memorandum date June 24, 1987. One issue was a 1972 Suffolk County Industrial Waste Inspection report that claimed that condensate from the steam cooker discharged to the ground surface in the area behind the building. The employee stated that the condensate, to his knowledge, always went into the wash process tanks and that the reference to the discharge to the outside area may refer to the steam relief valve discharge line on the boiler system (clean steam). The area where this discharge occurred was sampled in 1988 and was identified as HB-10. Section 3.2.3 (Discharge Water Section) provides further information.

According to a 1974 SPDES permit application filed by Jayne Textile with the DEC, wastewater generated by Jayne Textile at the Site "may contain" cyanide, cadmium, chromium, copper, lead, and phenols.

In September, 1974, Jayne Textile was notified by DEC that the company was in violation of the New York State Environmental Conservation Law for discharging industrial wastewater into the groundwater without a permit.

On November 1, 1974, Jayne Textile entered into an Order on Consent with DEC which established a time schedule for the implementation of a wastewater treatment system. This Order on Consent was binding on any new corporations which would assume the facility's operations at the Site. Jayne Textile ceased operations at the Site before the Order on Consent was fully complied with.

In 1975, Jayne Textile reorganized into the Kenmark Textile Printing Corporation (Kenmark). The wastewater treatment procedures used by Kenmark at the Site were essentially the same as those used by Jayne Textile, except that Kenmark used lime rather than alum and ferric chloride to treat wastewater generated at the facility. Kenmark also allegedly discharged the supernatant liquid to leaching pits located in the northeast corner of the Site in the same manner as described for the period of time (1972-1975) during which Jayne Textile operated the facility. The leaching pits used at the Site were unlined, thereby permitting alleged wastewater discharges to seep into the surrounding soil. The 1972 and 1976 aerial photos in Reference 18 indicate that the pits were located within one large excavation pit that had a low dividing wall. It is assumed that this is what the various correspondences that refer to multiple pits is targeting. The 1972 photo shows this area to be the only pits present within the vicinity of the site.

Sampling conducted between January, 1974, and May, 1984, by the Suffolk County Department of Health Services (SCDHS) and Lakeland Engineering, a contractor hired by Kenmark Textile, revealed that the wastewater discharged into the on-site leaching pits contained hexavalent chromium, copper, iron, lead, silver, and phenols in violations of New York State GA groundwater effluent standards (see Table 2.2.1).

In 1985, DEC's Mobile Analytical Laboratory obtained soil samples from various locations around the Kenmark Textile facility. Soil samples taken from the facility's pump house basin (sump), leaching pits and sludge drying beds allegedly contained elevated levels of copper, chromium, lead, zinc, silver and arsenic. No volatiles, pesticides, PCBs, base neutrals or acid extractables were detected in this Phase II DEC sampling event. The results of this event are present in Appendix A - Section 3.

Kenmark Textile allegedly stored approximately fifty drums of sludge at the Site for a period of at least five years. Analyses performed on the stored sludge by Lakeland Engineering, a contractor hired by Kenmark, revealed the presence of silver.

Kenmark was notified on numerous occasions by DEC, SCDH and the Suffolk County

TABLE 2.2.1
SUMMARY OF CHRONOLOGICAL WASTEWATER DISCHARGE ANALYSIS
BY S.C.D.H. (1) AND LAKELAND ENGINEERING (2)
SJ&J SITE - FARMINGDALE, NEW YORK

Point of Sampling	Metal Parameters with One or More Readings over State GA Effluent Standards	Other Parameters with One or More Reading over State GA Effluent Standards
Supernatant Discharge to Leaching Pit	Chromium (Hexavalent) (5/20)	Phenol (2/2)
	Copper (2/10)	pH (26/31)
	Iron (17/24)	C.O.D. (22/22)
	Lead (2/13)	MBAS (11/20)
	Silver (1/10)	(3/5) Dissolved Solids
		(21/23) Suspended Solids
		(1/14) Chloride

Note: (2/12) equals number of readings over GA State Standards/per total number of readings.

(1) Analysis over period from January, 1974 - May, 1984

(2) Analysis over period from September, 1979 - September, 1981

Department of Environmental Control (SCDEC) that the company was allegedly in violation of several state and county laws regulating the discharge and storage of hazardous substances and industrial wastes, several Consent Decrees and modified Consent Decrees entered into with DEC, and various effluent limitations and compliance schedules which had been established in a draft SPDES permit issued to Kenmark Textile by the State of New York.

In 1980, Joseph Picone sold his property at the Site to SJ&J, of which he is president.

In May, 1983, Irwin Schoffman and Brent Associates, Inc. sold two parcels of Site property to 937-941 Conklin Street Associates. In 1985, these two parcels were sold by 937-941 Conklin Street Associates to Charles Selig who, in 1989 or 1990, resold this property to 937-941 Conklin Street Associates.

In January, 1984, Irwin Schoffman and Brent Associates, Inc. sold one lot of property at the Site to Brent Conklin, a co-partnership of Brent Associates, Inc., Irwin Schoffman, and Jacob and Ruth Kogel.

On December 11, 1986, Kenmark was connected to the Suffolk County Southwest Sewer District enabling it to discharge its wastewater directly into the sewer system.

In January, 1985, Kenmark sold its business to its employees, who changed the company's name to The Susquehanna Textile Company, Ltd. (Susquehanna Textile).

In May, 1986, DEC drafted consent orders for Susquehanna Textile and SJ&J which provided for, inter alia, investigation of the "existing, current and/or potential releases or migration" of hazardous wastes from the Site and the development of a remedial program designed to address this contamination. The Site was defined as the property upon which the Susquehanna Textile facility is located, and SJ&J entered into the Consent Order with the State. Pursuant to the Consent Order, SJ&J hired Fanning, Phillips and Molnar to prepare a RI/FS Sampling Plan and Sampling Report for the Site (Reference 2).

The Fanning, Phillips and Molnar RI Sampling Report (Reference 4) was completed for the Susquehanna Textile facility in June, 1990. The sampling results revealed concentrations of copper, zinc, chromium, silver, arsenic, lead and volatile organic compounds (VOCs) in the soils. VOCs, including chloromethane and tetrachloroethene, were detected in the groundwater at the Site, above Federal and State groundwater standards. However, chloromethane was also detected in the trip blank (see Figure 2.2.3 for sampling locations). According to the RI Sampling Report (Reference 4), groundwater samples collected from monitoring wells at the Site revealed lead and VOC contamination in excess of New York State and Federal groundwater standards.

Correspondences regarding the Site and some of the topics described in this section are included in Appendix A. Plate 2.1 is the map produced by the licensed surveying company (Tyson Surveyors).

2.3 CURRENT CONDITIONS

The basic processing operation for the present Site's tenants is shown in a flow diagram in Figure 2.3.1. A screen is first coated with a light sensitive emulsion. The design is then transferred photographically to the emulsion coated screen, after which the light softened emulsion is washed away, leaving the design behind represented as open screen (positive). The emulsion not subjected to the light then hardens and becomes opaque. The screen design is then tested on a fabric. If the design checks out, production begins with a different screen used for each color. The dyes used at the present time and in the past are water based dyes. Screen washout occurs after color application. The dye is then set into the fabric by a pressure and heat process or steam. Minor amounts of wastewater are produced from the steaming process as condensate. The fabric is then finally washed and the final product is then produced. Wastewater is produced by the final rinse out. Presently, all wastewater is disposed of into the Suffolk County sewer in accordance with Suffolk County Regulations for the South West Sewer District. The waste stream has been investigated and monitored frequently and no treatment has been required by SCDHS. This sewer disposal has been in effect since December 11, 1986.

The chemicals used in the process have included the Immarcol direct photo emulsion

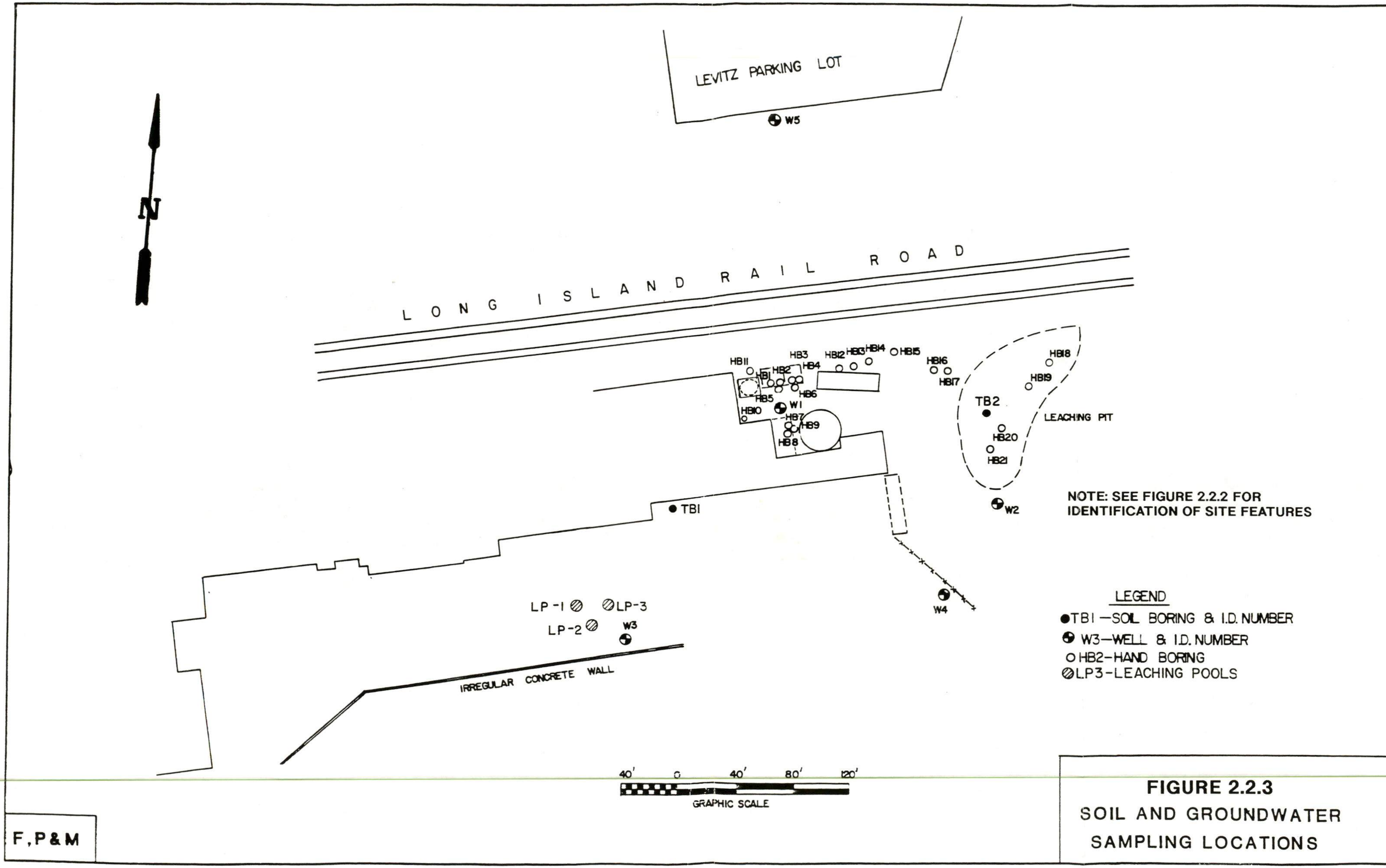

FIGURE 2.2.3
SOIL AND GROUNDWATER SAMPLING LOCATIONS

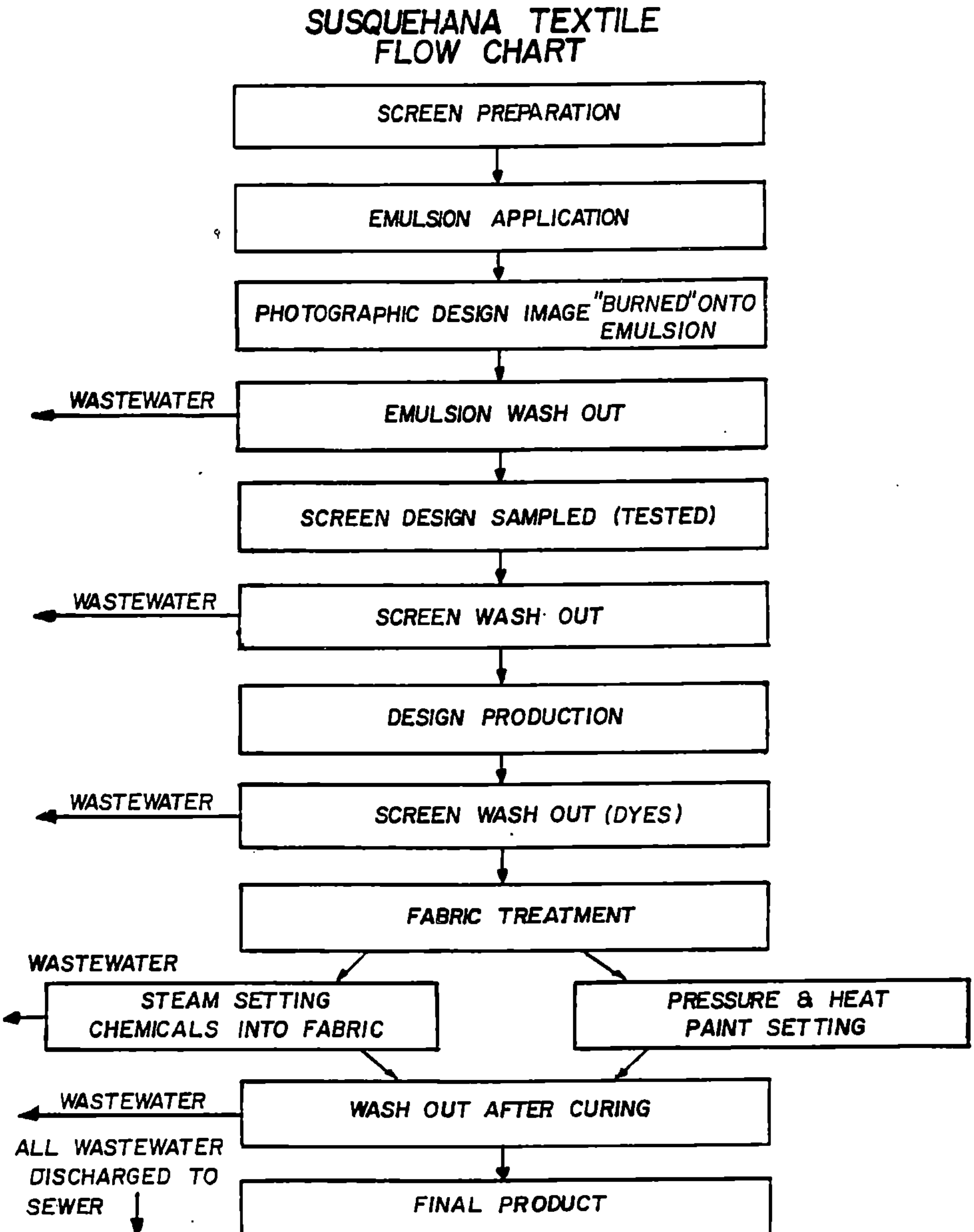

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FIGURE 2.3.1 – INDUSTRIAL PROCESS FLOW CHART

and the water soluble dyes used to color the fabrics. Occasionally solvents are used within the shop to remove adhesives from the tables that are used for wallpaper processes. The solvents are used on rags used to wipe down the process tables. These rags are collected by a linen supply and service company (Reference 19). All wastewater produced on Site is presently discharged to the sanitary sewer. Material Safety Data Sheets for the Immarcol Photo emulsion and the solvents are enclosed in Appendix B.

SECTION 3.0
INITIAL EVALUATION

Previous investigations of the Site have been performed by Fanning, Phillips and Molnar in compliance with a previous DEC Consent Order. Under the DEC Consent Order, Fanning, Phillips and Molnar prepared a RI/FS work plan which was approved. The RI/FS was subsequently executed with DEC oversight. Investigations performed for the Site have included: file studies, Site visits, regulatory agency information gathering, well installations, soil sampling, and laboratory analysis and interpretation. This information has provided the basis for this RI/FS work plan.

3.1 ENVIRONMENTAL SETTING

3.1.1 TOPOGRAPHY AND DRAINAGE

TOPOGRAPHY

The elevation of the Site is approximately 80 feet above mean sea level (AMSL) with the surface drainage predominantly in a south-southeast direction, as controlled by the Site topography. The grade at the Site is generally flat except for the base of the LIRR tracks, which has been raised in elevation (see Figure 2.1.1). The regional topographic gradient was obtained from the USGS 7½ minute topographic quadrangle map for Amityville. The topographic gradient in the vicinity of the Site slopes gently to the south-southeast at an average rate of approximately 15 feet per mile (0.28 percent).

DRAINAGE

The USGS reports that the soils of the Site area are highly permeable and runoff is estimated to be two percent of the total rainfall for storms of two to three inches in magnitude and five to six percent for storms of approximately ten inches (Reference 20). Therefore, runoff from the Site is likely to be very limited due to the gradual topographic gradient and the highly permeable soils (see Sub-section 3.1.2 for soils and surficial geology).

There are no natural surface water bodies (streams, rivers, lakes) within one-half mile downgradient of the Site to receive surface runoff. There is one artificial surface water body downgradient of the Site to receive surface runoff. There is one artificial surface water body located approximately 0.2 miles south of the Site (see Figure 2.1.1) that does not have an outlet. This area was originally a sand and gravel mining operation. After mining operations ceased, the basin was utilized by Fairchild Republic as a recharge basin for wastewater discharge until approximately 1985. The basin probably accepts runoff from the impervious surrounding area. The basin is the subject of a State Superfund investigation. It is unknown if the level of water in this basin reflects the groundwater table or if it is the result of clogging of the basin floor.

3.1.2 SOILS AND SURFICIAL GEOLOGY

SOILS

To assess the soil types at the Site, the soil survey for Suffolk County, New York was obtained from the Soil Conservation Service (Reference 21). The Site is determined to contain "Urban Lands" soil which are described as consisting of more than 80 percent buildings and pavements. No more specific description of the soils is presented in this source. However, in the vicinity of the Site, the predominant soil type is "Cut and Fill Lands, Gently Sloping". This indicates much of this light industrial area is constructed upon fill.

SURFICIAL GEOLOGY

The surficial geology of the Site, as shown in Figure 3.1.2.1, is outwash plain deposits of the Wisconsin glaciation (Reference 20). These deposits consist of stratified medium to coarse sand and gravel. The nearest change in surficial geology is approximately 2.0 miles to the north of the Site. It is an area mapped as the Manneto Gravel, which rises in elevation to approximately 125 feet AMSL. At the Site, the outwash deposits, present at the surface, extend to the top of the Magothy Formation (of Cretaceous age) at approximately 0 to -20 feet MSL. This unit is composed mostly of nonfossiliferous beds and lenses of gray and white fine quartz sand, clayey and silty sand, and clay.

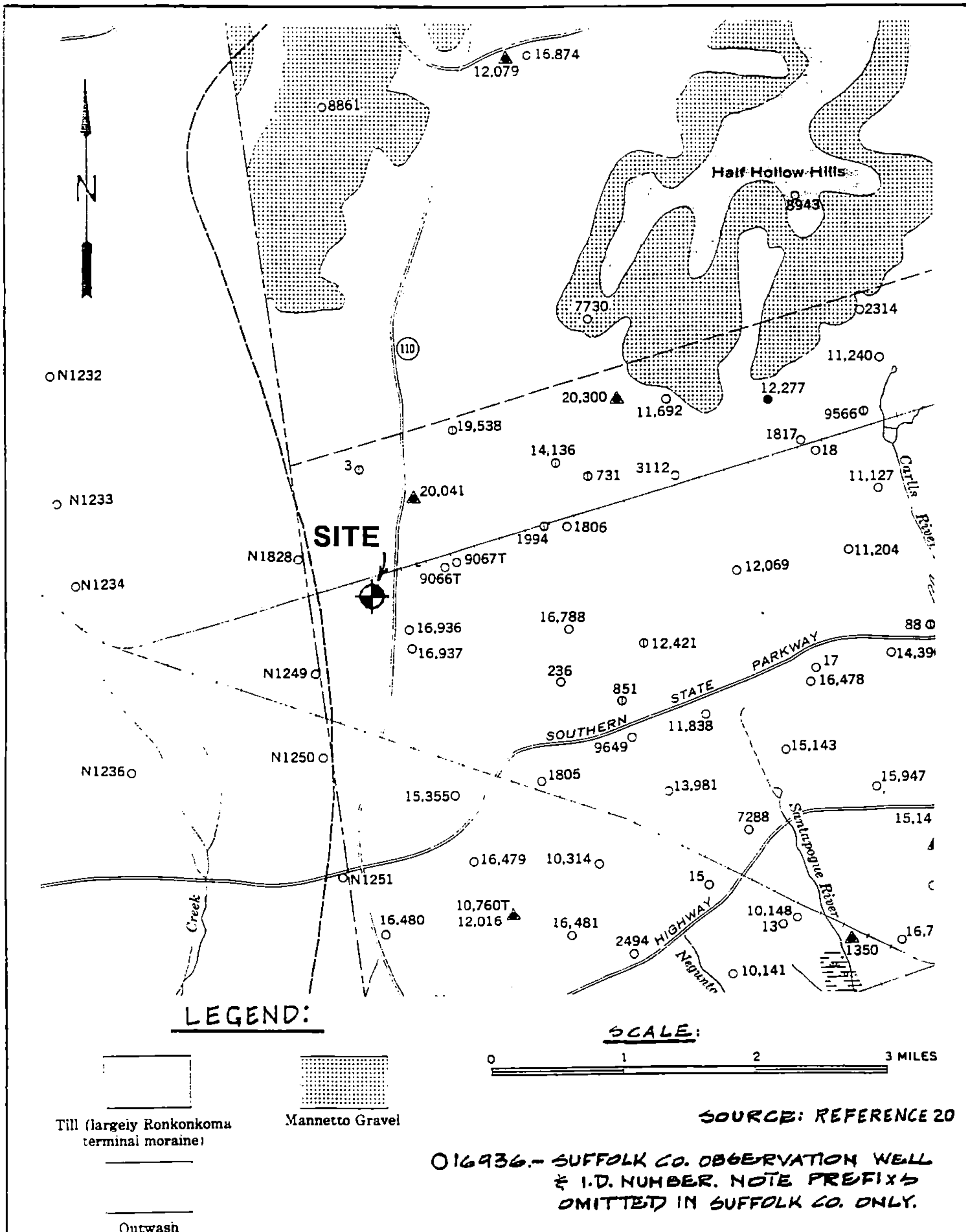

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FIGURE 3.1.2.1 – SURFICIAL GEOLOGY

3.1.3 GEOLOGY

REGIONAL GEOLOGY

The generalized geology of the Site area features a base of Precambrian crystalline bedrock predominantly composed of schist and gneiss overlain by the Lloyd Sand Member of the Raritan Formation (Cretaceous age). The unnamed clay member of the Raritan Formation overlies the Lloyd Sand Member, and thereby acts as a confining unit. It is informally referred to as the Raritan Clay. The Lloyd Sand Member is predominantly composed of light-colored sand and gravel and lenses of clay and silty clay. The unnamed clay member is composed of multicolored clay, silt and some very fine to fine sand (Reference 20).

Overlying the Raritan Formation is the Magothy Formation (Reference 20), also of Cretaceous age, which consists of nonfossiliferous beds and lenses of gray and white fine quartz sand, clayey and silty sand, and clay. At the Site area, upper Pleistocene deposits (glacial outwash) directly overlie the Magothy Formation. These deposits are composed of stratified medium-coarse sand and gravel (Reference 20). Table 3.1.3.1 is a summary of the geologic formations and stratigraphy within the regional Site area. Figure 3.1.3.1 is a geologic section of the formations from Fire Island (south) to Brentwood (north) which is approximately eight miles to the east of the specific Site area in this work plan. In this cross-section, the glacial deposits are approximately 120 feet thick. The glacial deposits at the Site are probably 80 to 100 feet thick based on the ground surface altitude and the surface altitude of the Magothy Formation depicted in Reference 20.

No geologic log was recorded for the completion report record of the abandoned on-site production well, DEC #S-1. The nearest well with an extensive log is well 28212 (28211-test well) at Fairchild Republic. Wells within the Site vicinity are shown in Figure 3.1.3.2. From the log of 28212, the Pleistocene (glacial outwash) deposits extend to a depth of 135 feet beneath grade, where the Magothy Formation begins and extends to 600 feet.

Two stratigraphic cross-sections were constructed from the drilling logs of wells (see

Era	Period	Epoch	Geologic unit		Remarks
Cenozoic	Quaternary	Recent	Recent deposits		Stream, beach, and marsh deposits; small areal extent.
		Pleistocene	Upper Pleistocene deposits		Till and outwash deposits of the Wisconsin Glaciation.
			Gardiners Clay		Fossiliferous marine clay of probable Sangamon age.
	Tertiary(?)	Pliocene(?)	Mannetto Gravel		Formerly believed to be an outwash deposit but now regarded as a stream-terrace deposit; small areal extent.
Mesozoic	Cretaceous	Late Cretaceous	Magothy(?) Formation		Interbedded sand, silt, and clay.
			Raritan Formation	Clay member	Dominantly clay but may contain some silty and sandy zones locally.
				Lloyd Sand Member	Sand, gravel, and interbedded clay and silt.
Precambrian and early Paleozoic(?)			Bedrock		Schist and gneiss containing some granitic intrusions.

SOURCE: REFERENCE 20

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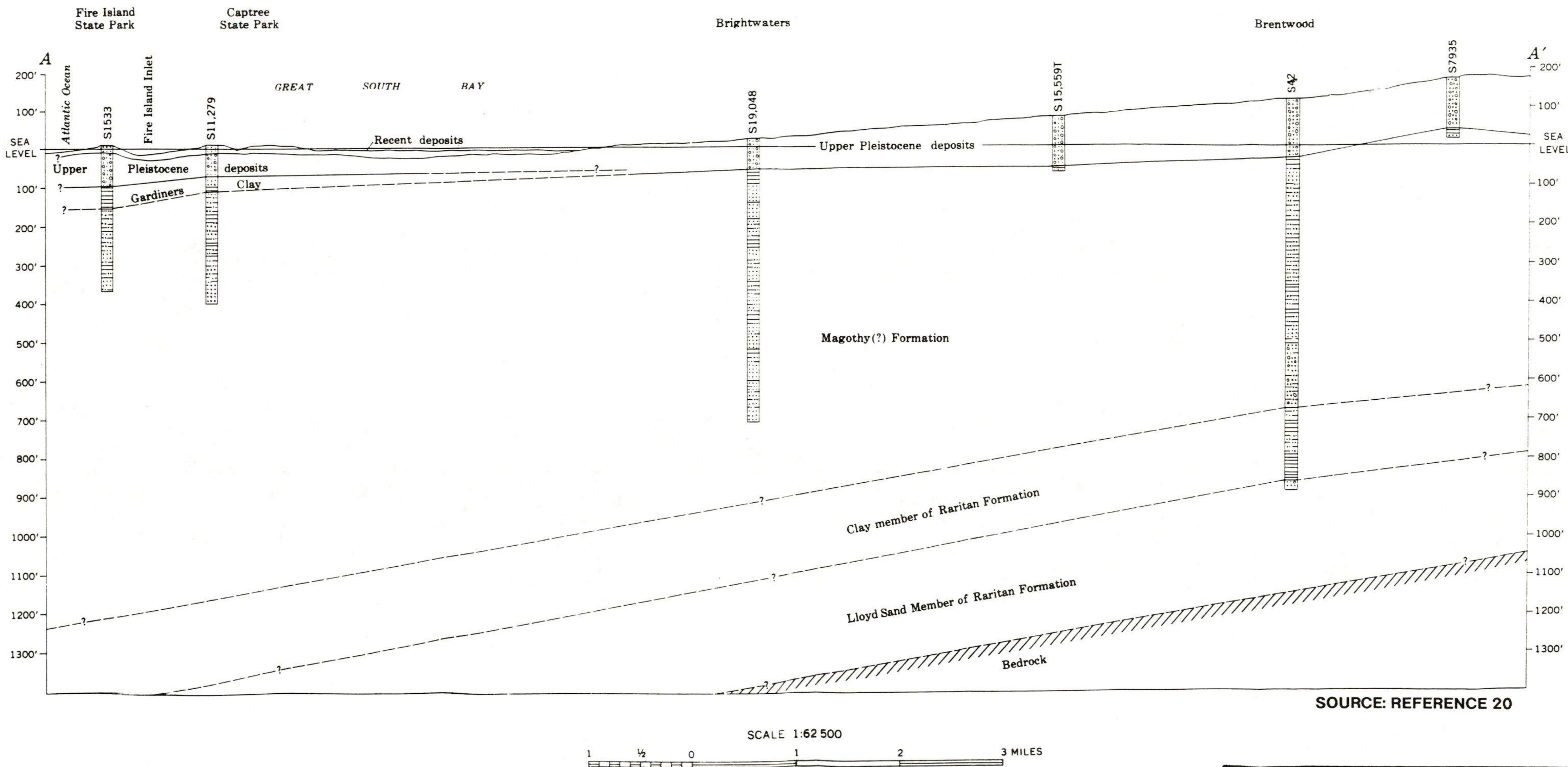
TABLE 3.1.3.1 – SUMMARY OF STRATIGRAPHY OF THE BABYLON – ISLIP AREA



SOURCE: REFERENCE 20

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FIGURE 3.1.3.1
GEOLOGIC CROSS-SECTION FROM FIRE ISLAND TO BRENTWOOD, N. Y.

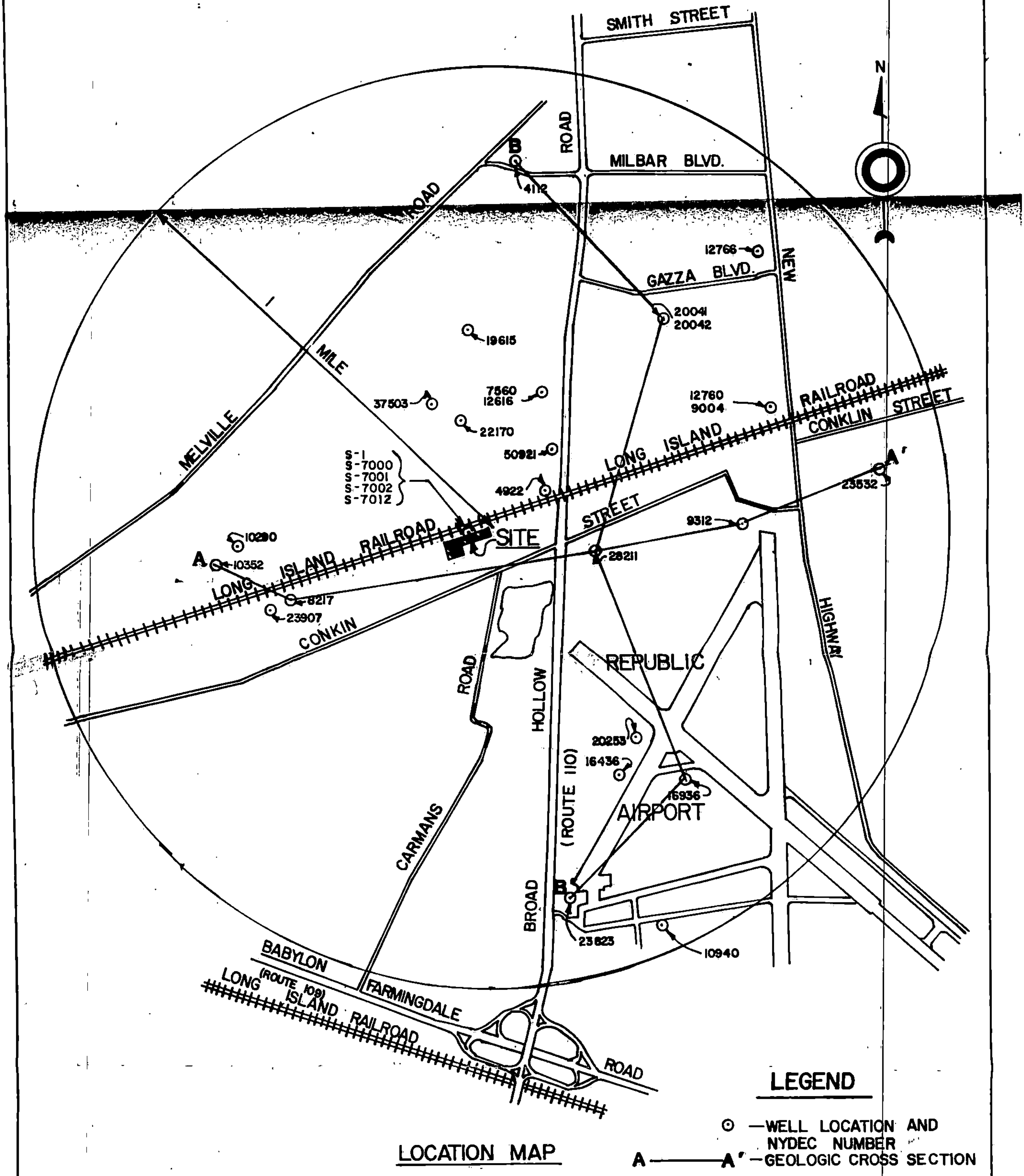


FIGURE 3.1.3.2—LOCATION OF WELLS WITHIN SITE VICINITY

Figures 3.1.3.3 and 3.1.3.4) in the Site vicinity. The location of cross-sections A-A' and B-B' are shown on Figure 3.1.3.2. These sections show the thickness of the Pleistocene deposits to be approximately 100 to 160 feet and also show the underlying Magothy Formation.

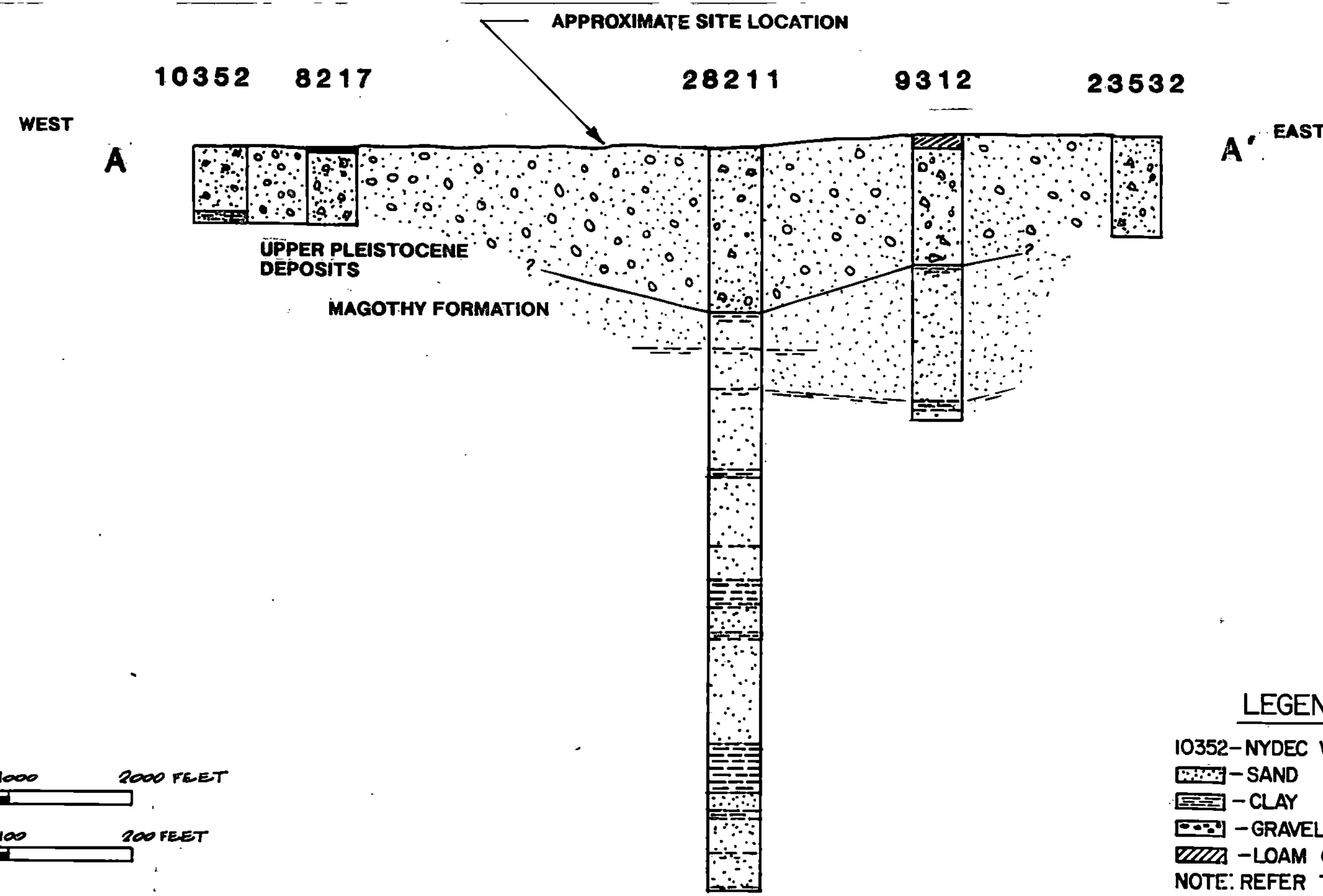
SITE GEOLOGY

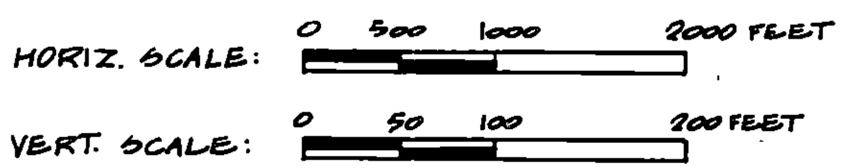
As presented in the Fanning, Phillips and Molnar RI/FS 1990 report (Reference 4), two (2) test borings and five (5) groundwater monitoring wells were drilled. Drilling logs of the test borings and wells were recorded and are shown in Appendix C. The Site specific geology is shown on Plate 3.1.3.1 which includes a Site plan and three (3) geologic cross-sections through the Site. In addition, soil samples were obtained from the unsaturated and saturated zones (within the borings) by use of a split-spoon sampler at test borings TB-1 and TB-2 and monitoring wells MW-1, MW-3, MW-4 and MW-5. The soil samples were obtained for chemical analysis and the remainder of the split-spoon samples were retained in order to perform more specific soil descriptions. These portions of the split-spoon soil samples were dried, weighed, and prepared for sieve analysis. Selected soil samples were sieved and plotted on grain-size distribution curve as presented in Appendix D. Based upon these analyses and field logs, soil descriptions and characteristics were interpreted. Based upon the previous RI report, soils at depths ranging from 0-37 feet are described as brown to light-brown, medium to coarse, well sorted sand, some gravel (rounded), and limited clay (mixed with silt) lenses. This soil profile is consistent with the past geomorphology-glacial outwash.

3.1.4 HYDROGEOLOGY

REGIONAL

There are two aquifers of potential concern within the Site area. The first aquifer from land surface is identified as the upper glacial (water table) aquifer which is estimated to have a saturated thickness of 60 to 80 feet. It is associated with the upper Pleistocene deposits. The second aquifer is the Magothy aquifer, which underlies the upper glacial aquifer. It is estimated to be over 500 feet thick and is associated with the Magothy Formation (Reference





LEGEND

10352–NYDEC WELL LOG #.
– SAND
– CLAY
– GRAVEL
– LOAM OR FILL
NOTE: REFER TO FIGURE 3.3 FOR CROSS-SECTION LOCATION

F, P & M

FIGURE 3.1.3.3 –
STRATIGRAPHIC SECTION A – A'

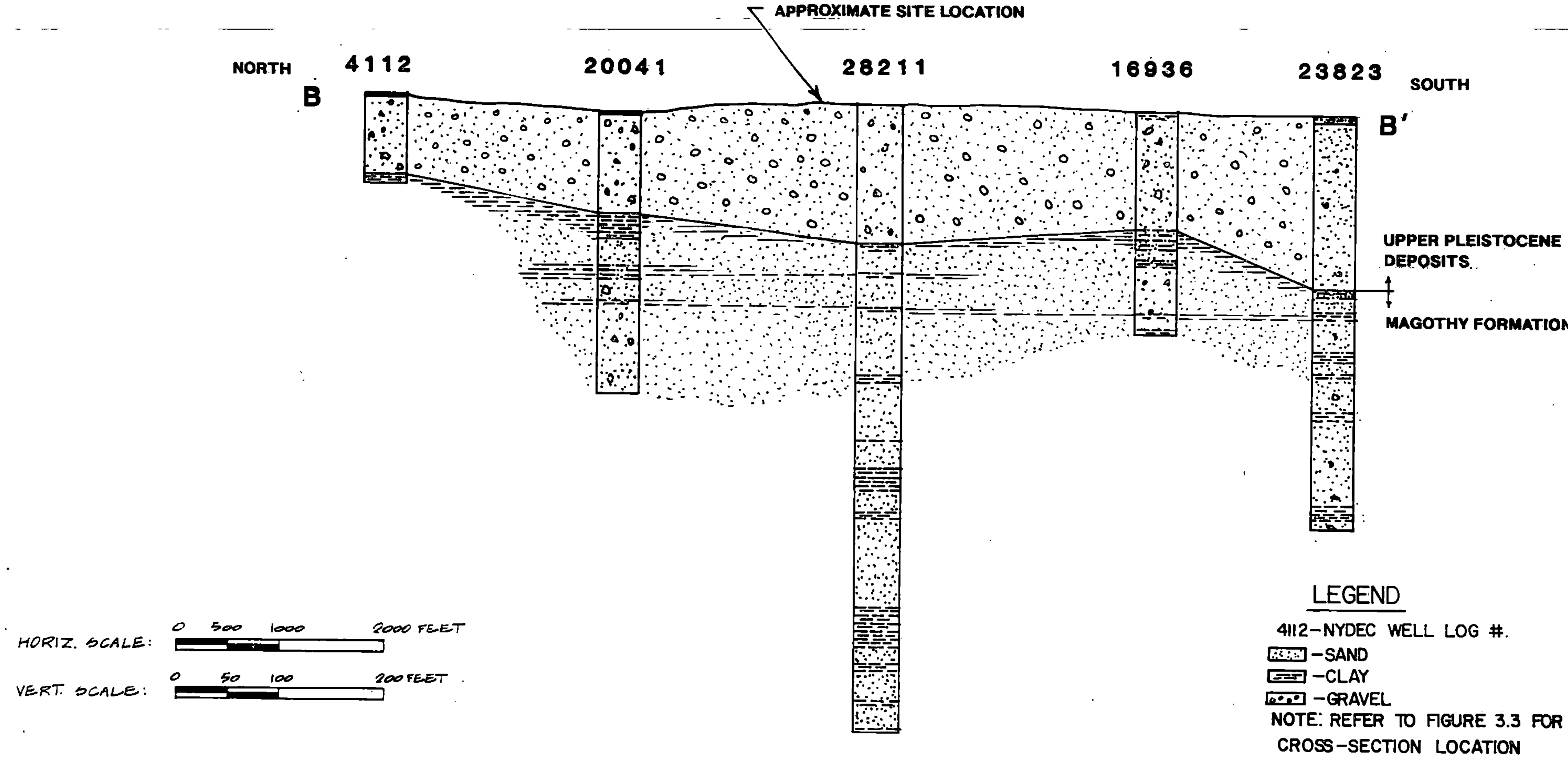


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FIGURE 3.1.3.4 – STRATIGRAPHIC SECTION B – B'

20). Beneath the Magothy, the Raritan Clay represents a confining layer and the lower limit of the Magothy aquifer. Neither the Gardeners Clay, the 20-foot Clay, nor any other confining unit is reported to exist beneath the Site from the ground surface down to the Raritan Clay (Reference 20 and 22).

The water table elevation and regional flow direction in the vicinity of the Site has been obtained from the SCDHS Groundwater Elevation Contour Maps (March, 1990) and is presented in Figure 3.1.4.1 (Reference 23). This figure shows that the groundwater elevation at the Site is approximately 60 feet AMSL.

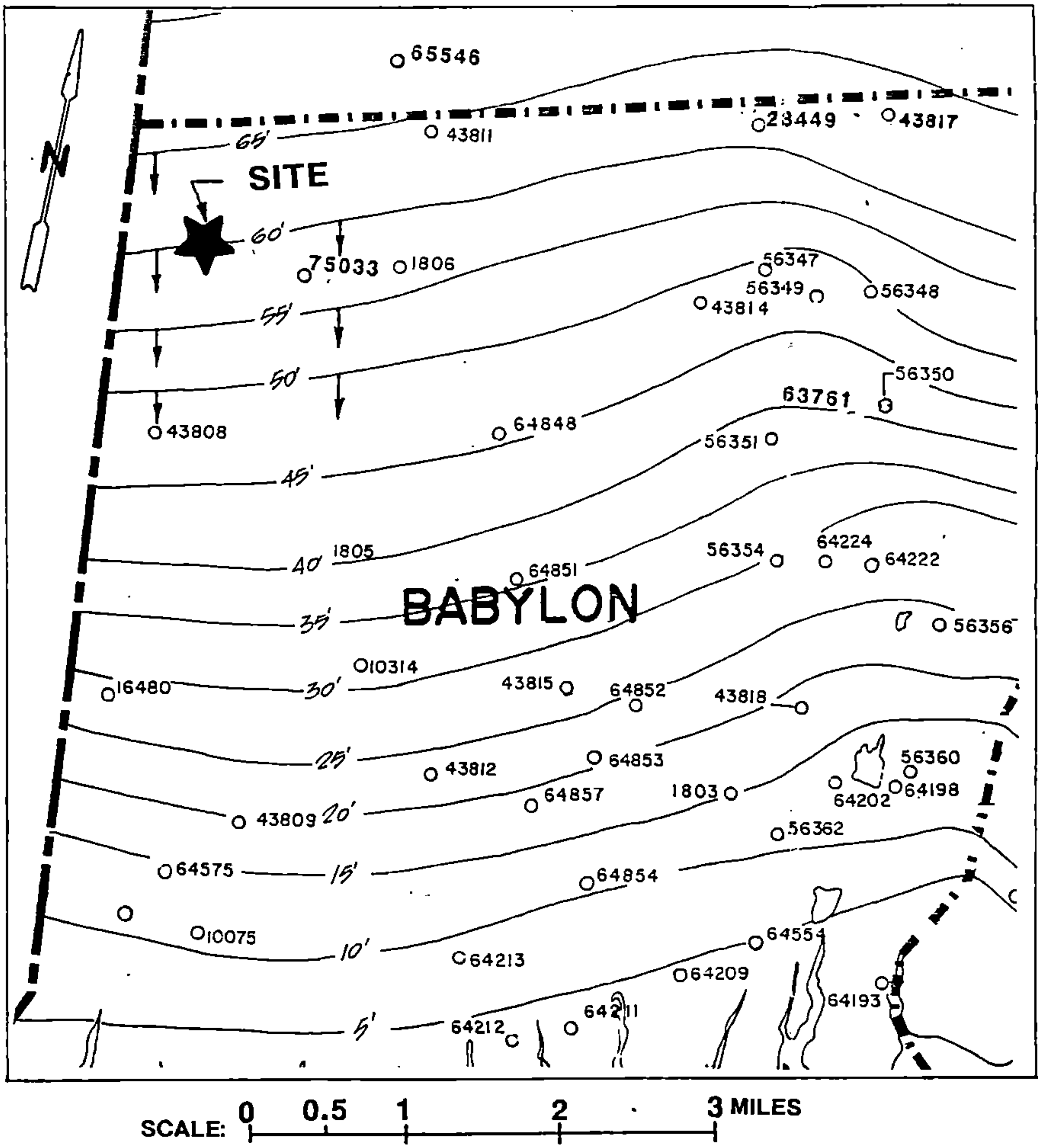
Based upon a surface elevation of approximately 80 feet and a groundwater elevation of approximately 55 feet (see Figure 3.1.4.1 and Reference 23, respectively), the depth to groundwater on the Site area is approximately 25 to 30 feet. The generalized horizontal groundwater flow direction in the Site area is south-southeast (see Figure 3.1.4.1).

An estimate of the average hydraulic conductivity and transmissivity for the Site area is given in the USGS Paper 627-E "Water Transmitting Properties of Aquifers on Long Island, New York" (Reference 24). The estimated average hydraulic conductivity given for the approximate Site area is 2,000 gallons per day per square foot (gal/d/f^2). The estimated transmissivity for the Site area is 150,000 gallons per day per foot (gal/d/f).

SITE HYDROGEOLOGY

The Site hydrogeology was obtained from data presented in the Fanning, Phillips and Molnar RI Report (Reference 4). Drilling logs for the five (5) wells installed on the Site during the Fanning, Phillips and Molnar RI were recorded and are presented in Appendix C. Table 3.1.4.1 presents a summary of well installation and development information for each of the five (5) wells. Table 3.1.4.1 lists the well ID#, the date it was installed, the depth of the well, the length of the screen, the slot size of the screen, the depth to water, the date of final development, and total gallons purged during development.

The Site cross-sectional geology is shown in Plate 3.1.3.1, which includes a Site plan



LEGEND:

— 60' — GROUNDWATER ELEVATION CONTOUR

⟶ GROUNDWATER FLOW DIRECTION

SOURCE: BASE MAP FROM THE SCDHS, MARCH, 1990, REFERENCE 23

FIGURE 3.1.4.1 – REGIONAL WATER TABLE CONTOUR MAP AND GROUNDWATER FLOW DIRECTION

F,P&M

TABLE 3.1.4.1[1]
SUMMARY OF WELL INSTALLATION AND DEVELOPMENT AT SJ&J SITE FARMINGDALE, NEW YORK

Well ID#	Date Installed	Depth of Well 11/91 Measurements	Screen Length	Screen Slot Size	Depth to Water 7/21/88 Measurements	Date of Final Development	Total Gallons Purged
MW-1	06/01/88	36.20	10'	0.010"	29.82	07/14/88	48
MW-2	06/11/88	33.81	10'	0.010"	27.00	07/13/88	35
MW-3	05-28-88	36.32	10'	0.010"	28.35	07/14/88	34
MW-4	06/01/88	30.40	10'	0.010"	26.90	07/14/88	41
MW-5*	06/24/88	24.25	10'	0.010"	16.45	07/14/88	95

(1) See Plate 3.1.3.1 for well locations.
* MW-5 was not installed on the site. This well was selected to represent upgradient groundwater conditions.

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that depicts the location of the three geologic cross-sections through the Site (constructed from drilling log information). In addition, soil samples were obtained from the saturated zone within the borings of MW-1, MW-3, MW-4 and MW-5 in order to determine the average hydraulic conductivity of the water table aquifer by using the Moretrench American Corporation Method (Reference 25, pg. 737 to 738). The results of the calculations showed the average hydraulic conductivity to be approximately 1,640 gal/d/f^2. Appendix D presents the calculations and data used to derive the hydraulic conductivities at each well. The method requires that the soil sample have a sieve analysis performed and graphed. A uniformity coefficient (U_c) is then calculated by dividing the 40 percent coarser by weight grain size value by the 90 percent coarser by weight grain size value. The 50 percent by weight grain size value (D_{50}) is determine from the grain size analysis data graph also. The density of the soil as determined from the Standard Penetration Test (ASTM D1586) is categorized by use of Table 2.2.1 from Reference 25 (included in Appendix D). The hydraulic conductivity of the soil is then determined from the graphs of Figure 2.2.1 of Reference 25 (see Appendix D) using the previously determined values for U_c, D_{50} and soil density.

Water level measurements were taken at each of the wells (measurements were taken in 1988). The elevation and location of each well point, and measuring point of each well, were surveyed by a New York State-licensed surveyor. From the survey and water level measurements, Figure 3.1.4.2 was constructed to show a groundwater contour map of the water table. (Plate 2.1 is the contracted licensed surveyor's map used to prepare Figure 3.1.4.2.). The contour map shows the groundwater flow direction beneath the Site to be south-southeast. This result is consistent with the regional flow (Reference 23).

The average groundwater flow gradient was calculated to be 0.00086 feet per foot. Through calculations of the average hydraulic conductivity and the average groundwater gradient, the pore velocity was calculated to be approximately 0.53 ft/day in a south-southeast direction.

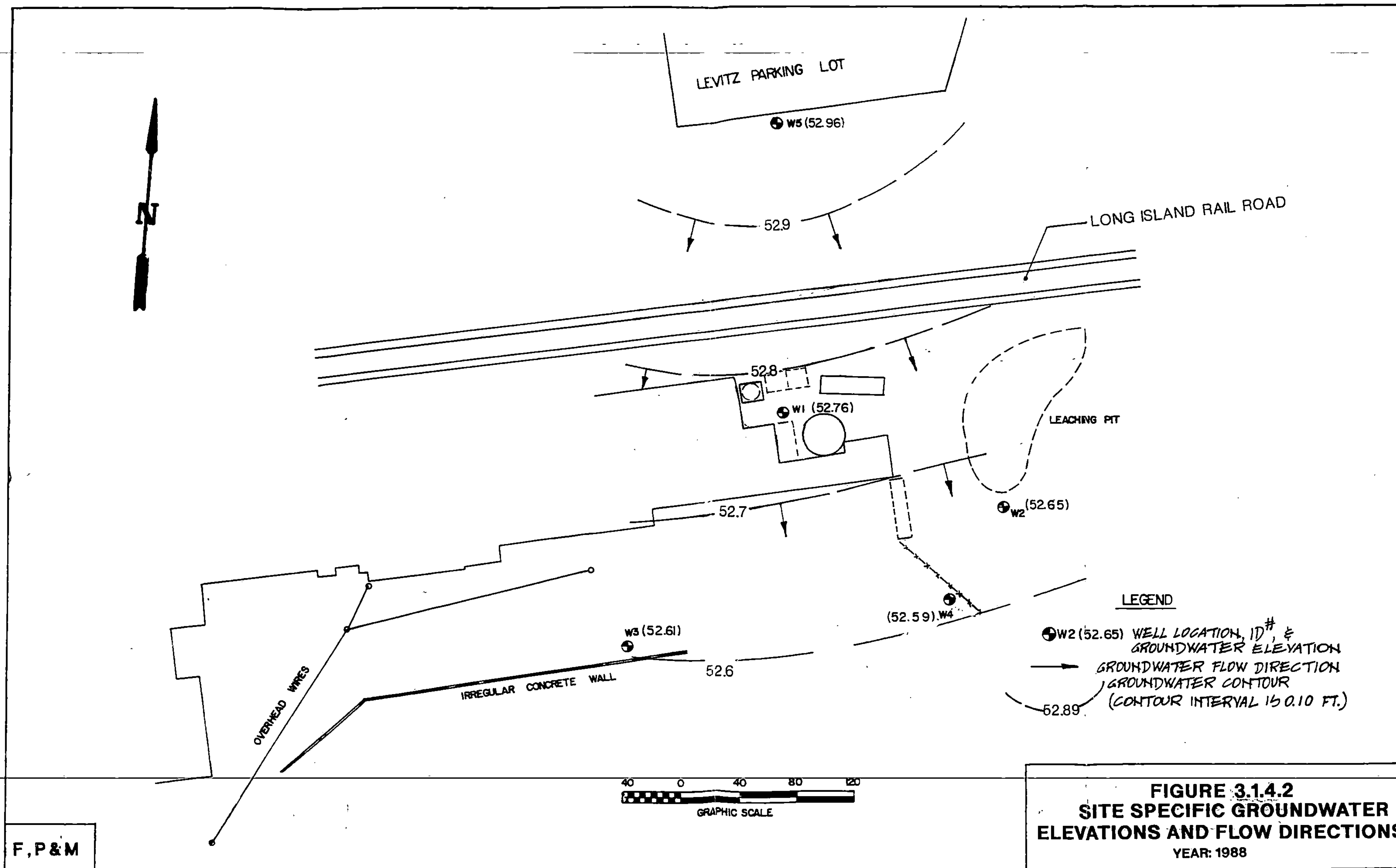

FIGURE 3.1.4.2
SITE SPECIFIC GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS
YEAR: 1988

3.1.5 SUPPLY WELL SURVEY

PUBLIC WATER SUPPLY WELLS

There are no public well supply fields within a 0.5-mile radius of the Site based on a review of DEC water well records unit information. This unit regulates and permits all public supply wells. Figure 3.1.5.1 depicts the public supply well districts and locations of public supply wells within a one-mile radius of the Site. There are three well fields within the 0.5 to 1.0-mile radial area at the Site. Two of these well fields - S-39709 and S-20041, 20042 - are owned and operated by the East Farmingdale Water District. These well fields are upgradient of the Site. All three wells are screened in the Magothy aquifer, which underlies the shallower upper glacial aquifer. The third well field is owned by the Village of Farmingdale. It consists of wells N-525, N-705, N-706 and N-7852 and is cross-gradient of the Site. Wells N-525, N-705 and N-706 are abandoned. Only N-7852 is still in use and is screened in the Magothy aquifer.

PRIVATE SUPPLY WELLS

The DEC water well records unit was contacted to determine the locations of private supply wells in the study area. This unit regulates the permit process for water supply wells in Kings, Queens, Nassau and Suffolk Counties in New York. The drilling companies constructing supply wells are required to submit permit applications on all proposed supply wells. Completion reports are also required from these drilling companies after completion of the supply wells and are kept on file at DEC. The majority of these wells are plotted on maps at the DEC. This was the source of information to initially determine the identification and number of the private supply wells within a 0.5-mile radius of the Site. The locations were refined by locating the wells on Figure 3.1.5.2 using the completion report information.

The entire area surrounding the Site (1.0 mile radius) is serviced by public water supply except for NYS parkland in the northwest corner of the radial area and undeveloped area adjacent to the parkland as indicated in Figure 3.1.5.1. Table 3.1.5.1 indicates the use of each of the sixteen private supply wells known to exist within a 0.5-mile radius of the Site.

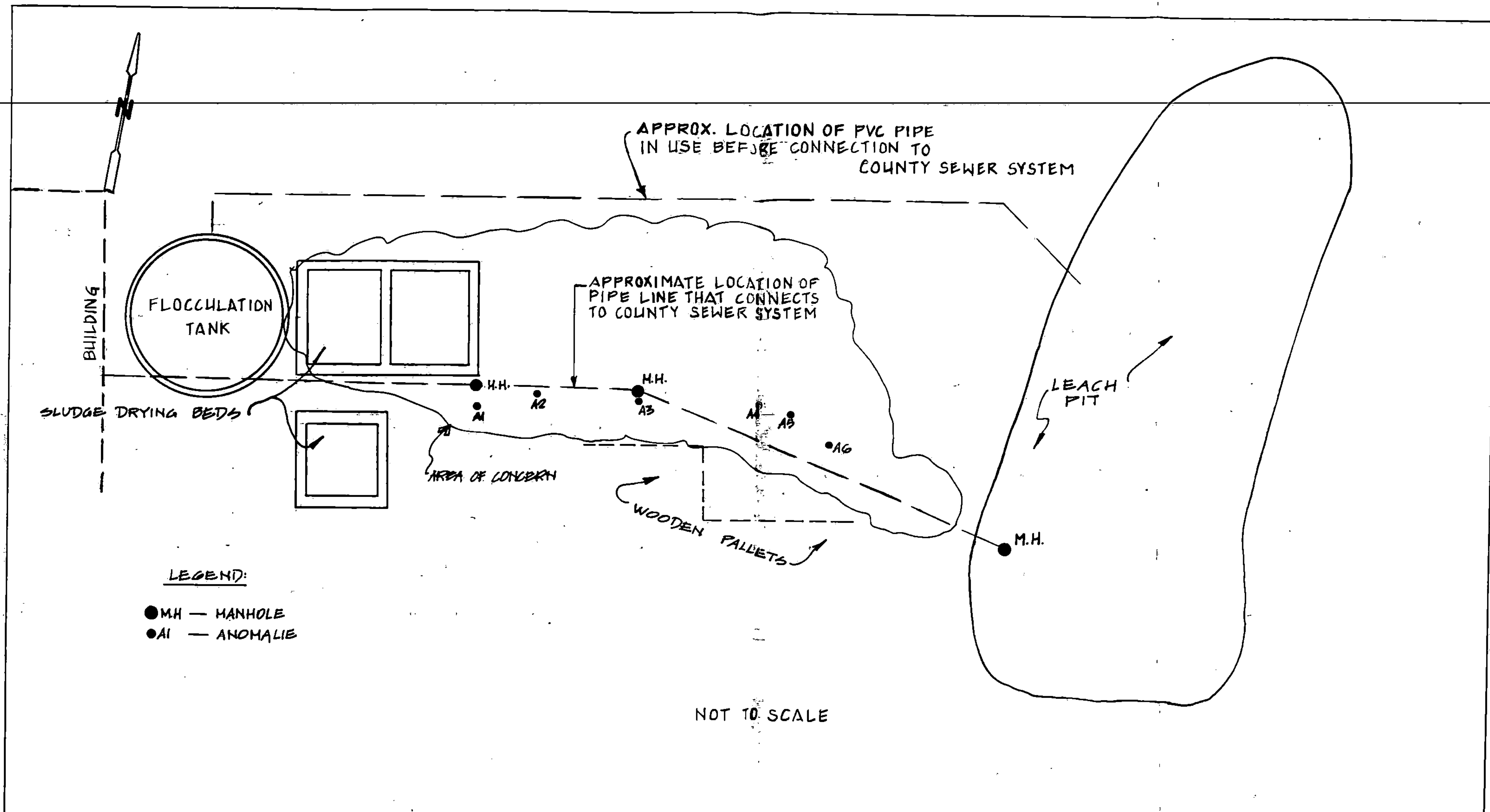

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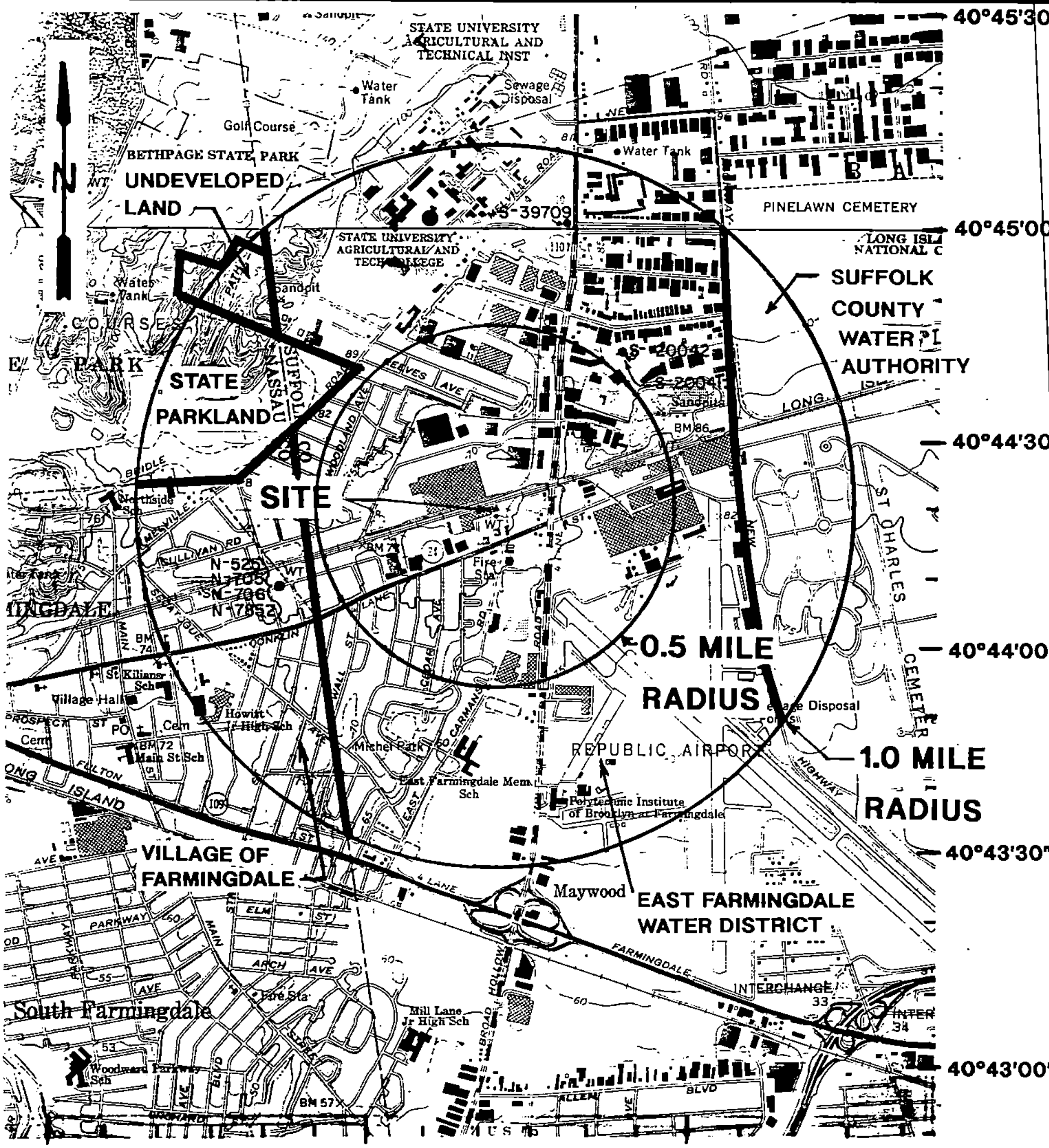
FIGURE 3.2.2.1
GEOPHYSICAL SURVEY MAGNETOMETER RESULTS



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MINUTE TOPOGRAPHIC MAPS (HUNTINGTON, 1979 AND AMITYVILLE, 1979 QUADRANGLES)

SCALE 1:24 000

½ 0 1 MILE

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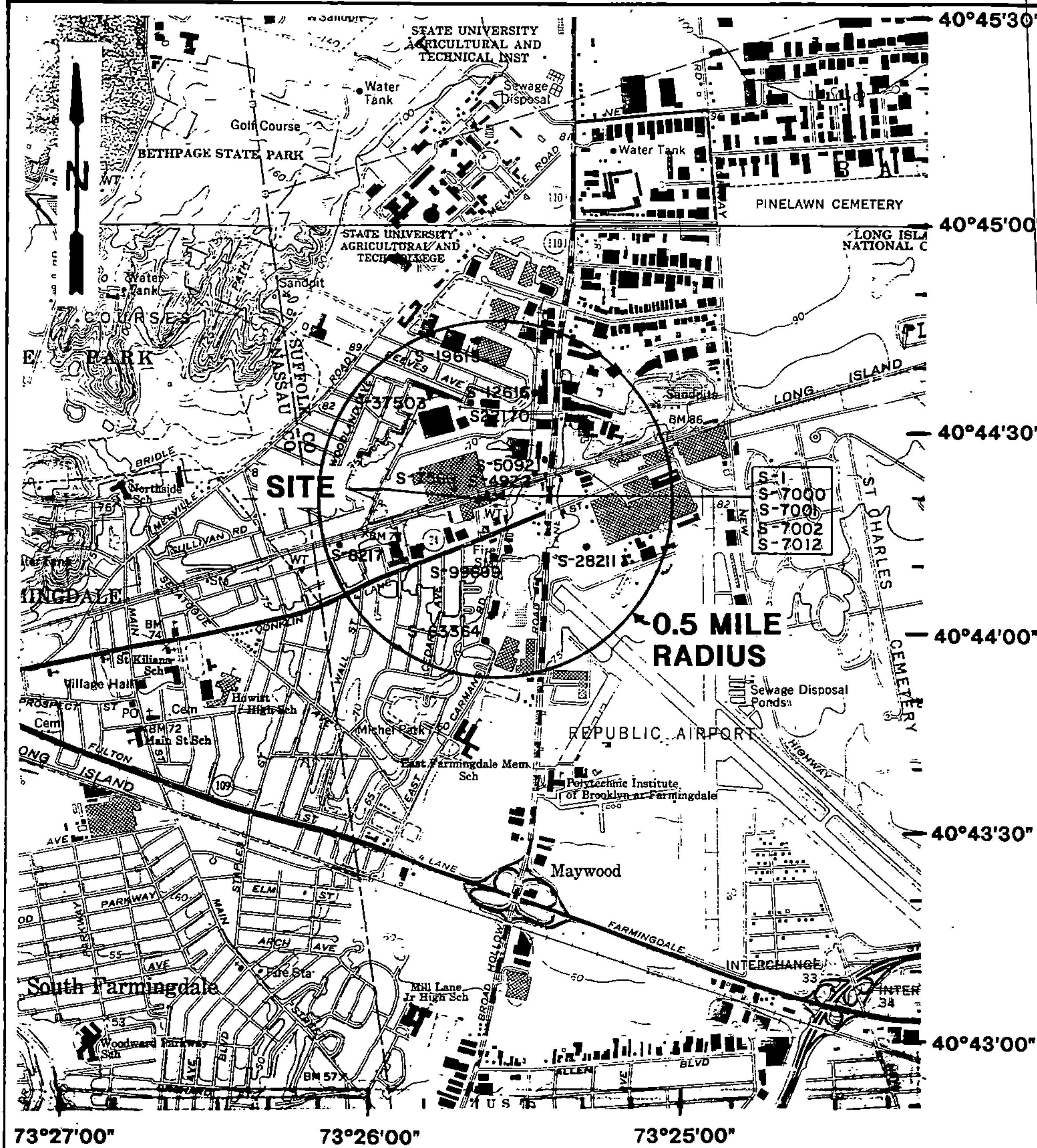
FIGURE 3.1.5.1 – LOCATIONS OF PUBLIC SUPPLY WELLS



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MINUTE TOPOGRAPHIC MAPS (HUNTINGTON, 1979 AND AMITYVILLE, 1979 QUADRANGLES)

SCALE 1:24 000

½ 0 1 MILE

FP&M

FIGURE 3.1.5.2 – LOCATIONS OF PRIVATE SUPPLY WELLS

TABLE 3.1.5.1
PRIVATE SUPPLY WELL INFORMATION

NYSDEC Well Number	Original Owner	Construction Date	Depth (Feet)	Aquifer	Use
S-37503	Target Rock Corporation	5/71	23	Upper Glacial	Plant process cooling
S-22170	Price Industrial Park	12/63	46.5	Upper Glacial	Gravel washing
S-19615	S. Kleins Dept. Stores, Inc.	4/61	78.5	Upper Glacial	Cooling
S-7560	East Coast Lumber Terminal Co.	6/49	74.5	Upper Glacial	Industrial
S-12616	East Coast Lumber Terminal Corp.	9/54	53.5	Upper Glacial	Cooling
S-50921	Marin Ford	1/74	47	Upper Glacial	Car washing - commercial
S-4922	East Coast Lumber Company	8/46	46	Upper Glacial	Industrial
S-28211	Fairchild Hiller Corp. - Republic Aviation Div.	11/66	576.5	Magothy	Industrial and sanitary
S-99699	East Farmingdale Fire Dept.	1/91	47	Upper Glacial	Non-potable, groundwater remediation
S-63364	Long Island Lighting Company	10/78	41	Upper Glacial	Temporary dewatering well, casing and screen were removed
S-8217	B.H. Aircraft	4/50	60.5	Upper Glacial	Cooling
S-1	Independent Silk Dyeing Co.	1930	525	Magothy	Industrial - no reported pumpage
S-7000	Independent Silk Dyeing Co.	1915	45	Upper Glacial	Industrial - **ABANDONED**
S-7001	Independent Silk Dyeing Co.	1917	45	Upper Glacial	Industrial - no reported pumpage
S-7002	Independent Silk Dyeing Co.	1921	45	Upper Glacial	Industrial - no reported pumpage
S-7012	Independent Silk Dyeing Co.	10/48	80.5	Upper Glacial	Industrial - **LAST REPORTED PUMPAGE WAS 1985 - 3 MILLION GALLONS FOR 1985.**

This table also indicates that none of the wells are used for domestic supply purposes. Appendix C, Section 2, contains the completion reports for these wells.

3.1.6 POPULATION AND ENVIRONMENTAL RESOURCES

Section 2.1 of this work plan indicates that approximately 10,000 resident live within a one-mile radius of the Site. This population is generally centered in the residential areas south and west of the Site, and a small residential area northwest of the Site (see Figure 2.1.1). The remaining area surrounding the Site has non-permanent work force population present, primarily during the daytime period. These areas are the Fairchild Republic and Pinelawn and Saint Charles Cemeteries southeast and east of the Site and the industrial area north of the Site.

Environmental resources within a 1.0-mile radial area of the site include groundwater and the Bethpage State Park. No wetlands are reported to exist within one mile of the Site. There are no National Forests or National Recreation areas. There are no natural surface water bodies within this area, such as streams, lakes or ponds. One artificial recharge basin is present with water present in its bottom. This basin was used for industrial wastewater recharge by Fairchild Republic (separate DEC superfund investigation). The water present in this basin is either the result of clogging of the basin floor or the top of the water table.

3.1.7 CLIMATOLOGY

The USGS water supply paper 1768 "Hydrology of the Babylon-Islip Area, Suffolk County, Long Island, New York" (Reference 20), lists the approximate annual precipitation rate, within the Site area as 46 inches per year. Water losses, due to evapotranspiration and direct run-off, are listed as a total loss of 22 inches, yielding a recharge rate to the groundwater reservoir as 24 inches per year. This recharge rate predominantly occurs during late fall, and early spring.

3.2 CHARACTERISTICS OF CHEMICAL CONTAMINATION

3.2.1 SOURCES AND DISTRIBUTION OF CONTAMINATION

The Kenmark Site, now occupied by Susquehanna Textile Corporation, located at Conklin Avenue, in Farmingdale, New York has been placed on the Federal EPA and New York State Inactive Hazardous Waste Disposal Site lists because of repeated alleged violations of the State Pollution Discharge Elimination System (SPDES) law. Alleged violations were reported for the discharge of partially treated waste to a leaching pit on Site. The Site has been designated as a Class 2 Site under the New York State Inactive Hazardous Waste Site law. This designation means that the Site poses a significant potential threat to the environment and requires the development of an inactive hazardous waste disposal Site remedial investigation.

The objective of the March, 1988, RI sampling plan was to determine the nature of the waste and the aerial and vertical distribution on the Site in a phased approach. Through the execution of the sampling plan, much was learned of the past and present operations of the Site as well as the environmental setting. Figure 2.1.1 shows the Site location on the USGS Amityville, seven and a half (7½) minute topographic quadrangle. Figure 2.2.2 shows the Site property and layout.

The manufacturing process that occurred at Kenmark is similar to what is occurring at the present time under Susquehanna Textile Corporation: textile printing. This process imparts a colored design on to a fabric by processing dye through a silk screen. In this process, printing pastes or dyes, which were stored and mixed on Site, are transferred to the fabric. The fabric is then steamed, aged, or otherwise treated to fix the color to the fabric. The emulsion is washed from the silk screens after they have been used. Presently, this wastewater is discharged to the Southwest Sewer District. However, in the past, Kenmark allegedly discharged this wastewater directly to an unlined lagoon (identified as leach pit on Figure 2.2.2) with only partial treatment.

Based upon past sampling and analyses completed by the SCDHS, Lakeland

Engineering and the DEC, the sampling of supernatant discharge into the leaching pit has shown one or more violations of GA groundwater standards for COD, pH, MBAS, dissolved solids, suspended solids, chloride, phenols, copper, iron, chromium (hexavalent), silver and lead. Tests were also performed on the hydroxide sludge for extraction procedure (EP) toxicity (Tox) and was determined not to be toxic or hazardous waste as per the RCRA EP Tox definition. Soil samples obtained by the DEC from the pump house basin, sludge drying beds and from the leaching pit, reported the presence of the following metals: cadmium, chromium, copper, zinc, arsenic, lead, mercury, nickel and silver. However, no volatiles, base neutrals, or acid extractables were detected. It was discovered that there were drums of solvents stored on a concrete pad outside the boiler room on the south side of the building. There were also drums of hydroxide sludge stored south of the solvent drum storage area on the cement parking lot.

Based upon the Site's past industrial processes and past analysis (and parameters identified within the wastewater discharge), a RI work plan was proposed and accepted by the DEC in May, 1988.

The RI sampling effort focused on characterizing the soils and groundwater that may have been affected by the past wastewater treatment and discharge areas, and the former drum area. In addition, the sampling effort also focused on creating a more detailed hydrogeologic setting for the Site.

In accordance with the sampling methodology and procedures outlined in the RI work plan (1988), data was obtained from the following locations at the Site: test boring in former solvent drum storage area (investigation for volatile soil contamination), along pipeline as determined by field observation (investigation for metals soil contamination), test boring in leaching pit (investigation for metals and VOCs soil contamination), background samples (investigation for metals soil contamination), outside sludge drying beds (investigation for priority pollutant (PP) contamination), alleged steam cooker discharge area (investigation for metals soil contamination), beneath sludge drying beds (investigation for PP soil contamination), well borings from groundwater monitoring wells (investigation for VOC soil contamination), leaching pools in the vicinity of the former sludge drum storage area (investigation for VOC and metal soil contamination), and groundwater monitoring wells (investigation for PP groundwater contamination). Select samples were tested for full PP to obtain a complete profile of chemicals although no PCBs, pesticides, herbicides, base neutrals, or acid extractables were ever detected at the Site.

3.2.2 CHEMICAL CHARACTERISTICS OF SOILS

This section of the work plan will present an overview of the preceding RI results (1990).

INVESTIGATION OF UNDERGROUND PIPELINES

A magnetometer survey was conducted (using a Schonstedt Heliflux Magnetic Locator Model GA-52B) on Site for the purpose of locating a possible underground steel pipe (which may have been used in the past to carry wastewater to the leaching pit). The magnetometer survey was performed by passing the instrument over the ground surface in a grid pattern as shown in Figure 3.2.2.1 of this study. The survey area was located between the former sludge drying beds and the leaching pit.

The results of the magnetometer survey indicated anomalous readings occurring at a number of locations within the survey grid. However, field observations indicated that the survey may have yielded inaccurate results, as a PVC pipe was identified from the leaching pit trending to the building. The PVC pipe was identified to trend east-west, just north of the magnetometer survey area. The anomalous readings from the Magnetometer Survey may be explained by the steel man-hole covers (sewer) in this location.

Boring locations for soil sampling along the pipeline were then revised due to field observations. The results of the samples taken along the PVC pipeline will be discussed later in this sub-section.

SUMMARY OF SOIL SAMPLING AND ANALYSES

A total of 57 soil samples were obtained on Site and two (2) soil samples were obtained off Site (Figure 3.2.2.2 shows the sampling locations on Site). A summary of the soil sampling for SJ&J is shown in Table 3.2.2.1. Table 3.2.2.1 lists the sample ID# and sample locations, the date of sampling, the sample depth interval, the date the sample was submitted to the laboratory, a physical description of the sample, and the parameters that were tested. Split samples, trip blanks and field blanks are also listed in Table 3.2.2.1 according to the dates they were submitted.

HEADSPACE SCREENING OF SOIL SAMPLES

A Foxboro organic vapor analyzer (OVA) was used to detect total organic vapors present in the head space of split soil samples listed in Table 3.2.2.1. This was done in order to screen the split soil sample (soil samples were split for both OVA analysis and laboratory analysis pending OVA results). Those samples showing high readings (>5 ppm) were analyzed for Priority Pollutants (PP) VOCs (as per the approved work plan) at the laboratory. The headspace analysis followed the procedures outlined in the RI work plan (Reference 2) and included heating each sample, in a temperature controlled oven, for 30 minutes. The OVA results of the screening are presented in Appendix E. In addition, a field gas chromatograph (GC) was used to determine the existence of multiple VOCs in samples detected with high total organic vapors. The GC strip charts for all standards that were analyzed in the field such as methane & tetrachloroethylene (PCE) are included in Appendix E.

The results of the OVA headspace analysis for soil samples necessitated 24 soil samples to be tested further for VOCs by the laboratory (see Table 3.2.2.2 for summary of OVA screening of soil sample headspace).

Select soil samples were split with the DEC. One soil sample was also split by Fanning, Phillips and Molnar for analysis at two (2) EPA Contract Laboratory Program (CLP) laboratories (H2M and NYTEST).

In summary, 57 soil samples were tested for total metal analysis (As, Cd, Cr, Cr^{+6}, Cu,

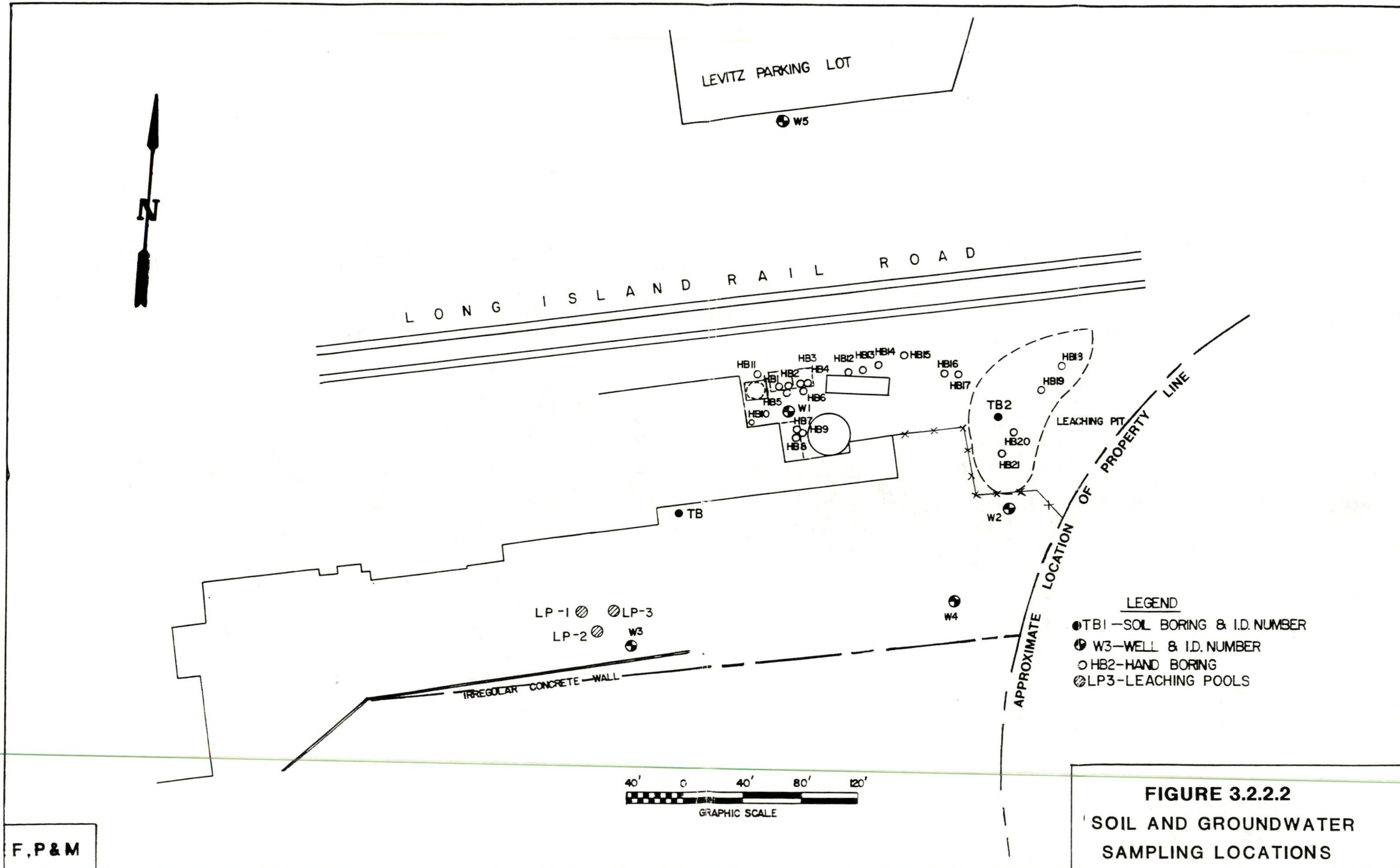


FIGURE 3.2.2.2
SOIL AND GROUNDWATER SAMPLING LOCATIONS

TABLE 3.2.2.1*
SUMMARY OF SOIL SAMPLING AT SJ&J SITE
FARMINGDALE, NY

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TEST BORING IN FORMER SOLVENT DRUM STORAGE AREA					
TB-1	05/26/88	4'-6'	05/26/88	Gravelly sand with some clay.	VOCs(1)
TB-1	05/26/88	8'-10'	05/26/88	Sand-gravel with some fine sand.	VOCs
TB-1	05/26/88	18'-20'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
TB-1	05/26/88	22'-24'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
ALONG PIPELINE					
HB-11	06/03/88	0"-6"	06/06/88	Gray silty sludge and brown silt.	Metals(2)
HB-12	06/03/88	6"-12"	06/06/88	Brown sand with silt and gravel.	Metals
HB-13	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-14	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-15	06/03/88	0"-6"	06/06/88	Brown silty sand with some gravel.	Metals
HB-16	06/03/88	6"-12"	06/06/88	Brown silt with some fine sand and clay.	Metals
HB-17	06/03/88	6"-12"	06/06/88	Brown silty clay.	Metals
TEST BORING IN LEACH PIT					
TB-2	07/12/88	10'-12'	07/13/88	Brown-orange fill with discolored gray sand.	Metals
TB-2	07/12/88	12'-14'	07/13/88	Medium-course sand slightly discolored.	Metals
TB-2	07/12/88	14'-16'	07/13/88	Medium-course sand with gravel. Streaks of blackish substance.	Metals
TB-2	07/12/88	16'-18'	07/13/88	Medium-course sand with some gravel. Streaks of blackish substance.	Full PP scan
TB-2	07/12/88	18'-20'	07/13/88	Medium-course sand with some gravel. Some moist silt.	Metals
TB-2	07/12/88	20'-22'	07/13/88	Medium-course black and brown sand with some gravel.	Metals
TB-2	07/12/88	22'-24'	07/13/88	Brown (slightly gray) medium-course sand with some blackish color.	Metals(3)

* All samples composited from indicated depths, except VOCs.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 3.2.2.2 for summary of OVA screening of soil samples and Appendix F for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 3.2.2.1* (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TB-2	07/12/88	24'-26'	07/13/88	Medium-course sand (brown) with gravel. Some discoloration.	VOCs(1) Metals(2)
TB-2	07/12/88	26'-28'	07/13/88	Black stained medium-course sand with some gravel.	Metals
HAND BORING IN LEACHING PIT					
HB-18	06/03/88	0"-6"	06/06/88	Stained dark gray medium-course sand and gravel.	Metals
HB-18	06/03/88	2.5'-3'	06/06/88	Gray-stained medium-course sand and gravel.	VOCs Metals
HB-18	06/03/88	4'-4.5'	06/06/88	Medium-course sand with gravel. Slight gray staining.	VOCs Metals
HB-19	06/03/88	0"-6"	06/06/88	Medium-course sand with some gravel.	Metals
HB-19	06/03/88	2.5'-3'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-19	06/03/88	4.5'-5'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-20	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with gravel.	VOCs Metals
HB-20	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel.	Metals
HB-20	06/06/88	5'-5.5'	06/06/88	Tan, medium-course sand with gravel, pebbles.	VOCs Metals
HB-21	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with silt and gravel.	Metals
HB-21	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel	VOCs Metals
HB-21	06/06/88	5'-5.5'	06/06/88	Medium-course sand with gravel.	Metals
BACKGROUND SAMPLES					
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOC Metals
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOCs Metals

* All samples composited from indicated depths, except VOCs.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 3.2.2.2 for summary of OVA screening of soil samples and Appendix F for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 3.2.2.1* (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
OUTSIDE SLUDGE DRYING BEDS					
HB-5	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals(2)
HB-5	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-9	06/02/88	3'-3.5'	06/02/88	Medium course sand with some gravel.	Metals
STEAM COOKER AREA					
HB-10	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-10	06/02/88	At 18"(4)	06/02/88	Medium course sand with some gravel.	Metals
SLUDGE DRYING BEDS					
HB-1	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs(1) Metals
HB-1	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals Full Priority Pollutant Scan
HB-4	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-4	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals
HB-8	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-8	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals

* All samples composited from indicated depths, except VOCs.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 3.2.2.2 for summary of OVA screening of soil samples and Appendix F for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 3.2.2.1* (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
WELL BORINGS					
MW-1	05/31/88	20'-22'	05/31/88	Medium-course sand with fine gravel.	VOCs(1)
MW-3	05/27/88	25'-27'	05/31/88	Medium-course sand lens of fine gravel	VOCs
MW-4	05/31/88	15'-17'	05/31/88	Medium-course sand	VOCs
LEACHING POOLS					
LP-1	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark, fine silt with slight odor.	VOCs Metals(2)
LP-2	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Black, moist clay with some gravel	VOCs Metals
LP-3	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark clay with sand. Slight odor.	VOCs Metals
FIELD AND TRIP BLANKS					
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/26/88	Aqueous	VOCs
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/31/88, 06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	05/31/88, 06/31/88	Aqueous	VOCs
TRIP BLANK	05/31/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/01/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs Metals
FIELD BLANK	06/01/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full PP scan
FIELD BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full PP scan

* All samples composited from indicated depths, except VOCs.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 3.2.2.2 for summary of OVA screening of soil samples and Appendix F for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

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TABLE 3.2.2.2
SUMMARY OF OVA HEADSPACE SCREENING OF SOIL SAMPLES*
THAT REQUIRED VOLATILE ORGANIC COMPOUND ANALYSIS
SJ&J SITE
FARMINGDALE, NY

Sample ID (Depth interval)	Field Oven Temperature	Time of Heating	Reading (ppm[1])
TB-1 (4'-6')	130°F	1/2 hour	2
TB-1 (8'-10')	130°F	1/2 hour	4
TB-1 (18'-20')	130°F	1/2 hour	12
TB-1 (22'-24')	130°F	1/2 hour	5
TB-2 (16'-18')	130°F	1/2 hour	34
TB-2 (24'-26')	130°F	1/2 hour	38
Well #1 (20'-22')	150°F	1/2 hour	22
Well #3 (25'-27')	140°F	1/2 hour	2
Well #4 (15'-17')	150°F	1/2 hour	12
Leach Pool #1	130°F	1/2 hour	400
Leach Pool #2	130°F	1/2 hour	>1,000
Leach Pool #3	130°F	1/2 hour	52
HB-1 (0"-6")	120°F	1/2 hour	6
HB-3 (6"-12")	150°F	1/2 hour	2
HB-4 (6"-12")	125°F	1/2 hour	18
HB-7 (0"-6")	125°F	1/2 hour	10
HB-8 (0"-6")	125°F	1/2 hour	6
HB-18 (2 1/2'-3')	125°F	1/2 hour	50
HB-18 (4'-4 1/2')	125°F	1/2 hour	39
HB-19 (2 1/2'-3')	125°F	1/2 hour	24
HB-19 (4 1/2'-5')	125°F	1/2 hour	40
HB-20 (0"-6")	140°F	1/2 hour	15
HB-20 (5'-5 1/2')	140°F	1/2 hour	8
HB-21 (30"-36")	140°F	1/2 hour	38

* All samples listed in this table were retained for VOC analysis by laboratory as per USEPA Method 624. See Appendix E for all OVA results.

(1) ppm - Parts per million relative to the OVA reaction to a methane standard

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Pb, Hg, Ag, Ni and Zn), 24 soil samples were tested for PP VOCs and two (2) soil samples were tested for the full PP parameters. Furthermore, a total of six (6) trip blanks and five (5) field blanks were tested for PP VOCs, four (4) field blanks and one (1) trip blank were tested for metals, and two (2) trip blanks and two (2) field blanks were tested for full PP parameters.

SOIL SAMPLING RESULTS FROM RI (1990)

The results of all soil analyses will be presented in this sub-section according to the sampling locations, as listed in Table 3.2.2.1.

BENEATH SLUDGE DRYING BEDS

A total of twelve (12) soil samples were obtained from beneath the former sludge drying beds (soils were sampled from six (6) borings at two (2) depths). The sludge drying beds were used to accept the hydroxide sludge (lime sludge) for drying. The sludge drying beds (constructed of concrete) were destroyed and removed from the Site in order to obtain access to the underlying soils. Soils beneath the beds were sampled to detect the presence of metals and, at some locations, PP VOCs. The OVA results of the soil sample headspace necessitated PP VOC analysis for HB-1 (0 to 6 inches), HB-3 (6 to 12 inches), HB-4 (6 to 12 inches), HB-7 (0 to 6 inches) and HB-8 (0 to 6 inches). See Table 3.2.2.2 for the summary of OVA screening results.

Table 3.2.2.3 was constructed to show the laboratory results of the twelve (12) soil samples tested from beneath the sludge drying beds (see Figure 3.2.2.2 for locations of sampling).

OUTSIDE SLUDGE DRYING BEDS

A total of five (5) soil samples were obtained from outside the sludge drying beds (from three (3) borings, of which two (2) boring locations were tested at two (2) different depths and one (1) was tested at one (1) depth). This location was sampled due to the proximity to the sludge drying beds and to determine the possibility of spillage and leakage

TABLE 3.2.2.3*
LABORATORY RESULTS OF SOIL SAMPLING BENEATH SLUDGE DRYING BEDS
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # - SAMPLE DEPTH - SAMPLE DATE -	HB-1[1] (0"-6") 6/2	HB-1 (6"-12") 6/2	HB-2 (0"-6") 6/2	HB-2 (6"-12") 6/2	HB-3 (0"-6") 6/2	HB-3 (6"-12") 6/2	HB-4 (0"-3") 6/2	HB-4 (6"-12") 6/2	HB-7 (0"-6") 6/2	HB-7 (30"-36") 6/2	HB-8 (0"-6") 6/2	HB-8 (30"-36") 6/2
METALS (mg/kg)														
Antimony			UD	UD	UD	UD	UD	15	UD	UD	UD	UD	UD	UD
Beryllium			UD	UD	UD	UD	UD	0.758	UD	UD	UD	UD	UD	UD
Arsenic	0.01		2.9	1.7	2.2	1.5	2.2	1.82	1.6	1.4	1.4	1.6	1.5	1.5
Cadmium	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01		25	18.2	19.4	12.4	21.1	17.0	25.3	20	15	14.8	23	7.4
Copper	0.025		61.7	37.2	47.2	38.8	50.9	34.0	65	53.7	23	27.0	45	14.0
Lead	0.005		157	65.7	87.7	21.7	82.3	46.3	36.7	53.1	15.9	25.0	42.5	18.9
Mercury	0.0002		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04		12.3	2.8B	6.2	2.7B	5.5B	4.5B	3.4B	3.6B	3.5B	940B	3.2B	2.5B
Silver	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		180	66.5	77.7	24.2	150	6.4	71.0	73.7	21	32	50	31.0
VOLATILE ORGANIC COMPOUNDS (mg/kg)														
VOCs														
Methylene Chloride	0.005		0.010B	--	--	--	--	1.900B	--	0.008B	0.045B	--	0.034B	--
TOTAL VOCs	(2)		0.010	--	--	--	--	1.900	--	0.008	0.045	--	0.034	--
TENTATIVELY IDENTIFIED VOCs														
Trifluoroethane			UD	--	--	--	--	0.033J	--	UD	UD	--	UD	--
Hexamethyltrisiloxane			UD	--	--	--	--	2.800J	--	UD	UD	--	UD	--
Difluorodimethylsilane			0.130JB	--	--	--	--	UD	--	UD	0.023JB	--	0.019JB	--
Hexanol			UD	--	--	--	--	UD	--	UD	0.011J	--	0.006J	--
Unknowns			0.007J	--	--	--	--	UD	--	UD	0.150J	--	0.080J	--
Other Unknowns (also detected in blanks)			0.056JB	--	--	--	--	0.100JB	--	0.015JB	0.048JB	--	0.026JB	--
TOTAL TENTATIVELY IDENTIFIED VOCs			0.193	--	--	--	--	2.933	--	0.015	0.232	--	0.131	--
TOTAL VOCs			0.203	--	--	--	--	4.833	--	0.023	0.277	--	0.165	--
BASE NEUTRAL EXTRACTABLES (mg/kg)														
Phenanthrene	0.33		--	--	--	--	--	0.210J	--	--	--	--	--	--
Fluoranthene	0.33		--	--	--	--	--	0.250J	--	--	--	--	--	--
Pyrene	0.33		--	--	--	--	--	0.240J	--	--	--	--	--	--
Bis (2-Ethylhexyl) phthalate	0.33		--	--	--	--	--	1.700B	--	--	--	--	--	--
TOTAL BASE NEUTRAL EXTRACTABLES			--	--	--	--	--	2.400J	--	--	--	--	--	--
TOTAL ACID EXTRACTABLES (mg/kg)			--	--	--	--	--	UD	--	--	--	--	--	--
TOTAL PCBs (mg/kg)			--	--	--	--	--	UD	--	--	--	--	--	--
PESTICIDES (mg/kg)														
Heptachlor	0.008		--	--	--	--	--	0.0063J	--	--	--	--	--	--
Heptachlor epoxide	0.008		--	--	--	--	--	0.0027J	--	--	--	--	--	--
Endosulfan I	0.008		--	--	--	--	--	0.019	--	--	--	--	--	--
TOTAL PESTICIDES			--	--	--	--	--	0.028	--	--	--	--	--	--

* - See Appendix F for laboratory results of trip blanks and field blank.
(1) - See Figure 3.2.2.2 for sampling locations
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
-- - Not analyzed
UD - Undetected
B - Detected in method blank
J - Below mean quantification level of lab
CRQL - Contract Required Quantification Limit

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from the piping. The results of the OVA screening of the soil headspace for each sample did not necessitate PP VOC analysis (see Appendix E).

Table 3.2.2.4 shows the laboratory results of the five (5) soil samples obtained from outside the sludge drying beds. Figure 3.2.2.2 shows the locations of these borings.

ALONG PIPELINE

The results of the investigation of the underground pipeline indicated the presence of a PVC pipe between the building and the leaching pit (as shown in Figure 3.2.2.1). As a result, a total of seven (7) boring locations were sited along this path and seven (7) soil samples were subsequently obtained (see Figure 3.2.2.2). The purpose of the sampling along the pipeline was to detect the presence of select metals in the shallow soils that may have been introduced at these locations due to possible leakage of the pipe that once carried the supernatant water from the flocculation tank to the leaching pit. The results of the OVA screening of the soil headspace for each sample did not necessitate PP VOC analysis (see Appendix E).

The laboratory results for soil samples obtained along the pipeline are presented in Table 3.2.2.5.

STEAM COOKER DISCHARGE AREA

A total of two (2) soil samples were obtained from the area that had been identified as the steam cooker discharge area. The samples were obtained from one boring (HB-10) at two (2) different depths. The discharge area was identified as a clogged drain. The purpose of these samples were to detect the presence of metals in the shallow soils (in the drain) and to obtain vertical concentrations at depth, in this location where wastewater (steam condensate) was discharged from the steaming process after the fabric dying. The results of the OVA screening of the soil headspace for each sample did not necessitate PP VOC analysis (see Appendix E).

Table 3.2.2.6 shows the results of the laboratory analysis for the soil samples obtained

TABLE 3.2.2.4*
LABORATORY RESULTS OF SOIL SAMPLING
OUTSIDE SLUDGE DRYING BEDS
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - / SAMPLE DEPTH - / SAMPLE DATE -	HB-5 (0"-6") 6/2	HB-5 (24"-30") 6/2	HB-6 (0"-6") 6/2	HB-6 (24"-30") 6/2	HB-9 (36"-42") 6/2
METALS (mg/kg)							
Arsenic	0.01		1.8	5.5	4.7	5.6	3.8
Cadmium	0.005		UD	UD	UD	UD	UD
Chromium	0.01		19.0	12	10	13	18.0
Copper	0.025		53	4.8	5.0	6.2	58.0
Lead	0.005		157	17.3	174	21.6	227
Mercury	0.0002		UD	UD	UD	UD	UD
Nickel	0.04		11	5.3B	5.8B	7.5	13.0
Silver	0.01		UD	UD	UD	UD	UD
Zinc	0.02		220	24	22	42	250

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
UD - Undetected
B - Contaminant detected in Method Blank
CRQL - Contract Required Quantification Limit

TABLE 3.2.2.5*
LABORATORY RESULTS OF SOIL SAMPLING
ALONG PIPELINE
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE -	HB-11 (0"-6") 6/3	HB-12 (6"-12") 6/3	HB-13 (6"-12") 6/3	HB-14 (6"-12") 6/3	HB-15 (0"-6") 6/3	HB-16 (6"-12") 6/3	HB-17 (6"-12") 6/3
METALS (mg/kg)									
Arsenic	0.01		5.2	14	16	17	6.3	220	18
Cadmium	0.005		UD	UD	UD	UD	UD	UD	2.9
Chromium	0.01		105	21.1	22.6	22.1	28.9	29.6	750
Copper	0.025		315	86.6	113	82.7	49.8	73.3	750
Lead	0.005		90	154	371	59.0	160	157	180
Mercury	0.0002		UD	UD	0.22	UD	0.54	UD	UD
Nickel	0.04		7.3	12.2	20.7	8.7	15.7	27.7	19.2
Silver	0.01		UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		260	210	490	190	220	140	860

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
UD - Undetected
CRQL - Contract Required Quantification Limit

TABLE 3.2.2.6*
LABORATORY RESULTS OF SOIL SAMPLING
STEAM COOKER DISCHARGE AREA
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE -	HB-10 (6"-12") 6/2	HB-10 (AT 18") 6/2
METALS (mg/kg)				
Arsenic	0.01		1.5	2.0
Cadmium	0.005		UD	UD
Chromium	0.01		6.5	17.0
Copper	0.025		50.0	54.0
Lead	0.005		44.4	95.4
Mercury	0.0002		UD	UD
Nickel	0.04		28	40.0
Silver	0.01		UD	UD
Zinc	0.02		190	260

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
UD - Undetected
CRQL - Contract Required Quantification Limit

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in the steam cooker discharge area (see Figure 3.2.2.2 for location of HB-10).

LEACHING PIT (SHALLOW BORINGS)

A total of twelve (12) shallow soil samples were obtained from within the boundaries of the former leaching pit (four (4) boring locations at three (3) depths). The purpose of sampling the soils at three (3) different depths within the four (4) borings in the leaching pit was to determine the concentrations of metals and, in some locations, PP VOCs within the soils to delineate the vertical and lateral extent of the possible contamination that may have been introduced into the soils from the past alleged discharge of supernatant liquid from the flocculation tank. The results of the OVA screening of soil headspace for each sample necessitated PP VOC analysis for HB-18 (30"-36"), HB-18 (48"-54"), HB-19 (30"-36"), HB-19 (54"-60"), HB-20 (0"-6"), HB-20 (60"-66"), and HB-21 (30"-36"). See Table 3.2.2.2 for the summary OVA screening results.

The laboratory results are presented in Table 3.2.2.7.

LEACHING PIT (BORING TO WATER TABLE)

A total of nine (9) soil samples were obtained at TB-2 (within the leaching pit) on Figure 3.2.2.2 (see Table 3.2.2.8 for laboratory results of the soil samples). It should be noted that in Table 3.2.2.8, the sample depths begin at TB-2 (10'-12'). This was the grade level before filling in the leaching pit. The leaching pit was too steep to access a drilling rig, hence, a ramp was created to obtain the sample. Transit shots were taken to determine the exact level of grade prior to filling it in.

BACKGROUND SAMPLE (BIRCH LANE CIRCLE NORTH)

A total of two (2) soil samples were obtained within one (1) boring located on Birch Lane Circle North as shown in Figure 3.2.2.3. These soil samples were obtained for the purpose of determining background conditions of natural (undisturbed) soils in the vicinity of the Site. The surrounding area of soil samples obtained on Birch Lane Circle North was noted to be residential.

TABLE 3.2.2.7*
LABORATORY RESULTS OF SOIL SAMPLING
LEACHING PIT
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE -	HB-18 (0"-6") 6/3	HB-18 (30"-36") 6/3	HB-18 (48"-54") 6/3	HB-19 (0"-6") 6/3	HB-19 (30"-36") 6/3	HB-19 (54"-60") 6/3	HB-20 (0"-6") 6/6	HB-20 (30"-36") 6/6	HB-20 (60"-66") 6/6	HB-21 (0"-6") 6/6	HB-21 (30"-36") 6/6	HB-21 (60"-66") 6/6
METALS (mg/kg)														
Arsenic	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Cadmium	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01		104	37.8	UD	46.6	3.8	5.3	14.1	4.0	10.6	26.8	5.7	7.8
Copper	0.025		93.5	24.9	11.9	43.5	3.1	2.6	15.3	11.4	4.9	19.7	2.8	4.1
Lead	0.005		56	20	3.0	19	17	0.8	17	1.7	1.5	28.0	1.1	1.8
Mercury	0.0002		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04		UD	UD	UD	2.4	UD	UD	UD	0.9	UD	UD	UD	UD
Silver	0.01		UD	UD	UD	8.1	UD	UD	UD	UD	UD	150	150	UD
Zinc	0.02		67.7	24	6.6	60.8	3.5	3.9	59.3	7.9	4.6	72	5.3	8.3
VOLATILE ORGANIC COMPOUNDS (mg/kg)														
VOCs														
Methylene Chloride	0.005		--	0.014B	0.010B	--	0.010B	0.010B	0.010B	--	NR	--	0.004JB	--
1,1,1-Trichloroethane	0.005		--	0.002JB	UD	--	UD	UD	UD	--	NR	--	UD	--
TOTAL VOCs	(2)		--	0.016	0.010		0.010	0.010	0.010	--	NR	--	0.004	--
TENTATIVELY IDENTIFIED VOCs														
2-propanone			--	0.019J	0.160J	--	0.090J	0.034J	0.470J	--	NR	--	0.054J	--
1-Methoxy-2-propanone			--	0.250JB	UD	--	UD	UD	UD	--	NR	--	0.018JB	--
3-Carene			--	UD	UD	--	UD	UD	0.080	--	NR	--	UD	--
4-methylene-1-(1-Methy-bicyclo (31.0) hexane			--	UD	UD	--	UD	UD	0.018J	--	NR	--	UD	--
Unknown Alkene			--	0.009J	UD	--	UD	UD	UD	--	NR	--	UD	--
Other Unknowns			--	0.220JB	0.089JB	--	0.097JB	0.083JB	0.077JB	--	NR	--	0.160JB	--
TOTAL TENTATIVELY IDENTIFIED VOCs			--	0.498	0.249	--	0.187	0.117	0.645	--	NR	--	0.232	--
TOTAL VOCs			--	0.514	0.259	--	0.197	0.127	0.655	--	NR	--	0.236	

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
UD - Undetected
-- - Not Analyzed
NR - Not reportable due to interference
B - Detected in Method Blank
J - Below mean quantification level of lab

TABLE 3.2.2.8*
LABORATORY RESULTS OF SOIL SAMPLING
LEACHING PIT TEST BORING
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID #(1) / SAMPLE DEPTH / SAMPLE DATE	TB-2 (10'-12') 7/13	TB-2 (12'-14') 7/13	TB-2 (14'-16') 7/13	TB-2 (16'-18') 7/13	TB-2 (18'-20') 7/13	TB-2 (20'-22') 7/13	TB-2 (22'-24') 7/13	TB-2 (24'-26') 7/13	TB-2 (26'-28') 7/13
METALS (mg/kg)											
Antimony	0.06		UD	UD	UD	UD	UD	UD	UD	UD	UD
Arsenic	0.01		UD	UD	UD	2.1	UD	4.8	UD	UD	2.2
Beryllium	0.005		UD	UD	UD	0.42B	UD	UD	UD	UD	UD
Cadmium	0.005		UD	UD	UD	1.5	UD	UD	UD	UD	UD
Chromium	0.01		17.0	10.9	7.8	11.2	13.5	5.9	3.2	16.6	21.5
Copper	0.025		16.8	12.8	12.4	12.2	12.0	9.7	1.5B	2.5B	9.3
Iron	0.1		UD	UD	UD	70.0	UD	UD	UD	UD	UD
Lead	0.005		13.7	9.5	3.9	7.0	8.2	14.5	3.6	3.2	1.7
Mercury	0.0002		UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04		3.0B	0.21	1.8B	3.2B	3.9B	1.3B	2.6B	2.1B	UD
Silver	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		11.3	15.0	7.3	15.8	22.0	8.8	5.6	7.5	9.1
VOLATILE ORGANIC COMPOUNDS (mg/kg)											
VOCs											
Methylene Chloride	0.005		--	--	--	0.068B	--	--	--	0.020B	--
Toluene	0.005		--	--	--	0.002J	--	--	--	UD	--
Acrolein	(2)		--	--	--	0.460	--	--	--	UD	--
1,1-Dichloroethene	0.005		--	--	--	UD	--	--	--	UD	--
Chloroform	0.005		--	--	--	UD	--	--	--	UD	--
Trichloroethene	0.005		--	--	--	UD	--	--	--	UD	--
Dibromochloromethane	0.005		--	--	--	UD	--	--	--	UD	--
Tetrachloroethene	0.005		--	--	--	UD	--	--	--	UD	--
1,1,2,2-Tetrachloro-ethane	0.005		--	--	--	UD	--	--	--	UD	--
Chlorobenzene	0.005		--	--	--	UD	--	--	--	UD	--
TOTAL VOCs			--	--	--	0.530	--	--	--	0.020	--
TENTATIVELY IDENTIFIED VOCs											
2-Propanone			--	--	--	0.060JB	--	--	--	0.100JB	--
1,1,2-Trichloro-1,2,2-Trifluoro-ethane			--	--	--	0.018J	--	--	--	0.030J	--
Hexane			--	--	--	UD	--	--	--	0.010J	--
Unknowns			--	--	--	0.008J	--	--	--	UD	--
TOTAL TENTATIVELY IDENTIFIED VOCs			--	--	--	0.086	--	--	--	0.140	--
TOTAL VOCs			--	--	--	0.616	--	--	--	0.160	--
BASE NEUTRAL EXTRACTABLES (mg/kg)											
Diethyl phthalate			--	--	--	0.340	--	--	--	--	--
Bis (2-Ethylhexyl) phthalate			--	--	--	0.500B	--	--	--	--	--
TOTAL BASE NEUTRAL EXTRACTABLES			--	--	--	0.840	--	--	--	--	--
TOTAL ACID EXTRACTABLES (mg/kg)			--	--	--	UD	--	--	--	--	--
POLYCHLORINATED BIPHENYLS			--	--	--	UD	--	--	--	--	--
TOTAL PESTICIDES			--	--	--	UD	--	--	--	--	--

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
-- - Not Analyzed ---- UD - Undetected
B - Detected in Method Blank ---- J - Below mean quantification level of lab

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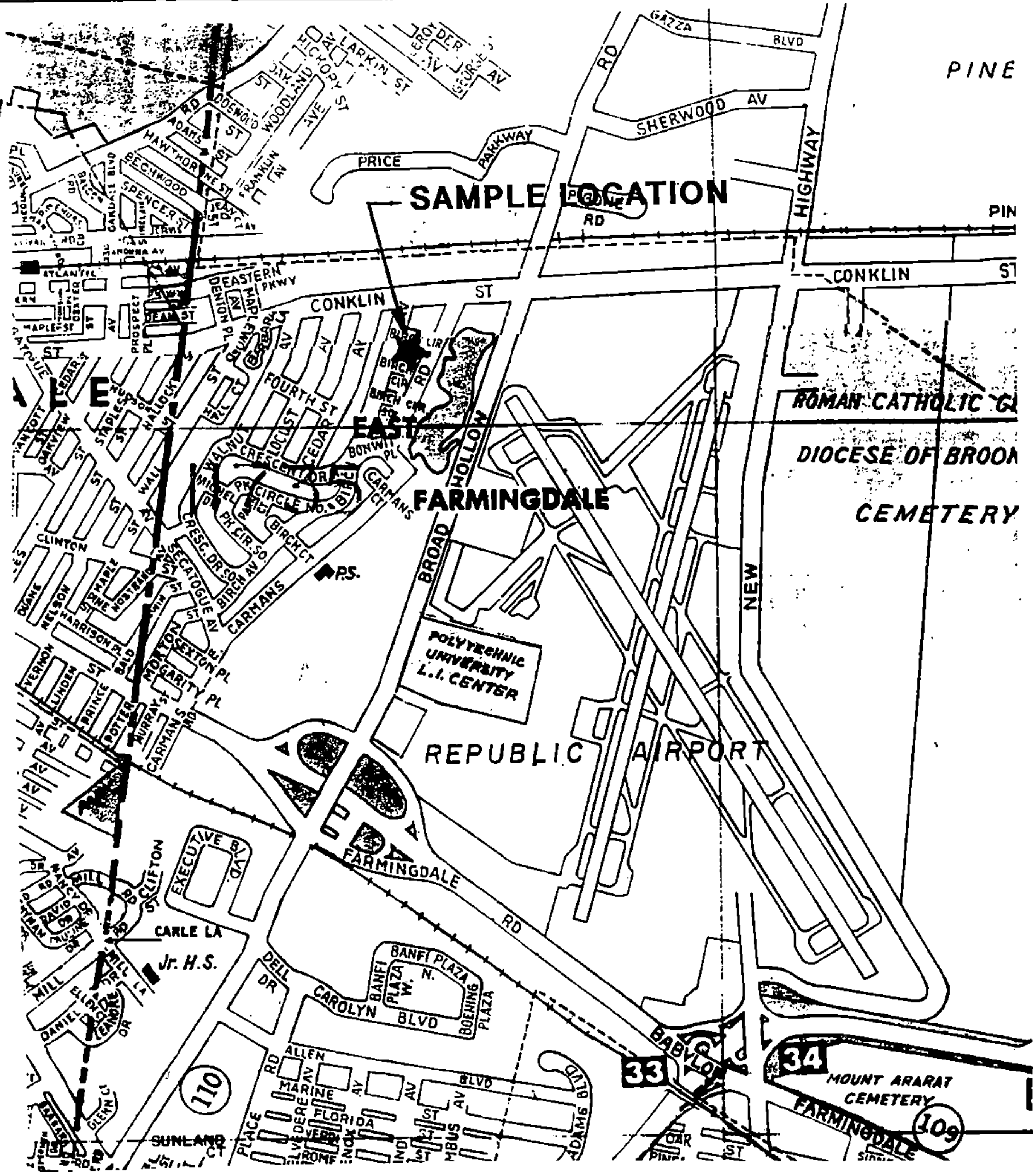

Scale in Feet (Approximate)

0 2000 4000 6000 8000

1 Mile

FIGURE 3.2.2.3 – LOCATION OF BIRCH LANE CIRCLE NORTH SAMPLE

F,P&M

Table 3.2.2.9 shows the results of the soil sampling analysis for the two (2) samples.

LEACHING POOLS (IN THE VICINITY OF FORMER HYDROXIDE SLUDGE DRUM STORAGE AREA)

A total of three (3) soil samples were collected from the bottom of three (3) leaching pools located on Site (as shown in Figure 3.2.2.2). The soil samples were obtained from the upper-most soils at the bottom of each leaching pool. The purpose of sampling the soils at these locations was to detect the presence of contaminants possibly introduced by the former drum storage of hydroxide sludge. The results of the OVA screening of soil headspace for each sample necessitated PP VOC analysis for all three (3) samples obtained from the leaching pools.

The laboratory results are presented in Table 3.2.2.10.

TEST BORING IN FORMER SOLVENT DRUM STORAGE AREA (TO WATER TABLE)

Based upon the OVA results of soil headspace for each sample (Appendix E), PP VOC analysis was performed on four (4) soil samples that were obtained at different depths within boring TB-1 (as indicated in Figure 3.2.2.2).

Table 3.2.2.11 shows the laboratory results of the soil sampling at TB-1.

SOILS AT WELL LOCATIONS

Split-spoon soil samples were obtained from the boreholes during the drilling of groundwater monitoring wells (over 5' increments) and the headspace of each soil sample was screened with the OVA for total organic vapors (see Appendix E for results). Table 3.2.2.2 summarizes the samples that were tested for PP VOCs as a result of the OVA headspace analysis.

Table 3.2.2.12 presents the laboratory results from the well borings.

3.2.3 CHEMICAL CHARACTERISTICS OF GROUNDWATER AND DISCHARGE WATER

GROUNDWATER

A total of five (5) groundwater monitoring wells were installed as part of the RI study

TABLE 3.2.2.9*
LABORATORY RESULTS OF SOIL SAMPLING
BACKGROUND SAMPLES
(BIRCH LANE CIRCLE NORTH)
OFF-SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID #(1) SAMPLE DEPTH SAMPLE DATE	BLCN (0"-6") 6/06/88	BLCN (24"-30") 6/06/88
METALS (mg/kg)				
Arsenic	0.01		40.0	UD
Cadmium	0.005		0.7	UD
Chromium	0.01		26.1	6.9
Copper	0.25		6.6	2.4
Lead	0.005		23.0	3.1
Mercury	0.0002		0.24	UD
Nickel	0.04		10.7	2.0
Silver	0.01		UD	UD
Zinc	0.02		39.3	11.5
VOLATILE ORGANIC COMPOUNDS (mg/kg)				
VOCs				
Methylene Chloride	0.005		0.004JB	0.008B
TOTAL VOCs			0.004	0.008
TENTATIVELY IDENTIFIED VOCs				
2-Propanone	(2)		0.023J	UD
1-Methoxy-2-propanone			0.012JB	0.011JB
Unknown alkene			0.021JB	UD
Other unknowns (also detected in blanks)			0.130JB	0.076JB
TOTAL TENTATIVELY IDENTIFIED VOCs			0.186	0.087
TOTAL VOCs			0.190	0.095

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling location.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
UD - Undetected
NA - Not Applicable
B - Detected in Method Blank
J - Below mean quantification level of lab

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TABLE 3.2.2.10*
LABORATORY RESULTS OF SOIL SAMPLING
LEACHING POOLS
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) SAMPLE DATE	LP-1 5/27-5/31	LP-2 5/27-5/31	LP-3 5/27-5/31
METALS (mg/kg)					
Arsenic	0.01		UD	UD	8.9
Cadmium	0.005		UD	6.7	2.9
Chromium	0.01		31.5	110	55
Copper	0.025		92	790	160
Lead	0.005		440	470	890
Mercury	0.0002		0.40	7.0	0.90
Nickel	0.04		13.5	12.2B	39
Silver	0.01		UD	UD	UD
Zinc	0.02		390	702	570
VOLATILE ORGANIC COMPOUNDS (mg/kg)					
VOCs					
Methylene Chloride	0.005		0.075B	0.260B	0.099B
1,2-Dichloroethene (total)	0.005		UD	1.200	0.003J
Chloroform	0.005		0.002J	0.013J	0.003J
Trichlorofluoromethane	(2)		0.006	0.004J	0.002J
Toluene	0.005		0.025	4.200	UD
Chlorobenzene	0.005		0.017	0.038	UD
Ethylbenzene	0.005		0.690	0.230	UD
Tetrachloroethene	0.005		UD	0.059	UD
TOTAL VOCs			0.815	6.004	0.107
TENTATIVELY IDENTIFIED VOCs					
2-Propanone			0.34JB	0.880JB	UD
Methylcyclohexane			0.240J	UD	UD
3-Ethyl-2-Methylpentane			0.110J	UD	UD
Ethylcyclohexane			0.100J	UD	UD
1-Nitroethylbenzene			0.950J	UD	UD
m-Xylene			0.950J	0.670J	UD
o,p-Xylene			0.370J	1.100J	UD
2-Methoxy-2-Methylpropane			UD	0.370J	UD
(E,E)-2-4-Heptadien 6-ynal			UD	1.100J	UD
1,1,3-Trimethylcyclohexane			UD	0.310J	UD
1-Methylethylbenzene			UD	0.980J	UD
Unknown substitute benzene			UD	1.300J	UD
2-3-Heptadiene 5-yne-3,4-dimethyl			UD	UD	6.600J
cis-1-Ethyl-2-methylcyclohexane			UD	UD	0.390J
1,1,3-Trimethyl cyclopentane			UD	UD	1.400J
Octahydropentalene			UD	UD	1.200J
Bromocycloheptane			UD	UD	0.640J
2-Ethyl-1,3-dimethylcyclohexane			UD	UD	0.540J
N-N-carbonyl bis-acetamine			UD	UD	0.400J
2,2,3,3-Tetramethylbutane			UD	UD	0.970J
5-Butoxy-Pentane			UD	UD	1.100J
Unknown alkane			UD	UD	0.500J
Unknowns			8.820J	9.600J	UD
TOTAL TENTATIVELY IDENTIFIED VOCs			11.880	16.310	13.740
TOTAL VOCs			12.695	22.314	13.847

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of lab

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TABLE 3.2.2.11*
LABORATORY RESULTS OF SOIL SAMPLING
TEST BORINGS
(IN FORMER SOLVENT DRUM STORAGE AREA)
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE I.D.(1) - SAMPLE DEPTH - SAMPLE DATE -	TB-1 (4'-6') 5/26	TB-1 (8'-10') 5/26	TB-1 (18'-20') 5/26	TB-1 (22'-24') 5/26
VOLATILE ORGANIC COMPOUNDS (mg/kg)						
VOCs						
Methylene Chloride	0.005		0.007B	UD	UD	UD
Toluene	0.005		0.003J	UD	UD	UD
1,1-Dichloroethene	0.005		0.003J	UD	UD	UD
Chloroform	0.005		0.003J	UD	UD	UD
Trichloroethene	0.005		0.002J	UD	UD	UD
Dibromochloromethane	0.005		0.004J	UD	UD	UD
Tetrachloroethene	0.005		0.006	UD	UD	UD
1,1,2,2-Tetrachloroethane	0.005		0.003J	UD	UD	UD
Chlorobenzene	0.005		0.003J	UD	UD	UD
TOTAL VOCs	(2)		0.034	UD	UD	UD
TENTATIVELY IDENTIFIED VOCs						
2-Propanone			UD	0.006J	0.005J	0.006J
Hexane			UD	0.014JB	0.015J	0.016JB
TOTAL TENTATIVELY IDENTIFIED VOCs			UD	0.020	0.020	0.022
TOTAL VOCs			0.034	0.020	0.020	0.022

* - See Appendix F for Laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
UD - Undetected
-- - Not Analyzed
B - Detected in Method Blank
J - Below mean quantification level of lab.

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TABLE 3.2.2.12*
LABORATORY RESULTS OF SOIL SAMPLING
WELL BORINGS
SJ&J SITE
FARMINGDALE, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) SAMPLE DEPTH SAMPLE DATE	WELL-1 (20'-22') 5/31/88	WELL-3 (25'-27') 5/27/88	WELL-4 (15'-17') 5/31/88
VOLATILE ORGANIC COMPOUNDS (mg/kg)					
VOCs					
Methylene Chloride	0.005		0.032B	0.041B	0.017B
Chloroform	0.005		UD	0.001J	UD
TOTAL VOCs			0.032	0.042	0.017
TENTATIVELY IDENTIFIED VOCs					
4-Methyl-2-Pentanamine	(2)		0.016J	0.018J	UD
Diflourodimethylsilane			UD	0.160J	UD
2-Propanone			UD	0.200JB	UD
2,5-Dimethyl hexane			0.190J	UD	UD
3,6-Dimethyl octane			0.720J	UD	UD
Butyl Isopropyl Sulfane			0.062J	UD	UD
4-Azido-heptane			0.038J	UD	UD
2,3,7-Trimethyloctane			0.130J	UD	UD
Unknown amine			UD	UD	0.020J
Decane			UD	UD	0.930J
4-Methyl-2-propyl-1-pentanol			UD	UD	0.026J
Unknowns			0.640J	0.004J	UD
TOTAL TENTATIVELY IDENTIFIED VOCs			1.796	0.382	0.976
TOTAL VOCs			1.828	0.424	0.993

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
CRQL - Contract Required Quantification Limit
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of lab

(1990), four (4) of which were on Site and one (1) upgradient at Levitz's (north of the Long Island Rail Road). A summary of each well installation and development is presented in Table 3.1.4.1 and the locations of the five (5) monitoring wells are shown in Figure 3.2.2.2. These wells were constructed according to DEC monitoring well specifications (1988).

Prior to sampling groundwater from each of the five (5) wells, the wells were exhausted a minimum of four (4) volumes and measurements of the pH, specific conductance, and temperature were recorded after each of the well volumes that were exhausted. Table 3.2.3.1 shows the well stabilization measurements that were recorded prior to sampling for each of the five (5) wells. Table 3.2.3.1 shows each well number, the measurement (which was taken following the exhausting of one well volume from each well), the pH, specific conductance, and temperature.

The results of groundwater testing for each of the five (5) wells are shown in Table 3.2.3.2 (see Figure 3.2.2.2 for locations).

<u>DISCHARGE WATER</u>

During the sampling effort of the RI, a sample of water from the former flocculation tank was obtained and analyzed for full priority pollutant parameters. This sample was labeled as coming from the old industrial wastewater settling tank. The results of the lab analysis for the industrial wastewater is shown in Table 3.2.3.3.

In addition, a water sample was obtained from a broken pipe which was observed during the Site investigation. This pipe was identified incorrectly in the RI report (Reference 4) as a steam condensate drain pipe from the steam cooker. The "broken pipe" was a black plastic pipe which was encountered (and broken) during the installation of monitoring well SW-1 (formerly MW-1). The water sample was taken from the broken pipe in order to determine if the discharge contaminated the soil at this location. The broken pipe was repaired within 24 hours. The water sample was tested by the laboratory for full PP. The laboratory results of this sample are shown in Table 3.2.3.3 (indicated as broken pipe).

TABLE 3.2.3.1
WELL STABILIZATION MEASUREMENTS*
Prior to Sampling
July 21, 1988
SJ&J Site
Farmingdale, NY

Well Number	Measurement (1)	Well Volume Exhausted	pH	Specific Conductance (umhos/cc)	Temperature (°F)
MW-1	1st	2	7.8	210	57.2
MW-1	2nd	3	7.8	220	N.T. (2)
MW-1	3rd	4	7.8	220	57.2
MW-1	4th	5	7.8	220	N.T.
MW-2	1st	2	7.7	570	59.9
MW-2	2nd	3	7.6	520	59.0
MW-2	3rd	4	7.6	520	N.T.
MW-2	4th	5	7.6	450	N.T.
MW-2	5th	6	7.6	510	59.0
MW-2	6th	7	7.6	520	N.T.
MW-3	1st	2	7.6	250	N.T.
MW-3	2nd	3	7.6	240	61.7
MW-3	3rd	4	7.6	240	61.7
MW-3	4th	5	7.5	240	N.T.
MW-4	1st	2	7.8	300	N.T. (3)
MW-4	2nd	3	7.8	290	N.T.
MW-4	3rd	4	7.8	300	N.T.
MW-5	1st	2	8.0	270	N.T.
MW-5	2nd	3	8.0	300	N.T.
MW-5	3rd	4	8.0	290	N.T.

* All wells were exhausted a minimum of four volumes of water prior to stability measurements of each well (see Figure 3.2.2.2 for well location).

(1) Each measurement was taken following the exhausting of one well volume of water from each well.

(2) N.T. - Not Tested

(3) Temperature gauge broke at this point.

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TABLE 3.2.3.2*
LABORATORY RESULTS OF GROUNDWATER SAMPLING
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/l	MW-1 Unfiltered	MW-1 Filtered	MW-2 Unfiltered	MW-2 Filtered	MW-3 Unfiltered	MW-3 Filtered	MW-4 Unfiltered	MW-4 Filtered	MW-5 Unfiltered	MW-5 Filtered
METALS (mg/l)											
Antimony	0.06	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Arsenic	0.01	UD	UD	UD	UD	UD	UD	0.011	UD	UD	UD
Beryllium	0.005	UD	UD	0.002B	UD	UD	UD	UD	UD	UD	UD
Cadmium	0.005	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01	UD	UD	0.013	UD	0.011	UD	0.009B	UD	UD	UD
Copper	0.025	0.057	0.009B	0.053	0.005B	0.056	0.003B	0.081	0.006B	0.030	0.019B
Lead	0.005	0.023	0.002B	0.017	UD	**0.40**	0.003B	**0.054**	0.007	0.013	UD
Mercury	0.0002	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04	0.006B	0.008B	0.010B	0.005B	0.023B	0.007B	0.013	UD	0.062	UD
Selenium	0.005	UD	UD	UD	UD	UD	UD	--	--	UD	UD
Thallium	0.01	--	--	UD	UD	UD	UD	--	--	UD	UD
Zinc	0.02	0.078	0.031	0.034	0.054	0.053	0.053	0.094	0.060	0.034	0.066

	SAMPLE DATE	MW-2 07/21/88	MW-3 07/21/88	MW-4 07/21/88	MW-5 07/21/88
VOLATILE ORGANIC COMPOUNDS (mg/l)					
VOCs					
Chloromethane	0.01	0.039	**0.190**	UD	0.015
Methylene Chloride	0.005	0.014B	**0.160B**	0.006	0.008JB
1,1-Dichloroethane	0.005	UD	UD	0.005	UD
1,2-Dichloroethene (Total)	0.005	0.003J	UD	UD	UD
1,2-Dichloroethane	0.005	UD	UD	0.008	UD
1,1,1-Trichloroethane	0.005	0.007	0.004J	0.010	UD
Trichloroethene	0.005	0.005B	UD	0.005JB	0.004JB
Benzene	0.005	UD	UD	UD	0.008J
Tetrachloroethene	0.005	**0.140**	UD	UD	UD
Toluene	0.005	UD	UD	0.003J	0.010
Chlorobenzene	0.005	UD	UD	UD	0.010
TOTAL VOCs		0.208	0.354	0.037	0.055
TENTATIVELY IDENTIFIED VOCs (mg/l)**					
Unknowns	(2)	UD	0.960J	UD	UD
2-Propanone		0.023J	0.470J	0.013	UD
1,2-Dimethoxyethane		UD	0.190	UD	UD
1-(2-Methoxyethoxy) -Butane		UD	0.030J	UD	UD
3-Methyl-2-Butanone		UD	0.072J	UD	UD
3-Methyl Pentane		UD	0.130J	UD	UD
Butanoicacid Methylester		UD	0.069J	UD	UD
2-Butanone (Methyl-ethyl Ketone)		UD	0.925J	UD	UD
Hexane		UD	UD	UD	0.020J
Ethanol		UD	UD	0.360J	UD
Dimethoxy Methane		UD	UD	0.140	UD
Other Unknowns		1.400JB	0.420JB	1.800JB	0.080JB
TOTAL TENTATIVELY IDENTIFIED VOCs		1.423	3.266	2.313	0.100
TOTAL VOCs		1.631	3.620	2.35	0.155
BASE NEUTRAL EXTRACTABLES (mg/l)					
Bis(2-Ethylhexyl)phthalate		0.007JB	0.011B	UD	0.017B
Di-n-octylphthalate		0.002J	0.006J	UD	UD
TOTAL BASE NEUTRAL EXTRACTABLES		0.009	0.017	--	0.017
TOTAL ACID EXTRACTABLES (mg/l)		UD	UD	--	UD

* - See Appendix F for laboratory results of trip blanks and field blanks.
(1) - See Figure 3.2.2.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
** - Carbon dioxide results were not included
CRQL - Contract Required Quantification Limit
B - Detected in Method Blank
J - Below mean quantification of laboratory
-- - Not Analyzed
UD - Undetected
NS - No class GA standard
Bold - Bold numbers indicate exceedence of GA Standards

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TABLE 3.2.3.3*
LABORATORY RESULTS FOR WATER SAMPLES OBTAINED FROM VARIOUS SOURCES
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT(1)	CRQL mg/l	Old Industrial Waste Water Settling Tank	Broken Pipe
METALS (mg/l)			
Arsenic	0.01	UD	UD
Cadmium	0.005	UD	UD
Chromium	0.01	UD	0.022
Copper	0.025	**4.330**	**0.143**
Lead	0.005	**0.106**	**0.290**
Mercury	0.0002	UD	0.0003
Nickel	0.04	0.215	0.0122
Zinc	0.02	**2.040**	**0.247**
Silver	0.01	UD	UD
Chromium (Hexavalent)	—	—	UD
VOLATILE ORGANIC COMPOUNDS (mg/l)			
VOCs			
Chloromethane	0.01	0.029B	0.019B
Methylene Chloride	0.005	0.013B	UD
1,1-Dichloroethane	0.005	0.010	UD
1,2-Dichloroethene (Total)	0.005	UD	UD
1,2-Dichloroethane	0.005	UD	UD
1,1,1-Trichloroethane	0.005	UD	UD
Trichloroethene	0.005	UD	UD
Benzene	0.005	0.004J	UD
Tetrachloroethene	0.005	UD	UD
Toluene	0.005	0.027	UD
Chlorobenzene	0.005	UD	UD
1,1-Dichloroethene	0.005	0.015	UD
Ethylbenzene	0.005	**0.064**	UD
Chloroethane	0.01	UD	0.012B
TOTAL VOCs		0.162	0.031
TENTATIVELY IDENTIFIED VOCs**			
Unknowns	(2)	0.330J	0.212J
Butycyclopentane		0.025J	UD
Unknown Nitrile		0.036J	UD
Unknown sub noname		0.034J	UD
2-Propanone		UD	0.045J
3,4-Nonadiene		UD	0.067J
4-Ethyl-3-Heptene		UD	0.007J
3-Ethyl-3-Heptene		UD	0.035J
2-Methyl heptane		UD	0.039J
Methylcycloheptane		UD	0.021J
1,2-Dimethoxyethane		UD	UD
1-(2-Methoxyethoxy) -Butane		UD	UD
3-Methyl-2-Butanone		UD	UD
3-Methyl Pentane		UD	UD
Butanoicacid Methylester		UD	UD
2-Butanone (Methyl -ethyl Ketone)		UD	UD
Hexane		UD	UD
Ethanol		UD	UD
Dimethoxy Methane		UD	UD
Other Unknowns		UD	UD
TOTAL TENTATIVELY IDENTIFIED VOCs		0.425	0.426
TOTAL VOCs		0.587	0.457
BASE NEUTRAL EXTRACTABLES			
Bis(2-Ethylhexyl)phthalate		UD	UD
Di-n-octylphthalate		UD	UD
TOTAL BASE NEUTRAL EXTRACTABLES		UD	UD
TOTAL ACID EXTRACTABLES		UD	UD

* - See Appendix F for laboratory results of trip blanks & field blanks
(1) - See Figure 3.2.2.2 for sampling locations
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of laboratory
CRQL - Contract Required Quantification Limit
** - Carbon dioxide results were not included
— - Not analyzed
Bold - Bold numbers indicate exceedence of GA Standards

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3.2.4 CHEMICAL CHARACTERISTICS OF BIOTA

The Site and surrounding area has been determined to be light industrial and residential. Contacts with DEC Fish and Wildlife, SCDHS, and the USGS have indicated that this area does not provide habitats for wetlands or other sensitive environments.

No biota inventories or sampling data have been obtained for the Site area. This will be investigated as discussed in this RI/FS work plan (Section 5.3.4.8).

3.2.5 CHEMICAL CHARACTERISTICS OF AIR

The present tenant at the Site does not maintain air emissions permits nor have previous tenants. During the sampling effort performed by Fanning, Phillips and Molnar (for the RI in 1988-90), an OVA was utilized on Site as part of the health and safety plan.

Site air monitoring for background conditions indicated total VOCs to range between 0 parts per million (ppm) and 4 ppm throughout the Site. Background air quality did not prohibit on-site activity and was not attributed to any known sources.

The soil sampling data obtained during the preceding RI (References 2 through 5) and the results from the implementation of this RI/FS will be evaluated as outlined in Task 6 (Section 5.0) of this RI/FS work plan.

3.2.6 SUMMARY OF QUALITY ASSURANCE/QUALITY CONTROL, DATA VALIDATION, AND DATA USABILITY

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The laboratory results for six (6) trip and five (5) field blanks are presented in Appendix F. The results indicate detected concentrations of metals and PP VOCs in most blanks including the laboratory method blanks. The concentrations of metals and PP VOCs detected in the blanks are below the quantification levels of the laboratory, in most cases.

The laboratory results for the split soil sample TB-2 (22'-24') are presented in Table 3.2.6.1. The results show that the two (2) laboratories are in close agreement. Out of the nine (9) metals tested, they agree on cadmium, silver and mercury as being undetected. The differences could be explained by the lack of homogeneity in the split soil samples and the

TABLE 3.2.6.1
LABORATORY RESULTS OF SPLIT
SOIL SAMPLING - TB-2 (22' - 24')
H2M AND NYTEST
SJJ SITE, FARMINGDALE, NEW YORK

METALS (mg/kg)	CRQL (mg/kg)	H2M	NYTEST
Arsenic	0.01	UD	1.2
Cadmium	0.005	UD	UD
Chromium	0.01	3.2	6.0
Copper	0.025	1.5B	15.0
Lead	0.005	3.6	UD
Mercury	0.0002	UD	UD
Nickel	0.04	2.6B	14.0
Silver	0.01	UD	UD
Zinc	0.02	5.6	110.0

UD Undetected
B Detected in Method Blank
CRQL Contract Required Quantification Limit

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low concentrations detected.

DATA VALIDATION AND USABILITY ANALYSIS

All data reported for the RI report of May, 1990, was evaluated by the DEC in 1991 through a validation and usability analysis (Reference 26). The CLP Laboratory, H2M Labs, Inc., was provided with all the appropriate information to address the DEC concerns with the reported data. The results of this correspondence are presented in Appendix G. The correspondence and data validation report presents the critical points with respect to compliance with data holding times, detection limits, and quantification values. To follow up on the concerns raised by the DEC validation and usability analysis, a conference call was conducted between the EPA, H2M Labs, Inc., the DEC, and Fanning, Phillips and Molnar on June 18, 1991. See Appendix G for a memorandum of the minutes of the conference call. The objective of the conference call was to speak with the DEC to determine the valid data and subsequent usability. Finally, H2M has presented a response to the data concerns regarding chromium and holding times (see Appendix G).

Table 3.2.6.2 lists the sampling data that were determined valid and, therefore, usable.

3.3 PRELIMINARY IDENTIFICATION OF ARARs and TBCs

3.3.1 POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The National Contingency Plan (NCP) (50 Federal Register 47912, November 20, 1985) and the SARA/CERCLA Compliance Policy guidance define applicable requirements as the federal and state requirements for hazardous substances, which would be legally binding at the site, if site response were to be undertaken regardless of CERCLA Section 104. Relevant and appropriate requirements are defined applicable, apply to facilities or problems similar to those encountered at this site, so that their use is well suited. In other words, requirements may be relevant and appropriate if they would be applicable except for jurisdictional restrictions associated with the requirements. With respect to the selection of remedial alternatives, relevant and appropriate requirements are to be afforded the same

ABI 2.(
VALID AND/OR USABLE DATA
FROM 1990 RI REPORT
SJ&J SITE
FARMINGDALE, NEW YORK

Sample ID# and Depth	Comments	Level of Data Quality Objectives (parameter) Met
Background Samples		
BLCN (0-6") (24"-30")	Valid and usable (all depths)	IV (metals)(1)
Former Solvent Drum Storage Area		
TB-1 (4'-6') (8'-10') (18'-20') (22'-24')	Resample for VOCs or obtain QR* from H2M	IV (pending H2M QR)
Along Pipeline		
HB-11 (0-6") HB-12 (6"12") HB-13 (6"-12") HB-14 (6"-12") HB-15 (0-6") HB-16 (6"-12") HB-17 (6"-12")	Valid and usable (all depths)	IV (metals)
Test Boring in Leaching Pit		
TB-2 (10'-12') (12'-14') (14'-16') (16'-18') (18'-20') (20'-22') (22'-24') (24'-26') (26'-28')	Valid and usable (all depths)	IV (metals for all depths; Full PP list for 16'-18'; and VOCs(2) for 24'-26')
Leaching Pit		
HB-18 (0-6") (30"-36") HB-19 (0-6") (30"-36") (54"-60") HB-20 (0-6") (2.5'-3') (60'-66') HB-21 (0-6") (30-36") (5'-5.5')	Valid and usable (all depths)	IV (metals)
Outside Sludge Drying Beds		
HB-5 (0-6") (2'-2.5') HB-6 (0-6") (2'-2.5') HB-9 (3'-3.5')	Valid and usable (all depths)	IV (metals)
Steam Cooker Area		
HB-10 (6"-12") (at 18")	Valid and usable (both depths)	IV (metals)
Beneath Sludge Drying Beds		
HB-1 (0-6") (6"-12") HB-2 (0-6") (6"-12") HB-3 (0-6") (6"-12") HB-4 (0-6") (6"-12") HB-7 (0-6") (2.5'-3') HB-8 (0-6") (2.5'-3')	Valid and usable (all depths)	IV (metals for all samples and depths; VOCs for HB-1 (0-6"); Full PP list except VOCs for HB-3 (6"-12"); VOCs for HB-4 (6"-12"); VOCs for HB-7 (0-6"); and VOCs for HB-8 (0-6").
Well Borings		
MW-1 (20'-22') MW-4 (15'-17')	Valid and usable (both samples)	IV (VOCs)
Leaching Pools		
LP-1 (0-6") LP-2 (0-6") LP-3 (0-6")	Valid and usable metals for all three, need VOCs	IV (metals)
Groundwater Monitoring Wells		
MW-1 Aqueous MW-2 Aqueous MW-3 Aqueous MW-4 Aqueous MW-5 Aqueous	Valid and usable aqueous metals for all five wells, need VOCs	IV (metals)

* QR indicates Quantification Report
(1) Metals indicate: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag and Zn
(2) VOCs indicate: Priority Pollutant Volatile Organic Compounds

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weight and consideration as applicable requirements.

The following federal and state regulatory requirements are potentially applicable or relevant and appropriate to the site:

1) Contaminant-Specific

Federal:

- o Resource Conservation and Recovery Act (RCRA) Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)
- o Clean Water Act, Water Quality Criteria (Section 304) (May 1, 1987 - Gold Book)
- o National Ambient Air Quality Criteria (NAAQS) (40 CFR 50)
- o Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) 40 CFR 141.11 - .16)

New York State

- o New York Groundwater Quality Standards (6 NYCRR 703)
- o New York Safe Drinking Water Act Maximum Contaminant Levels (MCLs) 10 NYCRR 5)
- o New York Surface Water Quality Standards (6 NYCRR 702)
- o New York State Raw Water Quality Standards (10 NYCRR 170.4)
- o New York RCRA Groundwater Protection Standards (6 NYCRR 373-2 6(e))
- o New York Ambient Air Quality Standards (6NYCRR 256 and 257)

2) Location-Specific

Federal

- o Executive Orders on Floodplain Management and Wetlands Protection (CERCLA Floodplain and Wetlands Assessments) #11988 and 11990
- o National Historic Preservation Act (16 USC 470) Section 106 et seq. (36 CFR 800)
- o RCRA Location Requirements for 100-year Floodplains (40 CFR 264.18(b)).
- o Wetlands Construction and Management Procedures (40 CFR 6, Appendix A)

New York State

- o New York State Freshwater Wetlands Law (ECL Article 24, 71 in Title 23)

- o New York State Freshwater Wetlands Permit Requirements and Classification (6 NYCRR 663 and 664)

- o New York State Floodplain Management Act and Regulations (ECL Article 36 and 6 NYCRR 500)

- o New York State Flood Hazard Area Construction Standard.

3) Action-Specific

Federal

- o RCRA Subtitle C Hazardous Waste Treatment Facility Design and Operating Standards for Treatment and Disposal Systems, (i.e., landfill, incinerators, tanks, containers, etc.) (40 CFR 264 and 265) (Minimum Technology Requirements)

- o RCRA Subtitle C Closure and Post-Closure Standards (40 CFR 264, Subpart G)

- o RCRA Groundwater Monitoring and Protection Standards (40 CFR 264, Subpart F)

- o RCRA Generator Requirements for Manifesting Waste for Off-site Disposal (40 CFR 263)

- o RCRA Subtitle D Nonhazardous Waste Management Standards (40 CFR 257)

- o RCRA Transporter Requirements for Off-Site Disposal (40 CFR 270)

- o Safe Drinking Water Act, Underground Injection Control Requirements (40 CFR 144 and 146)

- o RCRA Land Disposal Restrictions (40 CFR 268) (On-and Off-site disposal of excavated soil)

- o Clean Water Act - NPDES Permitting Requirements for Discharge of Treatment System Effluent (40 CFR 122-125)

- o Effluent Guidelines for Organic Chemicals, Plastics and Resins (Discharge limits) (40 CFR 414)

- o Clean Water Act Discharge to Publicly - Owned Treatment Works (POTW) (40 CFR 403)

- o National Emission Standards for Hazardous Air Pollutants (NESHAPSs) (40 CFR 61)

- o DOT Rules for Hazardous Materials Transport (49 CFR 107, 171.1-171.500)

- o Occupational Safety and Health Standards for Hazardous Responses and General Construction Activities (29 CFR 1904, 1910, 1926)

New York State

- o New York State Pollution Discharge Elimination Systems (SPDES) Requirements

(Standards for Storm Water Runoff, Surface Water, and Groundwater discharges) (6 NYCRR 750-757)

- o New York State RCRA Standards for the Design and Operation of Hazardous Waste Treatment Facilities (i.e., landfills, incinerators, tanks, containers, etc.). Minimum Technology Requirements (6 NYCRR 370-372)

- o New York State RCRA Closure and Post-Closure Standards (Clean Closure and Waste-in-Place Closures) (6 NYCRR 372)

- o New York State Solid Waste Management Requirements and Siting Restrictions (6 NYCRR 360-361)

- o New York State RCRA Generator and Transporter Requirements for Manifesting Waste for Off-Site Disposal (6 NYCRR 364 and 372)

- o New York State Air Emission Requirements (VOC Emission from Air Strippers and Process Vents, General Air Quality) (6 NYCRR 200-212)

3.3.2 POTENTIAL "TO BE CONSIDERED" MATERIAL

When ARARs do not exist for a particular chemical or remedial activity or when the existing ARARs are not protective of human health or the environment, other criteria, advisories and guidance may be useful in designing and selecting a remedial guidance may be useful in designing and selecting a remedial alternative. The following criteria, advisories and guidance were developed by the EPA and other federal and state agencies.

1) Federal

- o Safe Drinking Water Act National Primary Drinking Water Regulations, Maximum Contaminant Level Goals (MCLGs)

- o Proposed Maximum Contaminant Levels (50 Federal Register 46936-47022, November 13, 1985)

- o Proposed Federal Air Emission Standards for Volatile Organic Control Equipment (52 Federal Register 3748)

- o Proposed Requirements for Hybrid Structures (combined waste-in-place and clean closures) (52 Federal Register 8711)

- o USEPA Drinking Water Health Advisories

- o USEPA Health Effects Assessment (HEAs)

- o TSCA Health Data

- o Toxicological Profiles, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service

- o Policy for the Development of Water-Quality-Based Permit Limitations for Toxic Pollutants (49 Federal Register 9016)
- o Cancer Assessment Group (National Academy of Science) Guidance
- o Groundwater Classification Guidelines
- o Groundwater Protection Strategy
- o Waste Load Allocation Procedures
- o Fish and Wildlife Coordination Act Advisories
- o Federal Guidelines for Specification of Disposal Site for Dredged or Fill Material.

New York State

- o New York State Proposed Safe Drinking Water Standards Maximum Contaminant Levels for VOCs (10 NYCRR 5)
- o New York State Underground Injection/Recirculation at Groundwater Remediation Sites (Technical Operating Guidance (TOG) Series 7.1.2)
- o New York State Analytical Detectability for Toxic Pollutants (85-W-40 TOG)
- o New York State Toxicity Testing for the SPDES Permit Program (TOG 1.3.2)
- o New York State Regional Authorization for Temporary Discharges (TOG Series 1.6.1)
- o New York State Air Guidelines for the Control of Toxic Ambient Air Contaminants (Air Guide 1)

3.4 POTENTIAL PATHWAYS OF CONTAMINATION AND PRELIMINARY PUBLIC HEALTH AND ENVIRONMENTAL IMPACTS

POTENTIAL PATHWAYS OF CONTAMINATION

As the preceding sections show, a significant amount of soil and groundwater sampling and analysis have been previously performed at the Site. The chemical compounds known to be present in the soils and groundwater have been identified by the previous sampling and analysis effort. Therefore, the potential pathways of contamination can be assessed.

The alleged portion of the Site affected is the former wastewater treatment and discharge area. In general, metals and VOCs are known to be present in the vadose zone soils in this area. The potential pathway of contamination by metals present is downward movement through the vadose zone as a solute, due to recharge water from rain. Metals in solution which reach the groundwater will move, with the groundwater, in the direction of groundwater flow.

The pathway of overland runoff of metals as solutes after rain events has been determined to be insignificant due to pavement on the Site and the high soil permeability (and the lack of significant topographic gradients in the Site area).

VOCs may enter the groundwater from the vadose zone in the same manner as metals. VOCs may also be present in a gaseous state and migrate within the vadose zone or off-gas into the atmosphere or building. However, since VOCs are not known to have been discharged since 1986, and since an OVA headspace analysis was performed in the soils at over 50 locations throughout the Site, significant quantities of off-gassing VOCs are highly unlikely.

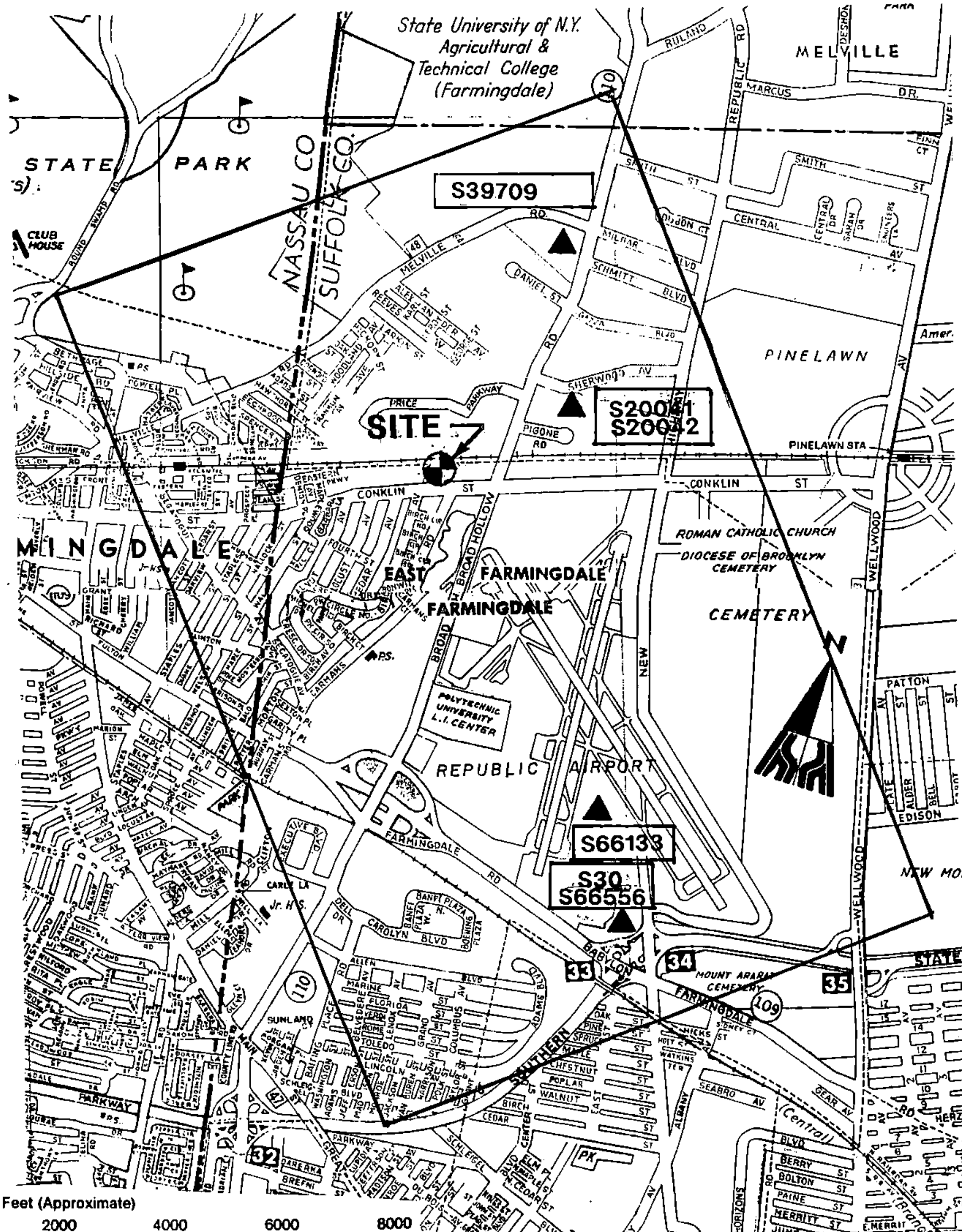
Metals and VOCs which exist in the groundwater will travel generally in a south-southeast direction at a velocity equal to or less than the groundwater pore velocity, which has been estimated to be 0.53 feet per day.

A more detailed investigation of the potential pathways of contamination will be performed in the RI risk assessment.

PRELIMINARY PUBLIC HEALTH AND ENVIRONMENTAL IMPACTS

The preliminary public health and environmental impacts are expected to be minimal. Observation well analysis data was obtained for SCDHS wells within one mile upgradient and cross gradient and two miles downgradient of the Site in order to obtain off-site groundwater quality. The locations of the wells are presented in Figure 3.4.1.

Analysis results from the SCDHS wells for select VOCs, petroleum related compounds, and metals were obtained. The detections and well details are presented in Appendix H. The highest VOC contamination occurred in well S-66133 which is located approximately one-half mile downgradient of the Site. However, it has been learned that a groundwater investigation has been undertaken at Fairchild Republic concerning solvent contamination in the



Scale in Feet (Approximate)

0 2000 4000 6000 8000

1 Mile

NOTE: AREA OF INVESTIGATION IS ONE MILE UP & CROSS GRADIENT & TWO MILES DOWN GRADIENT

▲ — SCDHS OBSERVATION WELL LOCATION

F,P&M

FIGURE 3.4.1 – LOCATION OF SCDHS OBSERVATION WELLS IN THE VICINITY OF THE SITE

groundwater [personal communication with Sy Robbins, SCDHS (Reference 35)]. Therefore, the results obtained from samples taken from this well are unreliable as an indicator of contaminant migration from the Kenmark Textile site. In addition, wells S-66556 and S-30 are further downgradient of well S-66133 and are also not representative of water quality downgradient of the Kenmark Textile Site.

Public health concerns for this Site are primarily due to concerns related to drinking water which may contain unacceptable levels of VOCs and metals. However, the nearest public supply well to the Site in the downgradient direction exists approximately 2.5 miles southeast (Great Neck Road, North Amityville, refer to Appendix H). Available VOC results for the period from 1977 to 1987 indicate that no VOCs have been detected at this well field. Based on the SCDHS analysis results, VOCs in the groundwater at the Site have not affected public water supplies at the present time.

A more detailed investigation of public health and environmental impacts will be performed in the RI risk assessment.

3.5 PRELIMINARY IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES

3.5.1 ADDITIONAL DATA NEEDS

Based upon the data validation and data usability analyses of the previous sampling results, additional data needs have been identified in order to achieve the data quality objectives (DQOs) to perform a risk assessment for this site (DQO Level IV). The following data needs for the previous sampling data are noted:

- o Test Boring #1: it was indicated that H2M Labs, Inc. will provide a quantification report (QR) in order to provide quantitative values for 2-propanone (acetone) and xylene. The QR will provide acceptable data in order to achieve a higher DQO (Level IV).
- o Well #3 (25'-27'): TCL VOC analysis was initially insufficient, however, a QR for these data will be obtained.

- o Leaching Pools: in the vicinity of the sludge drum storage area the leaching pools should be resampled for TCL VOCs.
- o MW-1 through MW-5: these wells should be resampled for TCL VOCs.

Section 5.3.5 of the RI/FS work plan will provide the proposed sampling plan locations.

3.5.2 PRELIMINARY IDENTIFICATION OF REMEDIAL ACTIONS AND ALTERNATIVES

Preliminary evaluation of the exposure routes for concentrations of As, Cu, Cd, Ag and Zn in the soils at the Site indicate that there is no significant concern for dust control. The following remedial actions are listed here for alternatives:

1. No Action: i.e., groundwater monitoring.
2. Removal: excavate soils at areas of concern. This will remove the source. On-site/off-site disposal.
3. Containment: encapsulate soils via pavement (asphalt parking lot, other) in order to eliminate direct exposure to soils containing levels of Cu, As, Ag, Cd, and Zn. This will also minimize migration of these parameters into the groundwater.
4. On-site Treatment:

   o Soil washing
   o Chemical fixation
   o In situ Treatment
      - soil flushing
      - vitrification
      - fixation

The groundwater data developed up to the present time is insufficient to make a preliminary identification of remedial actions and alternatives for groundwater.

SECTION 4.0
WORK PLAN RATIONALE

4.1 DATA QUALITY OBJECTIVE (DQO) NEEDS

The DQOs for the RI/FS will be applicable for all data collection activities at the Site. DQOs will be incorporated into the Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP). All data collection activities for this project are anticipated to occur during the RI portion of the study.

The primary data users for this project will be the Fanning, Phillips and Molnar and the EPA's remedial project managers. No secondary data users are contemplated at this time.

The available data for the Site was presented previously in Section 3.0, along with an evaluation of potential pathways. A discussion of the data validation and usability have also been presented.

Data to be collected during the implementation of the SAP will characterize the nature and extent of contamination. This will allow for the preparation of the risk assessment (by EPA), the RI report, Treatability Study (if necessary), and the Feasibility Study report.

For this project, it is anticipated that Level I (screening) will be used during any soil sampling or groundwater monitoring well installation and sampling. Level I includes field monitoring for total volatile organic vapor concentrations. Level I field monitoring for total volatile organic compounds (excluding methane) will be performed by using a Photovac MicroTIP (photoionization detector - PID or a Century 128 OVA). The field monitoring results will be utilized for determining which soil samples are to be laboratory tested for VOCs as per Level IV DQO. All other samples will be tested for metals as per Level IV DQOs. Laboratory methods for inorganics will be AA or ICP and methods for organics will be GC/MS in order to achieve low detection limits (ppb).

The analytical data to be obtained for this project will be analyzed by the laboratory to conform to analytical Level IV. The data use will be for risk assessment, Site characterization, evaluation of alternatives, and engineering design.

4.2 WORK PLAN APPROACH

The work plan approach is to present previous Site data and evaluate the existing laboratory data, as appropriate for the respective DQOs. This information will be incorporated into the tasks necessary for completion of the RI/FS. DQOs will be incorporated into the Sampling and Analysis Plan (SAP) and elsewhere, as necessary. The Site area of concern will be increased both south and east as per EPA requirements.

Data previously collected and determined valid and usable will be supplemented by additional sampling and analyses. Table 3.2.6.2 presents applicable data which has been determined valid and usable for this RI/FS.

The purpose of the remedial investigation is to determine areal and vertical extent of soil and groundwater contamination at the site.

Based upon the findings of this RI, remedial alternatives will be presented and the most feasible alternative(s) of remediation will be utilized. Mitigation and elimination of any present or potential threat to human health or the environmental as per the requirements of the AOC for a RI/FS will be completed.

Fanning, Phillips and Molnar will provide details of the SAP to obtain data which satisfy the project DQOs (Level IV). The SAP will provide for the implementation of the EPA-approved work plan and will consist of a Field Sampling Plan and a Quality Assurance Project Plan (QAPP). A Health and Safety Plan (HSP) will also be submitted.

The QAPP will describe the policies, organization, functional activities, and QA/QC protocols necessary to achieve DQOs dictated by the intended use of the data. The SAP will provide guidance for all field work by defining, in detail, the sampling and data-gathering methods to be used for the project.

The SAP will include:

a) site background;

b) sampling objectives;

c) sampling locations and frequencies, including a map depicting sampling locations, and the rationale for each location;

d) sampling designation;

e) sampling equipment and procedures; and

f) sampling handling and analysis.

The QAPP will include:

a) project description;

b) project organization and responsibilities, including resumes of key personnel;

c) quality assurance objectives for measurement;

d) sampling procedures;

e) sampling custody;

f) calibration procedures;

g) analytical procedures;

h) data reduction, validation and reporting;

i) internal quality control;

j) performance and systems audits;

k) preventative maintenance;

l) data assessment procedures;

m) corrective actions; and

n) quality assurance reports.

All plans: SAP (FSP and QAPP) and HSP will be prepared in accordance with all documents specified in the AOC.

SECTION 5.0
REMEDIAL INVESTIGATION/FEASIBILITY STUDY TASKS

The tasks for the RI/FS presented below correspond to the tasks presented in the "Intereim Final Guidance for Conducting RI/FS under CERCLA" (OSWER Directive 9355.3-01 October 1988) Reference 6. Nine (9) of these tasks are considered part of the RI, and four (4) part of the FS. One task is reserved for post-RI/FS support. The last taks is reserved for miscellaneous work. The order in which these tasks are presented is the general order in which the tasks will be performed. Some tasks, such as community relations, will be implemented throughout the duration of the RI/FS by the USEPA.

5.1 TASK 1 - PROJECT PLANNING

The project planning task involves several subtasks that must be performed in order to develop the plans and corresponding schedule necessary to execute the RI/FS (see Plate 5.1.1 for schedule). These subtasks include performing a detailed analysis of existing data, reviewing existing project plans, making Site visit(s), developing a preliminary risk assessment, identifying preliminary remedial alternatives, determining and identifying DQOs, determining ARARs, and holding a work plan review meeting with EPA and other interested agencies. All of these activities culminate in the preparation of the final project plans.

The project plans include the preparation of this detailed work plan. The work plan includes the kickoff meeting and Site visit.

The SAP will provide detailed procedures for each field activity. Specifically, the SAP will address:

- o Standard Operating Procedures (SOPs) for field investigations including sampling, monitoring, and field instrument calibration.
- o Number, location and types of samples.
- o Analyses to be performed on each sample.
- o Chain-of-custody procedures.
- o Sample packaging and shipment procedures.

- o Decontamination procedures.
- o QA/QC of field sampling and procedures for field changes and corrective action.
- o Responsibilities of site personnel.
- o Parameters to be analyzed and analytical methods.

QA/QC protocol will be prepared in accordance with EPA Region II guidelines and Section 10 of the EPA publication entitled Test Methods for Evaluating Solid Waste (SW-846), using the "Brossman Short Form" or more recent form. The form requires information such as sample quality objectives, detection limits, preservation techniques, laboratory testing protocols, and laboratory accuracy and precision goals.

The form also requests information on data validation. All chemical data generated by laboratories for Fanning, Phillips and Molnar will be validated by a sub-contractor using EPA's Contract Laboratory Program SOP.

The SAP has been discussed in Section 4.2.

The HSP includes the following site-specific information:

- o hazard assessment;
- o training requirements;
- o monitoring procedures for site operations;
- o safety procedures;
- o disposal and decontamination procedures; and
- o other sections required by EPA.

The HSP will also include a contingency plan that addresses site-specific conditions that may be encountered.

Plate 5.1.1 presents the schedule for this RI/FS work plan. This schedule has been prepared in accordance with EPA AOC.

5.2 TASK 2 - COMMUNITY RELATIONS PLAN

The EPA will prepare a community relations plan. Fanning, Phillips and Molnar shall provide information, as requested by the EPA, supporting EPA's community relations programs as requested by the EPA. Fanning, Phillips and Molnar shall participate in the preparation of all appropriate information disseminated to the public and in public meetings which may be held or sponsored by EPA to explain activities at or concerning the Site.

5.3 TASK 3 - FIELD INVESTIGATIONS

This task includes all activities related to implementing field investigations at the project Site.

5.3.1 OVERALL OBJECTIVE

The objective of this RI/FS work plan is to determine the areal and vertical extent of soil and groundwater contamination at the site.

Based upon the findings of this RI, remedial alternatives will be presented and the most feasible alternative(s) of remediation will be utilized. Mitigation and elimination of any present or potential threat to human health or the environment as per the requirements of the AOC for the RI/FS will be completed.

5.3.2 SUBCONTRACTING

This subtask will include procurement of the sub-contractors to perform field investigation activities. To support the proposed field activities, the following subcontractors may be required:

o The drilling sub-contractors under consideration are:

Fenley & Nicol Co., Inc.
445 Brook Avenue
Deer Park, New York 11729
(516) 586-4900
Contact: Walter Berninger

Aquifer Drilling & Testing
10-12 46th Road
Long Island City, New York 11101
(718) 361-9757
Contact: Lenny Rexrode

Tyree Brothers
208 Rte. 109
Farmingdale, New York 11735
(516) 249-3150
Contact: Steve Tyree

These drilling companies have worked with Fanning, Phillips and Molnar in the past and have stated that their on-site drilling personnel have completed 40-hour OSHA training and 8-hour yearly refresher courses.

- Laboratories for the sample analysis under consideration are:

  H2M Laboratories, Inc.
  575 Broadhollow Road
  Melville, New York 11747-5076
  (516) 694-3040
  Contact: Vincent Stancampiano

  NYTest Environmental, Inc.
  60 Seaview Boulevard
  Port Washington, New York 11050
  (516) 625-5500
  Contact: John Gaspari

  IEA Labs, Inc.
  200 Monroe Turnpike
  Monroe, Connecticut 06468
  (203) 261-4458
  Contact: Kathy Rasbach

  Tyree Laboratories, Inc.
  208 Rte. 109
  Farmingdale, New York 11735
  (516) 249-1456
  Contact: Dan Spandau

- Laboratory data validators under consideration include:

  H2M Laboratories, Inc.
  575 Broadhollow Road
  Melville, New York 11747-5076
  (516) 694-3040
  Contact: Vincent Stancampiano

  NYTest Environmental, Inc.
  60 Seaview Boulevard
  Port Washington, New York 11050
  (516) 625-5500
  Contact: John Gaspari

Advanced Technologies and Laboratories International, Inc.
476 Roseville Avenue, #30
Newark, New Jersey 07107
Contact: Regina Sullivan

Data Validation Services
P.O. Box 54
Riparius, New York 12862
(518) 494-3509
Contact: Judy Harry

Environmental Standards, Inc.
The Commons at Valley Forge, Unit 4
1220 Valley Forge Road
P.O. Box 911
Valley Forge, Pennsylvania 19481
(215) 935-5577
Contact: Rock J. Vitale

The data validation for the Site work will be performed by a EPA-approved data validator.

o Surveying services will be provided by the following NYS Licensed Surveyor:

Tyson Surveyors
11 Avery Lane
Plainview, New York 11803
(516)
Contact: Harry Tyson

5.3.3 MOBILIZATION AND DEMOBILIZATION

This subtask will consist of field personnel orientation, equipment mobilization, the staking of sampling locations and demobilization. Each field team member will attend an on-Site orientation meeting to become familiar with the history of the Site, health and safety requirements, and field procedures.

Equipment mobilization will entail the ordering, purchase, and if necessary, fabrication of all sampling equipment needed for the field investigation. A complete inventory of available equipment will be conducted prior to initiating field activities. Any additional equipment required will be secured.

Locations for the surface soil samples, soil borings and groundwater monitoring wells will be staked at the start of the Site operations. These locations will be measured from existing landmarks and provisions will be made to accommodate plant activities currently in progress.

Equipment will be demobilized at the completion of each phase of field activities as necessary. Equipment demobilization may include (but will not be limited to) sampling equipment, drilling sub-contractor equipment, health and safety decontamination equipment, and utility hookups.

5.3.4 PHYSICAL CHARACTERISTICS SURVEY

5.3.4.1 SURFACE AND SUBSURFACE FEATURES INVESTIGATION

To the extent that existing Site data do not fully characterize the surface features at the Site, a surface features investigation will be performed. Particular attention will be given to features that identify possible sources and routes of contaminant migration and the location of potentially affected receptors such as buildings, underground storage tanks, and other structures. The investigation will also include determining if the manhole covers identified during previous site work are leaching pools. If these are leaching pools, Fanning, Phillips and Molnar will sample the sediment following the same methods as presented in Section 5.3.5.4. The previously-sampled leaching pools will be investigated for the existence of influent pipes. If any such pipes are identified, an investigation of the drainage from the building will performed. This will include examining floor plans and, if necessary, performing a dye-tracer test.

The investigation will extend to off-site areas. Surface features will be described and located on a map. The base map will be used to locate well locations, determine contaminant distribution and characterize the Site gradient, among other information.

5.3.4.2 GEOLOGICAL SURVEY

The purpose of a geological survey is to determine the characteristics of the underlying media which may act as a pathway of contaminants into the aquifer(s) and water supplies of the Site area. Extensive geological information has been obtained and is presented in Section

3.0 of this RI/FS work plan.

All subsurface information obtained during this RI/FS will supplement the existing data for a more comprehensive characterization of the Site. Geologic information will be collected by use of split-spoon soil sampling and described using applicable Unified Soil Classification System (USCS) methods (Appendix J). Geologic information may also be applicable to the remedial design phase of the FS. Information such as grain size, color, roundness, and mineralogy will be reported for soil samples. A geologic cross-section will be developed using the data from existing and new wells.

Down hole natural gamma logging will be performed on the proposed deep groundwater monitoring well at the Site in order to obtain supplemental information from boring logs during drilling.

5.3.4.3 SOILS AND VADOSE ZONE INVESTIGATION

The purpose of the soils and vadose zone investigation is to determine the characteristics of the underlying media which may act as both a source and pathway of contaminants into the aquifer(s). Existing information has been obtained and presented in Section 3.0 of this RI/FS work plan. All soils and vadose zone information obtained during this RI/FS will supplement existing data for a more comprehensive characterization of the Site.

Soils and vadose zone information will be collected by use of split-spoon samplers, the samples will be described using applicable USCS methods (Appendix J) and select samples analyzed by an EPA CLP laboratory in order to achieve DQOs (see subsection 5.3.5.3 for details of soil sampling and analyses). In addition, two (2) percolation tests will be performed on the vadose zone in order to determine the soil permeability and infiltration rate. Information obtained from soil sampling in the vadose zone may be utilized in the remedial design phase of the FS. Supplemental information may be proposed (as necessary) for the FS (i.e., soil moisture content, adsorption coefficients, etc.).

5.3.4.4 SURFACE WATER HYDROLOGY INVESTIGATION

The purpose of the surface water hydrology investigation is to determine the drainage and erosional patterns and surface water bodies such as ditches, streams, ponds, and lakes in the vicinity of the site. This is critical for the determination of potential transport of contaminants via runoff with respect to receptors.

For this RI/FS, a Site topographic survey will be performed by a NYS licensed surveyor in order to determine specific drainage patterns. Based upon this information, surface water runoff will be investigated to determine the fate. Drainage plans will be obtained from the SCDPW and Town of Babylon Sewer and Drainage Departments to determine the piping network.

In addition, the nearest surface water body has been identified as a recharge basin near Fairchild Republic (west of Rt. 110). This recharge basin was formerly mined for sand and gravel. After the mining operation, Fairchild Republic (a NYSDEC Superfund site) and the NYS Department of Transportation (NYSDOT) each owned approximately half of the 13± acre basin area. The NYSDOT subsequently deeded their portion of the basin to Fairchild Republic with the condition that ownership would revert to NYS once the airport stopped use. The recharge basin at that time was allegedly used for industrial wastewater discharge. In the 1980s, Fairchild Republic ceased discharges to the basin. The basin is presently under a NYS DEC Superfund Investigation which is being conducted by Fairchild Republic. Fanning, Phillips and Molnar does not propose an investigation of this recharge basin at the present time as this would be a duplication of effort.

Any additional surface water bodies (receptors) identified (within a half mile downgradient of the Site) from the topographic survey and drainage study will be investigated, as necessary.

5.3.4.5 HYDROGEOLOGIC INVESTIGATION

The purpose of the hydrogeologic investigation is to determine the Site hydrogeologic characteristics with respect to groundwater flow direction, velocity, and usage. Previous hydrogeologic information has been presented in Section 3.0 of the RI/FS work plan. Based upon previous investigations, groundwater has been determined to flow approximately 0.53 ft/d in a south-southeast direction beneath the Site. This information has been obtained from five (5) groundwater monitoring wells and soils analysis for hydraulic conductivity utilizing the Moretrench American Corporation Method (Reference 25, pg. 737-738).

Fanning, Phillips and Molnar proposes to install five additional groundwater monitoring wells in this RI/FS work plan. Two shallow wells are proposed upgradient of the Site and three downgradient on the Site (one downgradient well will be deep and two will be shallow). The locations of these wells is presented in Section 5.3.5.1 of this work plan. **(NOTE: AS OF NOVEMBER 1, 1991, MW-1, MW-2, MW-3, MW-4 AND MW-5 DESIGNATIONS WERE CHANGED TO SW-1, SW-2, SW-3, SW-4 AND SW-5, RESPECTIVELY TO ALLOW DISTINCTION BETWEEN SHALLOW WELLS AND THE PROPOSED DEEP WELL).**

The deep well will be investigated by measuring water levels in comparison to the adjacent (and existing) shallow well SW-6. Differences in the head measurements will be used to assist in the interpretion of the vertical component (gradient) of the groundwater flow system beneath the Site. The results will provide information to confirm that the Site is located over a deep groundwater recharge zone. The exact location of these wells will be chosen based on the groundwater flow direction which will be re-determined prior to the installation of the wells. USEPA approval will precede the installation of the downgradient wells. Fanning, Phillips and Molnar will report the results of the groundwater flow direction investigation and proposed locations for the downgradient wells by February 10, 1992.

In addition, a data logger will be utilized on monitoring well SW-1 to determine if private well pumpage (if any exists) is influencing the groundwater elevations at the site. The data logger will be utilized for one week (with a 30 minute data interval minimum) and the data will be evaluated with consideration to precipitation, infiltration, and pumpage rates.

All wells will be tested for hydraulic conductivity by a slug test. The slug tests will provide data for determining hydraulic conductivity (K) estimates for the screened interval of the aquifer. The slug test will be performed by plugging a decontaminated, five-foot section of PVC (water-filled and capped at both ends) in the wells. Measurements of water level change will be recorded with a Telog 2109 data recorder (with a one-second interval data capacity) and Druck pressure transducer. The slug will be decontaminated, then introduced into the well and the water level will be given sufficient time to recover to static conditions. Once this is recorded, the slug will be quickly and smoothly removed from the well and the rising head rate of recovery will be recorded. The results will be graphed and K values calculated using the Bouwer and Rice method of analysis (References 36 and 37). Hydraulic conductivities will be used to calculate groundwater flow velocity and aquifer yield (for potential groundwater recovery systems in FS).

Each groundwater monitoring well will be surveyed to a horizontal and vertical datum (true U.S. Coast and Geodetic Survey Datum). The survey will be performed by a NYS Licensed Surveyor.

Depth to water in each of the wells (along with date and time) will be measured using a decontaminated audio-signal water level indicator (accurate to 0.01 ft.). Well measurements for each round will be collected at a minimum of 6 different times (daily and seasonal) and the elevation of the groundwater surface will then be calculated for contouring. The measurements will be obtained on the same day and over the shortest possible period of time. Groundwater contour maps will be constructed to illustrate the horizontal (2-dimensional) groundwater flow direction and gradient beneath the Site.

In addition, wells S-1, S-7000, S-7001, S-7002, and S-7012 which are reported to exist, or have existed in the past at the site, will be investigated to determine the condition and existence. The results will be reported to the USEPA to determine the viability of obtaining groundwater samples and taking groundwater elevation measurements. This well investigation will take place prior to installation of the proposed wells and the results reported to the USEPA on or prior to February 10, 1992.

5.3.4.6 METEOROLOGICAL INVESTIGATION

The purpose of the meteorological investigation is to characterize the potential for atmospheric transport of contaminants for risk assessment determinations.

Fanning, Phillips and Molnar proposes to investigate the atmospheric conditions during all field work on Site. This will be performed by obtaining daily records of barometric pressure, relative humidity, wind velocity and direction, temperature, and ambient air quality measurements (for total volatile organic vapors). One set of data for each of these parameters will be collected during each day of field activity (estimated 2-3 weeks). In addition, four particulate dust samples will be obtained during on-site work. Dust samples will be collected using an air pump and filter apparatus, as appropriate. Dust particles will be analyzed for targeted parameters (metals). This information will be applicable in the risk assessment portion of the RI.

The data for temperature, relative humidity, barometric pressure, and wind velocity will be obtained by use of a Solomat 500e. A Photovac MicroTIP or Foxboro organic vapor analyzer Model OVA-128 will be utilized to monitor for total volatile organic vapors. A Gilian pump and filter paper will be used to collect particulate dust samples for laboratory analysis.

In addition, field conditions will be recorded each day by the on-site hydrogeologist or engineer and documented in field notebooks (daily logs). Information regarding precipitation, storms, floods, and winds will be documented in the daily logs and confirmed with the Nation Climate Center (NCC), the National Oceanic and Atmospheric Administration (NOAA), or local climate centers.

The results of this investigation will provide the meteorological basis to determine whether a risk assessment is warranted for the atmosphere.

5.3.4.7 HUMAN POPULATIONS AND LAND USE INVESTIGATIONS

The purpose of the human populations and land use investigations are to determine population and demographics. Much of this information has been presented in Section 3.0 of this RI/FS work plan. However, Fanning, Phillips and Molnar proposes to obtain the most current census data from the Long Island Regional Planning Board which recently completed a study for the "Comprehensive Groundwater Management Plan" (Reference 38). In addition, local Town Planning and Zoning Boards will also be contacted for information regarding land use and potentially sensitive populations.

A field survey will be performed, where possible to confirm file information. All data obtained from this investigation will be further evaluated to determine the drinking water suppliers, wells, water intakes, and water distribution. The previous well survey will be updated during this RI/FS to include locating downgradient domestic and industrial wells within one-half mile of the site. As part of this survey, information will be obtained from the SCDHS and, if necessary, a physical survey will be conducted.

5.3.4.8 ECOLOGICAL INVESTIGATION

The purpose of the ecological investigation is to determine if the terrestrial, aquatic or other ecosystems in the Site area could potentially be impacted from a potential release. Fanning, Phillips and Molnar proposes to investigate the ecological setting and potential for impacts in this RI/FS. The investigation will be performed to determine: potential human exposure through agricultural land use (hunting and fishing not applicable); ecosystem components and characteristics; critical habitats; and biocontamination. This investigation will be performed by use of aerial photograph analysis, water resource reports, records of area plants, animal surveys, and existing records of the Site environment. Contacts will be made with the USGS, DEC, SCDHS, and local agencies. A cover type map will be developed for the site and area within 0.5 miles from the perimeter of the site. The cover type map will be generated in accordance with Reference 25 guidelines. In the event that a sensitive environment is identified as a potential receptor of contamination from the Site, a qualified ecologist will be contracted to perform an investigation, as appropriate.

5.3.5 CHEMICAL CHARACTERISTICS SURVEY

Previous studies and information presented have indicated that past land use and alleged discharges at the Site consisted primarily of dissolved metals (copper, arsenic, silver, cadmium, zinc, and chromium). However, the 1990 Fanning, Phillips and Molnar RI report presented data for the sediment sampling within the 3 leaching pools which indicated the presence of VOCs. The leaching pools have been the only potential sources identified with VOCs on the Site. An investigation of the leaching pools will be performed to determine area of drainage accepted, existence of inlet pipes, etc. This section of the RI/FS work plan will present the proposed sampling locations, sampling rationale, and methodology. A more detailed description of the sampling procedures and methods will be presented in the SAP .

This section of the report will present the description of the installation of the proposed monitoring wells, groundwater sampling, soil sampling, soil borings, sediment sampling, and air sampling. The lack of VOCs used in the past processes at the plant indicates that a soil gas survey is not warranted at this time. However, select soil borings and soil samples will be screened with an organic vapor analyzer as will be discussed in the soil sampling/soil boring sub-section of this work plan. Tables 5.3.5.1, 5.3.5.2, and 5.3.5.3 summarize the proposed field investigation, sampling and analysis, and sample numbering for this RI/FS, respectively.

5.3.5.1 INSTALLATION OF MONITORING WELLS
PURPOSE

The laboratory results from monitoring wells SW-3 and SW-4 reveal that concentrations of lead and VOCs exceed the State GA standards. The upgradient well (SW-5) was detected with the highest zinc concentrations. In addition, groundwater samples SW-2, SW-3, SW-4, and upgradient well SW-5 were detected with concentrations of VOCs. However, based upon the data validation and usability analysis by the DEC, these data are not considered acceptable.

LOCATIONS

Two shallow wells will be installed upgradient of the Site and three wells will be installed downgradient of the Site (two shallow wells and one deep well). The deep well will

TABLE 5.3.5.1*
SUMMARY OF PROPOSED FIELD INVESTIGATION
SJ&J
FARMINGDALE, NEW YORK

Monitoring Wells, Samples, or Borings	Estimated Depth	Purpose
<u>Monitoring Wells</u>		
SW-6	35'	Downgradient of site & additional water level measurement.
SW-7	35'	Upgradient water quality & additional level measurement.
SW-8	35'	Upgradient water quality & additional level measurement.
SW-9	35'	Downgradient of site & additional water level measurement.
DW-6	85'	Determine vertical gradient and deep water quality.
<u>Groundwater Samples</u>		
SW-1	25'-35'	Obtain groundwater quality downgradient of drying beds.
SW-2	25'-35'	Obtain groundwater quality downgradient of leaching pit.
SW-3	25'-35'	Obtain groundwater quality downgradient of leaching pools.
SW-4	25'-35'	Obtain groundwater quality downgradient of flocculation tank, sludge drying beds and underground pipeline. gradient of flocculation tank,
SW-5	25'-35'	Upgradient groundwater quality.
SW-6	25'-35'	Downgradient groundwater quality.
SW-7	25'-35'	Upgradient groundwater quality.
SW-8	25'-35'	Upgradient groundwater quality.
SW-9	25'-35'	Downgradient groundwater quality.
DW-6	75'-85'	Deep water quality downgradient of leaching pit.
<u>Soil Borings/Samples</u>		
<u>Beneath Sludge Drying Beds</u>		
SB-1	2'-2.5', 4'-5'	Obtain shallow soil data for chemical profile.
SB-2	2'-2.5', 4'-5'	Obtain shallow soil data for chemical profile.
SB-3	4'-5',8'-10' 4'-5'	Obtain shallow soil data for chemical profile.
<u>Along Pipeline</u>		
SB-4	IBP	Obtain soil data for shallow chemical profile.
	3'-5'BP	Obtain soil data for shallow chemical profile.
SB-5	IBP, 3'-5'BP	Obtain soil data for shallow chemical profile.
SB-6	IBP, 3'-5'BP	Obtain soil data for shallow chemical profile.
SB-7	IBP, 3'-5'BP	Obtain soil data for shallow chemical profile.
<u>Leaching Pit</u>		
SB-8	6"-12", 1'-3' 3'-5' etc	Obtain soil data for deep chemical profile.
<u>East of Property</u>		
SB-9	1'-2', 3',4', 5'-7'	Obtain soil data for shallow soils near suspect lagoon area
SB-10	1'-2', 3'-4', 5'-7'	Obtain soil data for shallow soils near suspect lagoon area
SB-11	1'-2', 3'-4', 5'-7'	Obtain soil data for shallow soils near suspect lagoon area
SB-12	1'-2', 3'-4', 5'-7'	Obtain soil data for shallow soils near suspect lagoon area
SB-13	1'-2', 3'-4', 5'-7'	Obtain soil data for shallow soils near suspect lagoon area
SB-14	1'-2', 3'-4', 5'-7'	Obtain soil data for shallow soils near pallet storage area
<u>South of Property</u>		
SB-15	5'-7' 10'-12'	Obtain soil data for soils near pit identified in 1966 and 1969 aerial photos (Reference 18)
<u>Background</u>		
BG-1	1'-2', 3'-5'	Obtain background soil data
<u>Sediment</u>		
<u>Leaching Pools</u>		
LP-1	1'-2', 2'-4' 4'-6'etc	Obtain sediment data for chemical profile in vadose zone.
LP-2	1'-2', 2'-4' 4'-6'	Obtain sediment data for chemical profile in vadose zone.
LP-3	1'-2', 2'-4' 4'-6'	Obtain sediment data for chemical profile in vadose zone.

* See Figure 5.3.5.1.1 for sampling locations, Table 5.3.5.2 for summary of sampling, and Table 5.3.5.3 for sample numbering system.

NOTE: IBP = Immediately beneath pipe
BP = Beneath Pipe

TABLE 5.3.5.2
SUMMARY OF SAMPLING
SJ&J
FARMINGDALE, NEW YORK

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Groundwater Samples					
SW-1	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-2	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-3	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-4	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-5	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-6	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-7	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-8	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
SW-9	2	Groundwater	25'-35'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No
DW-6	2	Groundwater	85'-95'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No

Note: Analysis parameters may be reduced for the second round of sampling

Soil Samples

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Beneath Sludge Drying Beds					
SB-1	2	Soil	2'-2.5', 4'-5'	TAL/Cr^{+6}	Yes
SB-2	2	Soil	2'-2.5', 4'-5'	TAL/Cr^{+6}	Yes
SB-3	2	Soil	4'-5', 8'-10'	TAL/Cr^{+6}	Yes

Note: Sample SB-1 (2'-2.5') will also be sampled for TCL VOCs/SVOCs. Also, of the six sludge drying bed samples, the sample with the highest PID reading will be retained for TCL VOCs/SVOCs. If no readings are obtained on PID then only SB-1 (2'-2.5') will be analyzed for TCL VOCs/SVOCs.

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Along Pipeline					
SB-4	2	Soil	IBP, 3'-5' BP	TAL/Cr^{+6}	Yes
SB-5	2	Soil	IBP, 3'-5' BP	TAL/Cr^{+6}	Yes
SB-6	2	Soil	IBP, 3'-5' BP	TAL/Cr^{+6}	Yes
SB-7	2	Soil	IBP, 3'-5' BP	TAL/Cr^{+6}	Yes

NOTE: The sample with the highest PID reading (of the eight samples) will also be sampled for TCL VOCs and SVOC's
IBP: Immediately beneath pipe, BP: Beneath Pipe If the pipe is not located samples will be obtained at 2 to 4' below ground surface. Samples will be obtained at breaks, joints or discoloration of pipe, if none exist, samples will be obtained as listed in Figure 5.3.5.1.1

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Leaching Pit					
SB-8	3	Soil	6"-12", 1'-3', 3'-5', etc.,	TAL, TCL VOCs/SVOCs, Cr^{+6} PCBs	Yes

NOTE: Depth for sample is feet below leaching pit surface. Continuous split spoons will be obtained to the water table. The three samples showing the highest PID readings will be retained for lab analysis. If no PID readings are obtained, samples will be retained at 1'-3', 3'-5', and 9'-11'.

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
East Property					
SB-9	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes
SB-10	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs, and TAL/Cr^{+6}	Yes
SB-11	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs, and TAL/Cr^{+6}	Yes
SB-12	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs, and TAL/Cr^{+6}	Yes
SB-13	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes
SB-14	1	Soil	1'-2', 3'-4', 5'-7'	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes

Note: The sample showing the highest PID reading will be retained for analysis. If no PID readings are obtained, sample will be taken at 3'-4'.

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
South Property					
SB-15	1	Soil	5'-7', 10'-12'	TCL VOCs/SVOCs, TAL/Cr^{+6} for highest PID reading	Yes

NOTE: The sample will be taken from within the former lagoon.

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Background					
BG-1	2	Soil	1'-2', 3'-5'	TCL VOCs/SVOCs, TAL/Cr^{+6}	No

NOTE: BG-1 will be obtained from within boring SW-8. The sample from 3'-5' will also be analyzed for PCBs.

Sediment Samples

Sample ID#*	Number of Samples	Type of Samples	Depth	Analytical Parameters For First Round of Sampling	PID[1] Analysis
Leaching Pools					
LP-1	3	Sediment	1'-2', 2'-4', 4'-6' etc.,	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes
LP-2	3	Sediment	1'-2', 2'-4', 4'-6' etc.,	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes
LP-3	3	Sediment	1'-2', 2'-4', 4'-6' etc.,	TCL VOCs/SVOCs, TAL/Cr^{+6}	Yes

NOTE: The leaching pools will be sampled continuously to the water table and three samples with the highest PID reading will be retained for analysis. For LP-1 and LP-3, only the sample with the highest PID reading will be analyzed for SVOCs. For LP-2 , the two samples with the highest PID will be analyzed for SVOCs. If the depths cannot be selected based on PID analysis, then the depths for analysis of TCL VOCs and TAL/Cr^{+6} will be 1'-2', 4'-5', and 10'-12' below the surface of the leaching pool sediments. The sampling depth for TCL SVOCs will be 4'-5' for LP-1 and LP-3, and 1'-2' and 4'-5' for LP-2.

*See Table 5.3.5.3 for sample numbering system.
1 PID - Photoionization Detector (or other organic vapor detector)
2 TCL VOCs: Target Compound List Volatile Organic Compounds, SVOCs: Semi-Volatile Organic Compounds, TAL: Target Analyte List, Cr^{+6}: Hexavalent Chromium

TABLE 5.3.5.3
SAMPLE NUMBERING SYSTEM
SJ&J
FARMINGDALE, NEW YORK

Matrix	Matrix/Location Code	Example
o <u>Soil</u> Soil Boring (Split-Spoon and hand auger Samples)	SB-	SB-1 (depth)
o <u>Groundwater</u>		
Shallow Well	SW-	SW-2
Deep Well	DW-	DW-2
o <u>Sediment</u>		
Leaching Pool	LP-	LP-1 (depth)

Note:

- o QA/QC samples will be assigned a sequential prefix and number in the shallow well groundwater category. For example, the first field blank obtained will be assigned the number SW-10 (as there are 9 shallow wells).
- o Background samples will be assigned a corresponding prefix and number in the soil boring category. The background samples will be number SB-8 (1-2') and SB-8 (3-5').
- o Each sample designation will be recorded in the field notebook along with the location, depth interval, matrix, and other pertinent information.

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be screened 50 feet into the aquifer in order to obtain head measurements for vertical head differences between the shallow and the deeper zones of the glacial aquifer (water table) as well as obtain deep groundwater quality information. Figure 5.3.5.1.1 shows the proposed locations of the five groundwater monitoring wells (2 shallow wells upgradient, 2 shallow wells downgradient, and 1 deep well downgradient).

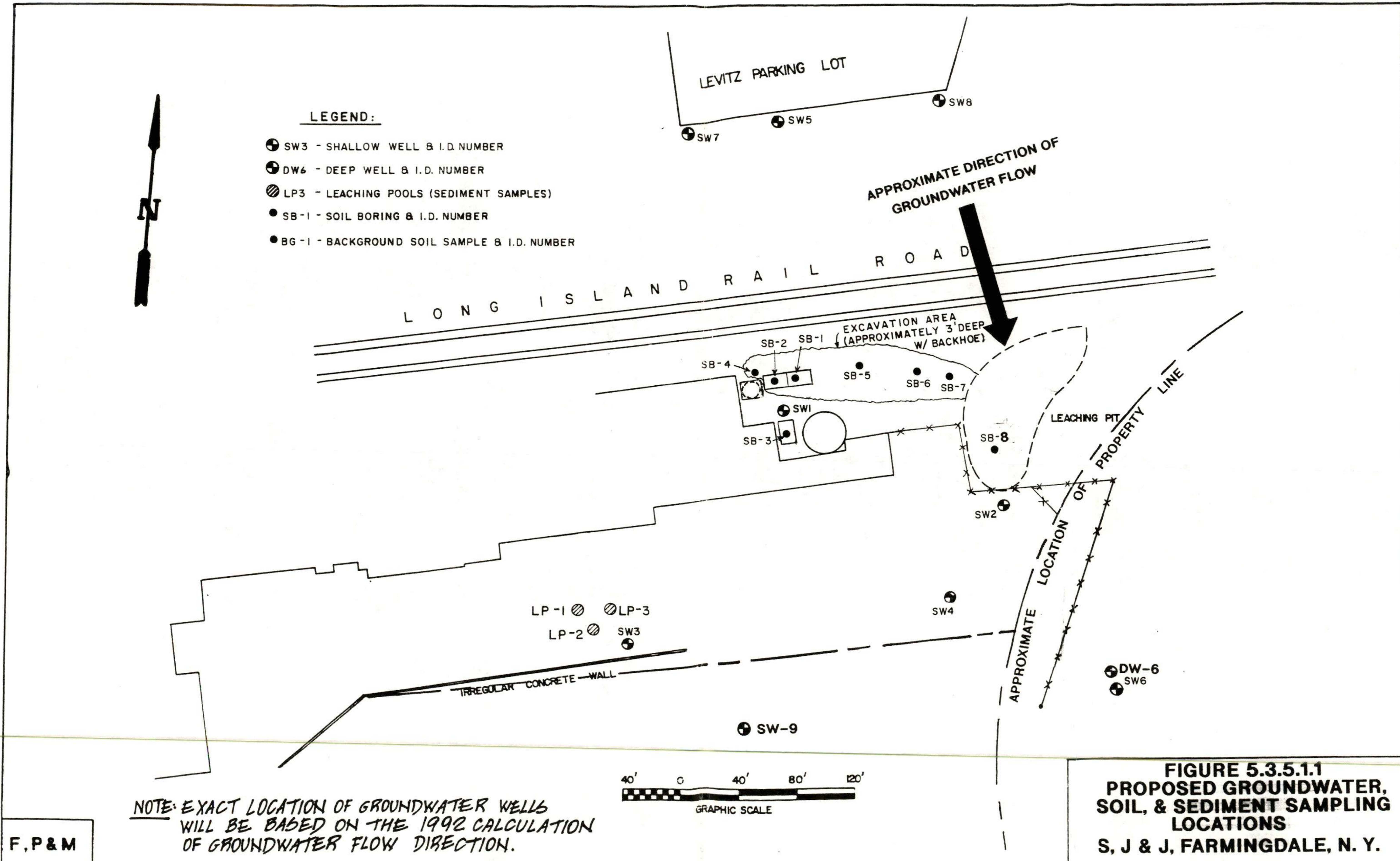
Access to two of the shallow wells (SW-7 and SW-8) will require permission from Levitz. Written requests will be submitted to responsible authorities of the Levitz property describing the need, location and construction requirements for the wells. If any of the existing wells are not functioning, or integrity of any of the wells has been compromised, replacement wells will be installed. The location of any replacement wells will be approved by the EPA.

WELL SURVEY

Once installed, all of the wells will be surveyed by a NYS Licensed Surveyor. Both the top of the PVC and the top of the steel casing will be surveyed for both vertical and horizontal control and tied into U.S. Coast and Geodetic Survey datum (True Datum). The surveyor will make a notch in the top of the PVC (at the measuring point) to allow the Site hydrogeologist to take water level measurements from that point and calculate the elevation of the groundwater surface. All wells will be clearly marked with an ID number (see Table 5.3.5.3 for the well and sample numbering system that will be used for this project).

5.3.5.2 GROUNDWATER SAMPLING

The purpose of the groundwater sampling is primarily two-fold. The first is to substantiate the first round of groundwater sampling performed in 1989 as presented in the Fanning, Phillips and Molnar RI report (Reference 5); the second is to obtain additional water quality data, both upgradient and downgradient of the Site, in order to determine both the vertical and areal extent of potential contamination from the Site. A summary of the groundwater sampling program is presented in Table 5.3.5.2. Figure 5.3.5.1.1 shows the locations of the wells proposed to be sampled.



NOTE: EXACT LOCATION OF GROUNDWATER WELLS WILL BE BASED ON THE 1992 CALCULATION OF GROUNDWATER FLOW DIRECTION.

FIGURE 5.3.5.1.1
PROPOSED GROUNDWATER, SOIL, & SEDIMENT SAMPLING LOCATIONS
S, J & J, FARMINGDALE, N. Y.

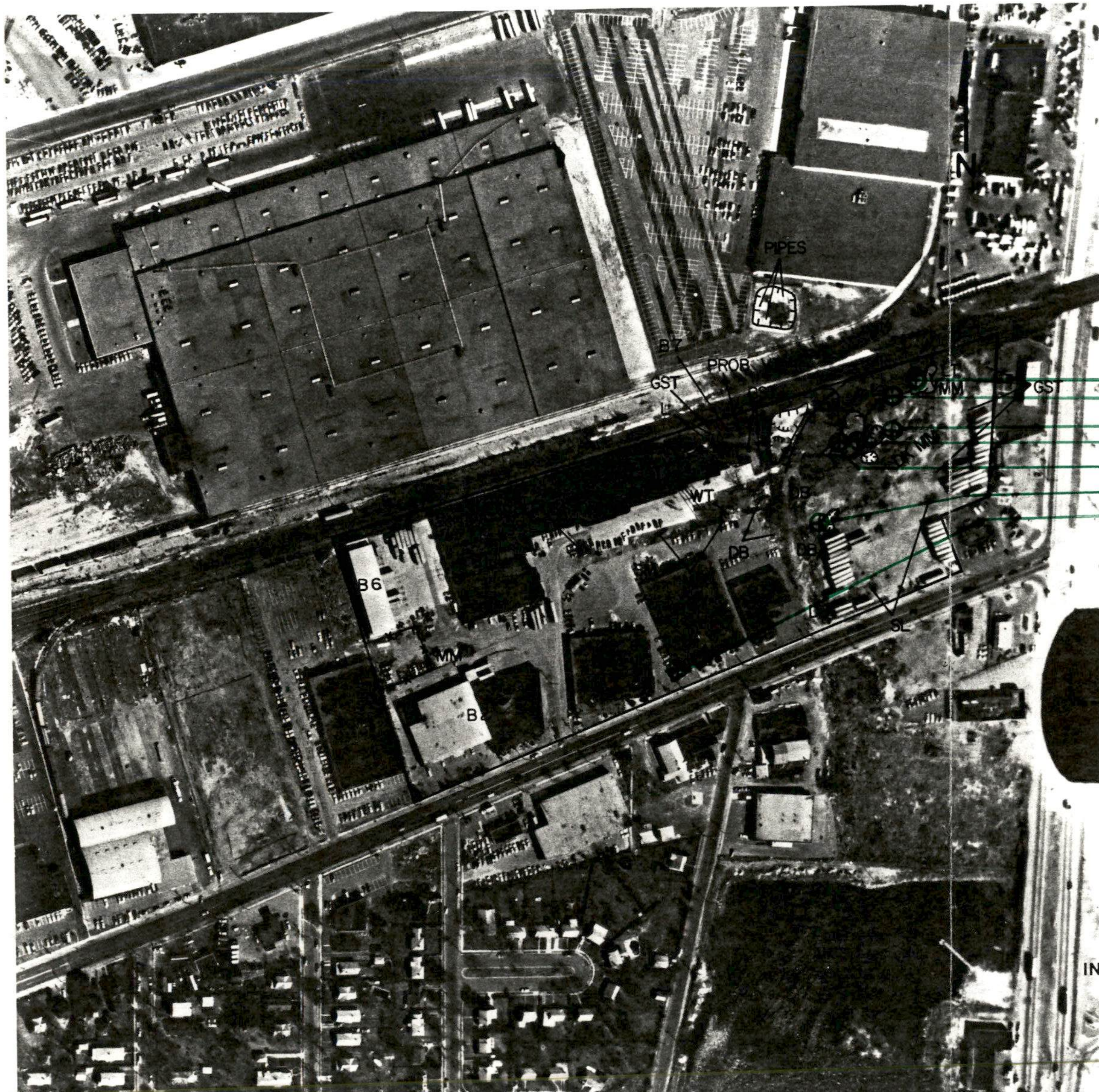
A total of five (5) existing groundwater monitoring wells and five (5) proposed groundwater monitoring wells will be sampled for this RI/FS (a total of 10 groundwater monitoring wells, 9 shallow wells and 1 deep well (see Table 5.3.5.2 for summary). These groundwater samples will be collected in accordance with the procedures outlined in this Section (and will be outlined in the SAP).

Two rounds of groundwater sampling of the 10 wells at the Site will be performed: the first round will occur a minimum of two week after all wells have been developed and the second round will occur within approximately six weeks after the first round of sampling. The parameters analyzed for the first round of groundwater sampling will include TCL VOCs, TCL SVOCs, the Target Analyte List (TAL) (which includes metals and cyanide), and hexavalent chromium. These parameters may be reduced for the second round of sampling based on the results (unvalidated data) of the first round sampling and approval of the EPA.

5.3.5.3 SOIL BORING AND SOIL SAMPLING

Based upon the previous 1990 RI report and meetings with EPA regarding this project, Fanning, Phillips and Molnar proposes to address five specific areas of concern (potential sources of contamination). A significant data base has been compiled for a number of locations to be proposed for soil boring and soil sampling (see Section 3.0). However, this sampling program is intended to provide the information necessary to determine the nature and extent of soil contamination in those areas that have been identified as areas of concern. Based upon the DQOs and data obtained, a risk assessment will be prepared.

There are five areas of concern that will be addressed in the soil boring and soil sampling of the RI/FS work plan. The areas are identified as: (1) beneath the sludge drying beds; (2) along the buried pipe; (3) within the leaching pit; (4) east of the leaching pit (and railroad spur); and (5) soils south of the facility, specifically the pit present in 1966 and 1969 aerial photos. Figures 5.3.5.1.1, 5.3.5.1.2 and 5.3.5.1.3 show the proposed soil boring locations and Table 5.3.5.2 summarizes the number of samples, depth, and laboratory



LEGEND

B - Building
DB - Debris
DK - Dark-Toned
GR - Graded Area
GS - Ground Scar
GST - Ground Stain
HT - Horizontal Tank
L - Lagoon
LT - Light-Toned
M - Material
MM - Mounded Material
SL - Standing Liquid
SM - Scrap Material
VT - Vertical Tank
WT - Water Tower
- Berm
- Fence
- Historical Boundary
- Pit
- Railroad Spur
- Site Boundary

SB-9
SB-10
SB-11
SB-12
SB-13
SB-14
SB-15

EXPLANATION:

⌖ **SB-10** - PROPOSED SOIL BORING LOCATION

INFORMATION SOURCE:
USEPA TS-PIC-87210
SEPTEMBER, 1987

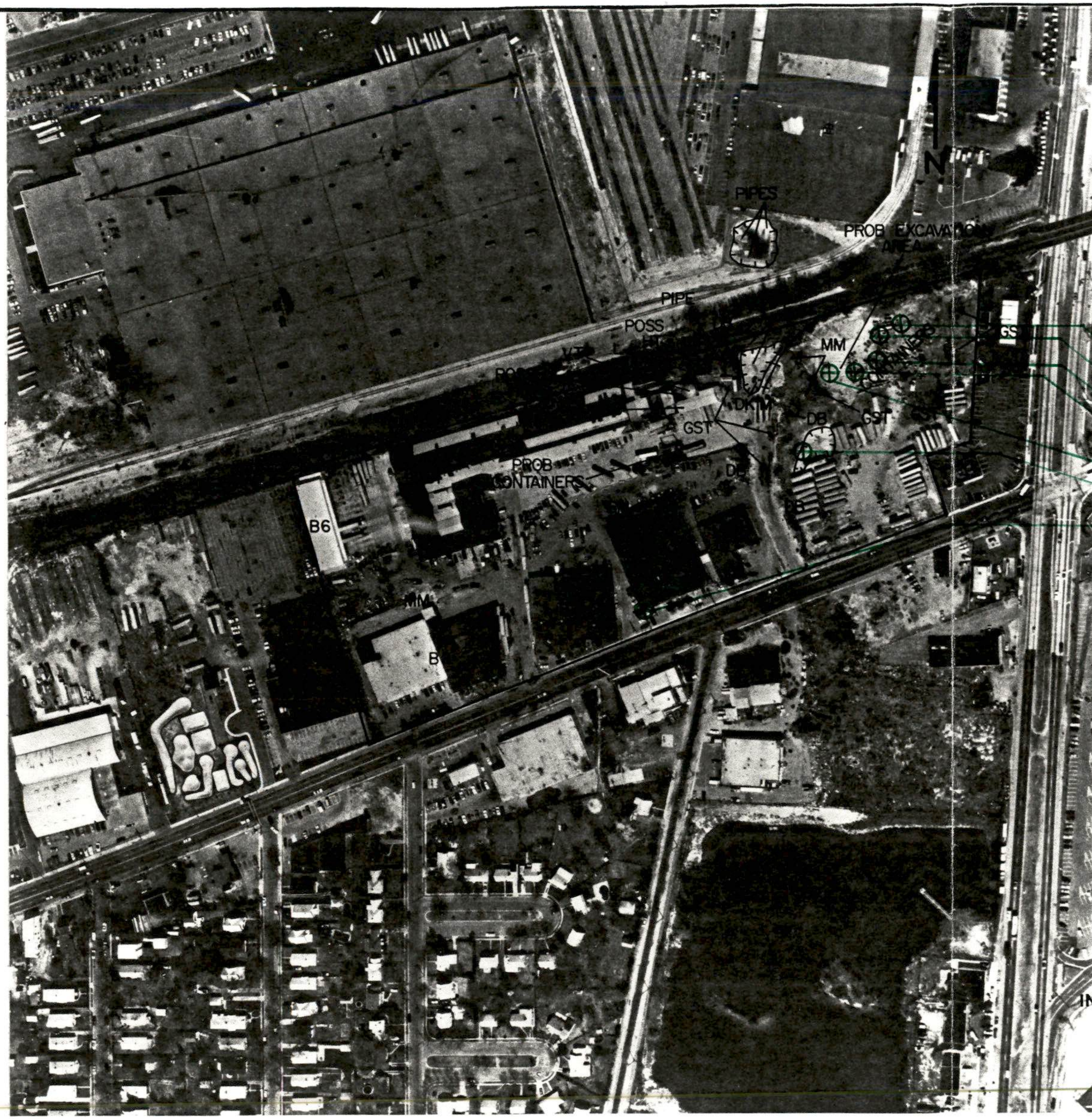
FIGURE 6
KENMARK TEXTILES

MARCH 24,1976

APPROX SCALE 1:2,900

F, P & M

FIGURE 5.3.5.1.2
PROPOSED SOIL SAMPLING LOCATIONS IN EASTERN AREA SHOWN ON 1976 AERIAL PHOTO
S, J & J, FARMINGDALE, N. Y.



LEGEND

B - Building
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SM - Scrap Material
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WT - Water Tower
- Berm
- Fence
- Historical Boundary
- Pit
- Railroad Spur
- Site Boundary

SB-9
SB-10
SB-11
SB-12
SB-13
SB-14
SB-15

EXPLANATION:

⊕ SB-10 - PROPOSED SOIL BORING LOCATION

INFORMATION SOURCE:
USEPA TS-PIC-87210
SEPTEMBER, 1987

FIGURE 7
KENMARK TEXTILES

APRIL 7, 1980

APPROX SCALE 1:2,860

F, P & M

15

FIGURE 5.3.5.1.3
PROPOSED SOIL SAMPLING LOCATIONS IN EASTERN AREA SHOWN ON 1980 AERIAL PHOTO
S, J & J, FARMINGDALE, N. Y.

analysis to be performed on each of the proposed soil samples. In addition to the five areas of concern, soil background conditions will also be investigated on Site at several areas that had no known activity.

BENEATH THE SLUDGE DRYING BEDS

Soil Samples from beneath the Sludge Drying Beds will be obtained at three locations (see Figure 5.3.5.1.1 for all soil sampling locations). A total of two samples will be obtained from each of these locations. The depth intervals for sampling are presented in Table 5.3.5.2. Analysis for these samples will be for TAL and hexavalent chromium. In addition, sample SB-1 (2-2.5' will be sampled for TCL VOCs/SVOCs. Also, of the six (6) sludge drying bed samples, the sample with the highest PID reading will be retained for TCL VOCs/SVOCs. If no readings are obtained on the PID then only SB-1 (2-2.5') will be analyzed for TCL VOCs/SVOCs.

ALONG THE BURIED PIPE LINE

Prior to obtaining any soils samples along the pipeline (as previously performed), a backhoe (and operator) will be contracted to excavate the pipe in order to identify the pipe existence and location. A 3-foot-deep trench will be excavated at this location. The soils within the trench will then be inspected and four locations will be identified for soil sampling. Each location will be sampled at two depths: immediately beneath the pipe and 3 to 5 feet beneath the pipe. Sample locations that will be chosen will be at any evident breaks or joints in the line. If no breaks, discoloration or joints are evident, the locations chosen will be near the previous locations of HB-11, HB-13, HB-16 and HB-17. These locations had slightly elevated concentrations of metals in the previous investigation. After sampling soils will be replaced into the trench.

Soil samples will be tested for TAL and hexavelent chromium as presented and summarized in Table 5.3.5.2. In addition, one sample will be analyzed for TCL VOCs and TCL SVOCs based on the highest PID reading. Soil sampling locations will be identified in the field. However, if consistent with past sampling results along the pipeline, the indicated sampling locations HB-13, HB-16, HB-17 will be selected. In the event that the pipe is not located, the EPA will be notified and one depth interval, 2 to 4 feet below the surface, will be sampled at each location.

LEACHING PIT

One deep soil boring is proposed within the leaching pit. Based upon the previous RI 1990 report, samples obtained within the leaching pit indicates slightly elevated concentrations of select metals. This location will be utilized for soil boring and soil sampling. The depth intervals for soil sampling will be 6 to 12 inches, 1 to 3 feet, 3 to 5 feet, etc. to the water table (continuous split spoon samples). As a portion of the leaching pit has been infilled previously to allow access for a drilling, the sample intervals will begin at the datum obtained from a new survey of the leaching pit base elevation prior to the infilling. The boring, SB-8, will occur in the south half of the leaching pit. From all soil samples obtained, PID analysis will be performed and the three samples with the highest PID readings will be retained for analysis for TAL plus hexavalent chromium, TCL VOCs, TCL SVOCs, and TCL PCBs. If no readings are obtained from the PID then samples will be retained at 1 to 3 feet, 3 to 5 feet, and 9 to 11 feet.

EAST OF THE PROPERTY

A total of 6 soil borings will be performed to the east side of the leaching pit (samples SB-9 through SB-14). Figures 5.3.5.1.2 and 5.3.5.1.3 show the locations of these borings with respect to the locations of concern identified by EPA personnel (Reference 18 and 39). Soil borings will be performed at locations identified as areas of concern (as per the 1976 and 1980 aerial photographs in Reference 18). Samples will be obtained at depth intervals from 1 to 2 feet, 3 to 4 feet, and 5 to 7 feet. Soil samples obtained within each of the borings will be screened with an organic vapor analyzer or PID to determine which sample will receive laboratory analysis. One sample from each boring with the highest total organic vapor will be retained for laboratory analysis. In the event that no OVA readings are recorded, a composite retained for laboratory analysis. In the event that no OVA readings are recorded, a composite soil sample at 3 to 4 feet for TAL plus hexavalent chromium analysis, TCL SVOCs, and a discrete sample at the 3-foot depth for TCL VOCs analysis will be obtained. TCL SVOCs will be collected only at SB-9, SB-13, and SB-14.

All soil borings east of the Site will be performed by use of a decontaminated hand auger. All soil samples obtained for TAL and SVOC analysis will be homogenized by compositing the sample obtained. Soil samples obtained for TCL VOC analysis will not be composited. The hand augers will be decontaminated prior to use and between each of the sampling locations.

SOUTH SIDE 1960'S PIT AREA

One soil boring will be performed on the south side of the leaching pit shown in 1966 and 1969 photos (Reference 18). Figures 5.3.5.1.2 and 5.3.5.1.3 show the location of this soil boring which is identified as SB-15. The majority of the previous pit area is covered by a building. The boring location chosen is the portion of the previous pit area not covered by the building.

Two (2) split-spoon samples or hand auger samples will be obtained within the boring at 5 to 7 feet and 10 and 12 feet. These samples will be screened with an organic vapor analyzer to determine which one sample will receive laboratory analysis. Samples recorded with the highest total organic vapor will be retained for laboratory analysis for TAL/hexavalent chromium, TCL VOCs, and TCL SVOCs. In the event that no OVA readings are recorded, a composite soil sample of the 5 to 7-foot depth and 10 to 12-foot depth samples will be submitted for TAL/Cr^{+6}, TCL SVOC analysis and a discrete sample of the 10 to 12-foot sample will be submitted for VOC analysis.

BACKGROUND SOIL SAMPLES

A total of two background soil samples will be obtained at depths of 1 feet to 2 feet and 3 to 5 feet from within boring SW-8. These soil samples will be tested for TAL/Cr^{+6}, Results from these analyses will be analyzed and will be utilized for comparison to the soil sampling results obtained from the Site.

All sampling locations will be clearly marked and a NYS Licensed Surveyor will survey the location for horizontal control (to U.S. Coast and Geodetic Survey datum).

5.3.5.4 SEDIMENT SAMPLING

Based upon the previous results from the sediment sampling in the 3 leaching pools at the Site (in the vicinity of the former sludge drum storage area), VOCs were detected at these locations. However, the results from the laboratory were not valid and therefore this area requires follow up sampling. A hollow stem auger drill rig will be used to obtain continuous split-spoon samples from the surface sediment (at the base of each of the leaching pools) down to the water table. Each soil sample (within each leaching pool) will be screened for organic vapors with an organic vapor analyzer or PID and the three soil samples recorded with the highest readings will be retained for TCL VOC, TAL, and hexavalent chromium analysis. For LP-1 and LP-3, the sample with the highest PID reading will also be analyzed for TCL SVOCs. For LP-2, the two samples with the highest PID reading will be analyzed for TCL SVOCs. If the depths cannot be selected based on PID analysis, then the depths for analysis of TAL/Cr^{+6} and TCL VOCs will be 1 to 2 feet, 4 to 5 feet, and 10 to 12 feet below the surface of the leaching pool sediment. The sampling depth for TCL SVOCs will be 4 to 5 feet for LP-1 and LP-3, and 1 to 2 feet, and 4 to 5 feet for LP-2.

5.3.5.5 AIR SAMPLING

The purpose of the air sampling is to determine the background or ambient air quality as it pertains to potential sources, pathways and receptors at the site. As the potential contaminants at the Site have not been determined to be volatile organics, there is less of a concern for air sampling. However, in accordance with the HSP for this project, the air quality will be monitored by use of a Photovac Micro Tip or a Foxboro Organic Vapor Analyzer Model-128.

Section 5.3.4.6 of this RI/FS work plan presents a description of the air monitoring (Meteorological Investigation) program that will be implemented by Fanning, Phillips and Molnar. Data gathering locations for the ambient air quality will be plotted on a base map in the RI report. Readings will be obtained daily prior to initiation of work. The estimated time of field work and data collection is approximately 2 to 3 weeks. Parameters that will be recorded will be: temperature, relative humidity, barometric pressure, precipitation, wind direction, wind velocity, and total volatile organic vapors. Dust will also be sampled with an air pump and filtering apparatus. A total of four (4) dust samples will be obtained during Site work. Dust samples will be tested by a EPA CLP laboratory for metals. Section 5.3.4.6 details instruments to be used and methods to be employed for air sampling.

5.3.5.6 SUMMARY

All samples specified in this section will be obtained through the methods as described in each respective section. Locations of sampling are presented in Figures 5.3.5.1.1, 5.3.5.1.2 and 5.3.5.1.3.

5.4 TASK 4 - SAMPLE ANALYSIS/VALIDATION

All environmental samples gathered as part of Task 3 (Section 5.3) will be subjected to a laboratory testing and data validation program. The data validation portion of the program will verify that the analytical results were obtained following the protocols specified in the QA/QC Short Form (Brossman or most recent) and are of sufficient quality to be relied upon in performing the risk assessment, performing the selection and screening of potential remedial action alternatives, and to support a ROD.

5.4.1 DATA VALIDATION

All samples obtained and analyzed by Fanning, Phillips and Molnar will be subjected to data validation by an independent contractor (approved by EPA) using the EPA procedures provided in the EPA's (CLP) SOW (Reference 40) and validation guidelines (Reference 41) or most recent. The results of the data validation will be presented to the EPA as an Appendix to the RI report. The samples to be taken and the parameters to be analyzed for each sample are described in Task 3 (Section 5.3) of this work plan. The analytical testing methods, levels of detection and similar information will be described in more detail in the SAP.

5.4.2 SAMPLING TRACKING

Sample tracking consists of the arrangements for allocating testing with the CLP laboratories. The task includes assuring proper documentation and transport of field samples to the laboratories, correspondence with organizations dealing with the sampling, and assembly of analytical results as they are received. Fanning, Phillips and Molnar will inform EPA upon receipt of data and will provide data as received by the laboratory(ies).

5.5 TASK 5 - DATA EVALUATION

Data collected from this RI will be assembled, reviewed, and carefully evaluated to satisfy the objectives of the investigation. When possible, the data evaluation task will be performed concurrently with Tasks 3 through 7, with the goal of preparing the RI report (Task 9).

The data collected to characterize the Site will be organized and analyzed to identify the extent and nature of contamination, determine groundwater flow direction(s), and identify potential on-site sources(s) of potential contaminants. Appropriate transport models and statistical analytical methods will be employed as necessary. Field data and data resulting from laboratory analysis will be entered into a data base. Boring logs will be prepared for all completed borings, and stratigraphic information developed from the Site borings will be displayed as cross sections or fence diagrams of the Site. Water level elevations measured at the wells will be used to develop plot(s) of the piezometric surface in the aquifer. Both the horizontal and vertical hydraulic gradients will be determined.

The water quality data will be evaluated and mapped to illustrate the areal extent of contaminants detected. Field permeability characteristics will be evaluated through soils analysis. The breakdown products of contaminants detected will be considered to help evaluate potential sources of the contaminants and their environmental behavior.

Maps and tables of the data from the previous sampling programs and from this RI will be prepared for each medium sampled (i.e., soil, groundwater, sediments), to assist in the analysis. Tables comparing the results of the various phases of the RI will be prepared and evaluated. Where differences are observed, field and laboratory procedures, the passage of time and other factors will be evaluated to try to account for the differences. The results of the evaluation will be discussed in the RI report.

5.6 TASK 6 - ASSESSMENT OF RISKS

5.6.1 PUBLIC HEALTH EVALUATION

After the Site investigation information has been evaluated and the data base has been established, a baseline public health evaluation will be performed by EPA (or EPA's contractor) for the Site. The objective of this assessment is to characterize health and environmental risks that would prevail if no further remedial action is taken.

The first step in the public health evaluation is the selection of chemicals for which quantitative risk analyses will be performed. Indicator chemicals will be selected on the basis of a number of factors in order to represent the entire spectrum of compounds measured on Site. These factors include:

- o magnitude
- o prevalence
- o distribution among area matrices
- o toxicity
- o environmental fate
- o presence in background levels
- o frequency detected, and
- o evidence of laboratory contamination

Chemicals of potential interest for this Site are discussed in Section 3.0.

The second step in the public health evaluation is the characterization of potential exposure pathways and receptors. A preliminary identification of the potential populations at risk and the most likely exposure routes was presented in Subsection 3.4. This section also identifies risk assessment objectives based on the type of human exposure that is known about the Site and possible exposure scenarios under current land use. Screening analysis will be used as one approach to eliminate potential exposure pathways that prove to be unrealistic.

In the third step, concentrations of selected chemicals in environmental media at relevant exposure points will then be estimated from the monitoring data, using environmental data and transport models, as appropriate and necessary. The general basis and guidelines used for exposure projections will be in accordance with the Draft Superfund Exposure Assessment Manual (Reference 14). Environmental chemistry and fate data from the literature will be considered and incorporated, where applicable, into all chemical concentration estimates. The estimated concentrations will then be compared to ARARs and other criteria, which are reviewed in Section 3.3. ARARs may be available for many of the indicator chemicals in surface and groundwaters, however, compounds of concern are not automatically excluded from the health-risk assessment based on being below ARARs. If the ARAR is based on a health-risk assessment, then the regulated chemical may be excluded for the risk assessment if it is below the ARAR. For certain pollutants and critical exposure pathways where concentrations exceed or nearly exceed standards, additional risk analyses will be performed to confirm that the pollutant transport models adequately reflect conditions at the Site and to determine additional data needs. If standards and criteria are not available for all of the indicator chemicals, quantitative analyses will be performed according to the general procedures outlined in EPA's Endangerment Assessment Handbook (Reference 42) and the Superfund Public Health Evaluation Manual (Reference 43).

For chemicals (or media-specific contamination) for which ARARs do not exist, individual pollutants will be separated into two categories of chemical toxicity, depending on whether they exhibit carcinogenic or noncarcinogenic effects. Acceptable concentrations in environmental media for noncarcinogens will be developed using risk reference doses (RFDs) or Health Effects Assessments (HEAs). Target risk levels for known or potential carcinogens will be derived using cancer potency factors developed by the EPA's Carcinogen Assessment Group (CAG) and an associated target risk level or range (e.g., 10^{-4} - 10^{-7}).

The fourth step will involve an assessment of toxicity. The primary source of toxicological data used in the analysis will be the most current of the following sources: (1) The Integrated Risk Information System (IRIS), (2) Appendix C of the Superfund Public Health Assessment Manual (Reference 44), (3) the EPA's Health Effects Assessments (HEAs), (4) toxicological profiles prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), and (5) Air and Water Quality Criteria Documents. Target risk levels for carcinogens will be selected after consultation with the EPA. The EPA will also be notified if it is felt that there are valid technical reasons for selecting toxicity values other than those found in the references cited above. In addition, using the references cited, a summary toxicity profile will be developed for each chemical. The toxicity profile will summarize pertinent information regarding the chemical(s) based on EPA contaminant profiles, health effects advisories, ATSDR toxicological profiles, and water quality criteria support documents.

The fifth step will characterize the nature and magnitude of potential risks associated with exposure to soils, groundwater, surface water, sediments and air at the Site. The results should also allow an estimation of potential risks associated with any future remedial activity proposed for the Site.

5.6.2 ENVIRONMENTAL ASSESSMENT

If required, an environmental assessment will be performed for the Site with the objective of ascertaining existing and potential future environmental impacts of the Site if no remedial action is taken. The results of this analysis will then be used in the development and evaluation of remedial alternatives.

A primary methodology to be utilized in assessing aquatic environmental impacts is a comparison of Site water concentration levels to water quality criteria for the protection of aquatic life. These aquatic life criteria, based primarily on toxicity, are listed within the EPA Ambient Water Quality Criteria Document (May 1, 1987, The "Goldbook", Reference 45). In addition, the state has established a set of water criteria for fishing and fish propagation. These data will be combined with the ecological evaluation completed for the RI to qualitatively determine the aquatic impact. In addition, a wetlands/floodplains assessment will be performed and will be based on findings from the field investigation.

To evaluate terrestrial environmental impacts, published information concerning the toxicity of various chemical constituents to terrestrial organisms will be considered in tandem with observations and inventories of biota made during the ecological evaluation. If warranted, concentrations of contamination in on-site contaminated matrices will be extrapolated to probable contaminant concentrations at or within the organism (i.e., extrapolation allowing for dilution, organism uptake, bioaccumulation). Whenever possible, the level of detail will be consistent with the EPA's Endangerment Assessment Handbook (Reference 42).

5.7 TASK 7 - IDENTIFICATION OF CANDIDATE TECHNOLOGIES

Fanning, Phillips and Molnar will submit a Candidate Technologies Memorandum to the EPA. The primary objective is to develop an appropriate range of waste management options that will be analyzed more fully in the detailed phase of the FS. RI Site characterization data will be used to develop alternatives and screen technologies.

5.8 TASK 8 - TREATABILITY STUDIES/PILOT TESTING

The preliminary scoping of remedial alternatives includes the identification of both established and innovative technologies for treating contamination at the Site. Technologies that meet remedial action objectives and pass an initial screening may require treatability studies, either in the laboratory or in the field. The purpose of these studies is to evaluate the applicability, reliability, and cost-effectiveness of the technologies to the Site and to develop operational and cost information for comparisons among the technologies.

If treatability studies are warranted for this RI/FS, the following information will be provided in the treatability work plan:

- o An evaluation of matrices to be treated, the methodology and reliability of the approach
- o Test facility and equipment procurement
- o Equipment operation and testing
- o Sample analysis and validation

Determine whether or not bench-scale or pilot-scale studies are needed, if possible. Factors to consider include:

- o Waste volumes
- o Number of waste-composition and performance variables
- o Type of technology requiring treatability study
- o Length of time available to run test
- o Performance data needs
- o Accuracy of data needs

If it is decided that no treatability studies are necessary, there will need to be justification for that decision as well as anticipated results of the selected treatment technology. Justification will be based on the following factors:

- o Level of technology development on similar applications
- o Level of experience with technology treating similar waste materials
- o Relative removal efficiencies required for Site waste

Since treatability studies for certain technologies can be costly, it is essential to conduct studies only for technologies that pass the initial screening. Another factor that might preclude treatability studies is insufficient information on ambient groundwater quality or the extent of contamination.

As part of this task, Fanning, Phillips and Molnar project team members will need to meet with EPA representatives to discuss the need for and suggested scope of the treatability studies once preliminary analytical results become available. With the EPA's concurrence, Fanning, Phillips and Molnar will submit a written proposal for the studies. The proposal will include the scope of work, the budget and the schedule. During that time Fanning, Phillips and Molnar will also prepare bid packages for selecting qualified testing facilities. The bids will be issued and testing subcontracts will be awarded after the EPA has approved Fanning, Phillips and Molnar's proposal.

5.9 TASK 9 - REMEDIAL INVESTIGATION REPORT

After completion of Tasks 3, 4, 5, 6, 7, Fanning, Phillips and Molnar will make a presentation to the EPA and the State of New York during which the preliminary findings of the RI will be summarized. Following the presentation, a draft RI report will be prepared and submitted to the EPA for review. The report will follow the latest EPA formats as described in EPA guidance documents such as the 1985 "Guidance on RI Under CERCLA" (Reference 46) and the 1988 draft "Interim Final Guidance for Conducting RI/FS under CERCLA" EPA October, 1988 (Reference 6). A draft outline of the report, adapted from the 1988 guidance, is shown in Table 5.9.1. This outline is a draft and subject to some revision, based on the data obtained.

The report will include discussion of the data from the previous sampling programs as well as the data and analyses performed as part of this RI.

When the draft RI report is completed, it will be submitted to the EPA for review and comment.

5.10 TASK 10 - REMEDIAL ALTERNATIVES SCREENING

After data from the existing data base and those collected during the RI are evaluated (Tasks 3 through 7), the preliminary remedial action objectives presented in Section 3.5 will be refined and developed or, if appropriate, eliminated. Based on the then established remedial response objectives and the results of the risk assessment (Task 6), the initial screening of remedial alternatives will be performed according to the procedures recommended in "Guidance on FS under CERCLA" (Reference 47), "Interim Guidance on Superfund Selection of Remedy" (Reference 48) and "Interim Final Guidance for Conducting RI/FS under CERCLA" (Reference 6).

TABLE 5.9.1

GENERIC WORK PLAN*
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

Executive Summary

1. Introduction

    1.1 Purpose of Report

    1.2 Site Background

        1.2.1 Site Description
        1.2.2 Site History
        1.2.3 Previous Investigations

    1.3 Report Organization

2. Study Area Investigation

    2.1 Surface Features (topographic mapping, etc.) (natural and manmade features)

    2.2 Contaminant Source Investigations

    2.3 Meteorological Investigations

    2.4 Surface Water and Sediment Investigations

    2.5 Geological Investigations

    2.6 Soil and Vadose Investigations

    2.7 Groundwater Investigations

    2.8 Human Population Surveys

    2.9 Ecological Investigations

    2.10 Air Investigations

3. Physical Characteristics of the Study Area

    3.1 Surface Features

    3.2 Meteorology

    3.3 Surface Water Hydrology

    3.4 Geology

    3.5 Soils

* Reference 6

TABLE 5.9.1 - (CONTINUED)

GENERIC WORK PLAN
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

3.6 Hydrogeology

3.7 Demography and Land Use

3.8 Ecology

4. Nature and Extent of Contamination

4.1 Sources

4.2 Soils

4.3 Groundwater

4.4 Surface Water and Sediments

4.5 Biota

4.6 Air

5. Contaminant Fate and Transport

5.1 Potential Routes of Migration (i.e., air, groundwater, etc.)

5.2 Contaminant Persistence

5.3 Contaminant Migration

6. Baseline Risk Assessment

6.1 Public Health Evaluation

6.1.1 Exposure Assessment
6.1.2 Toxicity Assessment
6.1.3 Risk Characterization

6.2 Environmental Assessment

7. Summary and Conclusions

7.1 Summary

7.1.1 Nature and Extent of Contamination
7.1.2 Fate and Transport
7.1.3 Risk Assessment

TABLE 5.9.1 - (CONTINUED)

GENERIC WORK PLAN
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

7.2 Conclusions

7.2.1 Data Limitations and Recommendations for future work
7.2.2 Recommended Remedial Action Objectives

Appendices

A. Boring Logs

B. Hydrogeologic Data

C. Analytical Data QA/QC Evaluation Results

D. Risk Assessment Models

E. Toxicity Profiles

Fanning, Phillips and Molnar will make a presentation to EPA and New York State during which preliminary remedial action objectives shall be identified and the development and preliminary screening of remedial alternatives will be summarized.

According to later guidances (References 6 and 49), the development of alternatives will be performed concurrent with the RI. This work plan includes a preliminary identification and discussion of alternatives, although the process of identifying and screening potential alternatives will be ongoing throughout the RI, as new technological and/or site-specific data emerge. The subtasks comprising Task 10 will accomplish the following objectives:

- Development of remedial response objectives and general response actions
- Identification and screening of remedial technologies and process options
- Development and screening of remedial alternatives.

5.10.1 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

Based on the data collected in the RI along with other existing data, the remedial action objectives will be developed. Prior to the development of these objectives, any significant Site problems and contaminant pathways will be identified. Considering these problems and pathways, the remedial response objectives that would eliminate or minimize substantial risks to public health or the environment will be developed further. ARARs will be refined by considering site-specific conditions. Based on the response objectives, general response actions will be delineated to address each of the Site problem areas. These response actions will form the foundation for the screening of remedial technologies. General response actions considered will include the No Action alternative as a baseline against which all other alternatives will be compared.

5.10.2 IDENTIFICATION OF APPLICABLE TECHNOLOGIES/PROCESS OPTIONS AND DEVELOPMENT OF ALTERNATIVES

Based on the remedial action objectives and each identified general response action, potential treatment technologies and their associated containment or treatment and disposal requirements will be identified. A prescreening of these potential treatment technologies for suitability, as part of a remedial alternative, will be conducted. Where several process options exist for a particular technology (e.g., rotary kiln, infrared or circulating bed combustion), the process option for which most data exists and whose capacities/constraints most closely match Site conditions will be selected for further detailed evaluation. The final selection of a process option will occur following the completion of the RI/FS.

Technologies that could prove extremely difficult to implement, might not achieve the remedial objective in a reasonable time, or might not be applicable or feasible based on the site-specific conditions will be eliminated from further consideration. A preliminary identification of technologies has been completed and the results can be found in Section 3.5.2 - Preliminary Identification of Remedial Action Alternatives. However, this preliminary identification will be finalized based on the results of the RI and the established remedial response objectives. The revised list of potential remedial technologies/alternatives will be developed as part of Task 10.

The development of alternatives requires combining appropriate remedial technologies in a manner that will satisfy the response objectives established in Section 3.5 and refining them according to the results of the RI.

As required by SARA, treatment alternatives will be developed in each of the following categories:

- o An alternative for treatment that would eliminate, or minimize to the extend feasible, the need for long-term management (including monitoring) at the site
- o Alternatives that would use treatment as a primary component of an alternative to address the principal threats at the Site
- o An alternative that relies on containment with little or no treatment, but is protection of human health and the environmental by preventing potential exposure and/or by reducing mobility
- o A No Action alternative

5.10.3 <u>SCREENING OF REMEDIAL ALTERNATIVES</u>

The list of potential remedial alternatives developed above will be screened. The objective of this effort is to reduce the number of technologies and alternatives for further analysis while preserving a range of options. This screening will be accomplished by evaluating alternatives on the basis of effectiveness, implementability and cost as specified in the EPA guidance document (Reference 6). These screening criteria are briefly described below:

- Effectiveness Evaluation

  The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide, and the reductions in toxicity, mobility or volume of contaminants it would achieve.

- Implementability Evaluation

  The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered.

  Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

- Cost Evaluation

  Cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analysis. These conceptual cost estimated are order-of-magnitude estimates, and will be prepared based on:

  1. Preliminary conceptual engineering for major construction components

  2. Unit costs of capital investment and general annual operation and maintenance costs available from EPA documents (References 50 and 51) and from Fanning, Phillips and Molnar in-house files.

5.11 TASK 11 - DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

The remedial alternatives that pass the initial screening will be further evaluated. The evaluation will conform to the requirements of the NCP, in particular Section 300.68(h) and Subpart F. It will consist of a technical, environmental and cost evaluation, as well as an analysis of other factors, as appropriate. The detailed evaluation will follow the process specified in the "Guidance on FS under CERCLA" (Reference 47), as updated in the

December, 1986 and July, 1987 Memoranda and "Interim Guidance for Conducting RI/FS under CERCLA" (Reference 6).

In the latter guidance (Reference 6), a set of 9 evaluation criteria have been developed that are to be applied in the evaluation of each Remedial Alternative.

Table 5.11.1 presents the 9 evaluation criteria and the factors considered for each evaluation criterion. A brief description of each criterion is provided:

- Short-Term Effectiveness

  This criterion addresses the effects of the alternative during the construction and implementation phase until the remedial actions have been completed and the selected level of protection has been achieved. Each alternative is evaluated with respect to its effects on the community and on-site workers during the implementation, and the amount of time until protection is achieved.

- Long-Term Effectiveness

  This criterion addresses the results of a remedial action in terms of the risk remaining at the Site after the response objectives have been met. The primary focus of this evaluation is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The factors to be evaluated include the magnitude of remaining risk (measured by numerical standards such as cancer risk levels), and the adequacy, suitability and long-term reliability of management controls for providing continued protection from residuals (i.e., assessment of potential failure of the technical components).

- Reduction of Toxicity, Mobility, or Volume

  This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the contaminants. The factors to be evaluated include the treatment process employed, the amount of hazardous material destroyed or treated, the degree of reduction expected in toxicity, mobility or volume, and the type and quantity of treatment residuals.

TABLE 5.11.1

GENERIC WORK PLAN*
DETAILED EVALUATION CRITERIA
SJ&J
FARMINGDALE, NEW YORK

- o **SHORT-TERM EFFECTIVENESS**
  - Protection of community during remedial actions
  - Protection of workers during remedial actions
  - Time until remedial response objectives are achieved
  - Environmental impacts

- o **LONG-TERM EFFECTIVENESS**
  - Magnitude of risk remaining at the site after the response objectives have been met
  - Adequacy of controls
  - Reliability of controls

- o **REDUCTION OF TOXICITY, MOBILITY OR VOLUME**
  - Treatment process and remedy
  - Amount of hazardous material destroyed or treated
  - Reduction in toxicity, mobility or volume of the contaminants
  - Irreversibility of the treatment
  - Type and quantity of treatment residuals

- o **IMPLEMENTABILITY**
  - Ability to construct technology
  - Reliability of technology
  - Ease of undertaking additional remedial action, if necessary
  - Monitoring considerations
  - Coordination with other agencies
  - Availability of treatment, storage capacity, and disposal services
  - Availability of necessary equipment and specialists
  - Availability of prospective technologies

- o **COST**
  - Capital costs
  - Annual operating and maintenance costs
  - Present worth analysis
  - Sensitivity analysis

* Reference 6

TABLE 5.11.1 - (CONTINUED)

GENERIC WORK PLAN
DETAILED EVALUATION CRITERIA
SJ&J
FARMINGDALE, NEW YORK

- COMPLIANCE WITH ARARs
    - Compliance with chemical-specific ARARs
    - Compliance with action-specific ARARs
    - Compliance with location-specific ARARs
    - Compliance with appropriate criteria, advisories and guidance
- OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
- STATE ACCEPTANCE
- COMMUNITY ACCEPTANCE

o Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. Technical feasibility considers construction and operational difficulties, reliability, ease of undertaking additional remedial action (if required), and the ability to monitor its effectiveness. Administrative feasibility considers activities needed to coordinate with other agencies (e.g., state and local) in regard to obtaining permits or approvals for implementing remedial actions.

o Cost

This criterion addresses the capital costs, annual operation and maintenance costs, and present worth analysis.

Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs. Direct costs include expenditures for the equipment, labor and material necessary to perform remedial actions. Indirect costs include expenditures for engineering, financial and other services that are not part of actual installation of remedial alternatives. Annual operation and maintenance costs are post-construction costs necessary to ensure the continued effectiveness of a remedial action. These costs will be estimated to provide an accuracy of +50 percent to -30 percent.

A present work analysis is used to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year, usually the current year. This allows the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that would be sufficient to cover all costs associated with the remedial action over its planned life. As suggested in the EPA's guidance (Reference 6), a discount rate of 5 percent will be considered unless the market values indicate otherwise during the performance of the FS.

o Compliance with ARARs

This criterion is used to determine how each alternative complies with applicable or relevant and appropriate Federal and State requirements, as defined in CERCLA Section 121.

o Overall Protection of Human Health and the Environment

This criterion provides a final check to assess whether each alternative meets the requirement that it is protective of human health and the environment. The overall assessment of protection is based on a composite of factors assessed under the evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

o State Acceptance

This criterion evaluated the technical and administrative issues and concerns the New York State may have regarding each of the alternatives. The factors to be evaluated include those features of alternatives that the state supports, reservations of the state, and opposition of the state.

o Community Acceptance

This criterion incorporates public concerns into the evaluation of the remedial alternatives.

Often state and community acceptance cannot be determined during development of the FS. Evaluation of these criteria is postponed until the FS has been released for review by the state and public. These criteria are then addressed in the ROD and the responsiveness summary.

After each of the remedial alternatives has been assessed against the 9 criteria, a comparative analysis will be performed. This analysis will compare all of the remedial alternatives against each other for each of the evaluation criteria.

5.12 TASK 12 - FEASIBILITY STUDY (FS) REPORT

A FS report will be prepared to summarize the activities performed and to present the results and associated conclusions for Tasks 1 through 11. The report will include a summary of laboratory treatability findings (if performed), a description of the initial screening study process and the detailed evaluations of the remedial action alternatives studied. The FS report will be prepared and presented in the format specified in "Interim Final Guidance for Conducting RI/FS under CERCLA" (Reference 6).

The FS report will be comprised of an executive summary and four sections. The executive summary will be a brief overview of the FS and the analysis underlying the remedial actions that were evaluated.

The FS will contain the following 4 sections:

- o Introduction and Site Background
- o Identification and Screening of Remedial Technologies
- o Development and Initial Screening of Remedial Alternatives
- o Description and Detailed Analysis of Alternatives

A discussion of each component is presented below. The general format used to develop the FS report is presented in Table 5.12.1.

The introduction will provide background information regarding Site location and facility history and operation. The nature of the problem, as identified through the various studies, will be presented. A summary of geohydrological conditions, remedial action objectives, nature and extent of contamination, and risk assessment addressed in the RI report will also be provided.

The feasible technologies and process options for Site remediation will be identified for each general response action, and the results of the remedial technologies screening will be described.

Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost, will be described.

A detailed description of the cost and noncost features of each remedial action alternative passing the initial screening of the previous section will be presented. A detailed evaluation of each remedial alternative with respect to each of the evaluation criteria will be

TABLE 5.12.1

GENERIC WORK PLAN*
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

Executive Summary

1. Introduction

   1.1 Purpose and Organization of Report

   1.2 Background Information (Summarized from RI Report)

      1.2.1 Site Description
      1.2.2 Site History
      1.2.3 Nature and Extent of Contamination
      1.2.4 Contaminant Fate and Transport
      1.2.5 Baseline Risk Assessment

2. Identification and Screening of Technologies

   2.1 Introduction

   2.2 Remedial Action Objectives --

   Presents the development of remedial action objectives for each medium of interest (i.e., groundwater, soil, surface water, air). For each medium, the following should be discussed:

   - Contaminants of interest
   - Allowable exposure based on risk assessment
   - Allowable exposure based on ARARs
   - Development of remedial action objectives

   2.3 General Response Actions --

   For each medium of interest, describes the estimation of areas or volumes to which treatment, contaiment, or exposure technologies may be applied.

   2.4 Identification and Screening of Techology and Process Options --

   For each medium of interest, describes:

      2.4.1 Identification and Screening of Technologies
      2.4.2 Evaluation of Technologies and Selection of Representative Technologies

* Reference 6

TABLE 5.12.1 - (CONTINUED)

GENERIC WORK PLAN
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

3. Development and Screening of Alternatives

3.1 Development of Alternatives --

Describes rationale for the combination of technologies/media into alternatives. Note: This discussion may be by medium or for the site as a whole.

3.2 Screening of Alternatives

3.2.1 Introduction
3.2.2 Alternative 1

3.2.2.1 Description
3.2.2.2 Evaluation
- Effectiveness
- Implementability
- Cost

3.2.3 Alternative 2

3.2.3.1 Description
3.2.3.2 Evaluation

3.2.4 Alternative 3

3.2.5 Summary of Screening

4. Detailed Analysis of Alternatives

4.1 Introduction

4.2 Individual Analysis of Alternatives

4.2.1 Alternative 1

4.2.1.1 Description
4.2.1.2 Assessment

- Short-Term Effectiveness
- Long-Term Effectiveness and Permanence
- Implementability
- Reduction of Mobility, Toxicity, or Volume through Treatment
- Compliance with ARARs

TABLE 5.12.1 - (CONTINUED)

GENERIC WORK PLAN
RI REPORT FORMAT
SJ&J
FARMINGDALE, NEW YORK

- Overall Protection
- Cost
- State Acceptance
- Community Acceptance

4.2.2 Alternative 2

4.2.2.1 Description
4.2.2.2 Assessment

4.2.3 Alternative 3

4.3 Comparative Analysis

4.3.1 Short-Term Effectiveness
4.3.2 Long-Term Effectiveness and Permanence
4.3.3 Implementability
4.3.4 Reduction of Mobility, Toxicity, or Volume through Treatment
4.3.5 Compliance with ARARs
4.3.6 Overall Protection
4.3.7 Cost
4.3.8 State Acceptance
4.3.9 Community Acceptance

presented. A comparison of these alternatives will also be presented.

5.13 TASK 13 - POST RI/FS SUPPORT

This task includes efforts to prepare the public comment responsiveness summary, support the ROD, conduct any predesign activities and close out the work assignment. All activities occurring after the release of the FS to the public, other than reviewing/finalizing the FS itself, should be reported under this task. The following are typical activities:

- Preparing the predesign report
- Preparing the conceptual design
- Attending public meetings
- Writing and reviewing the responsiveness summary
- Supporting ROD preparation and briefings
- Reviewing and providing QC of the work effort
- Providing task management and QC

SECTION 6.0
PROJECT COSTS

A breakdown of the estimated costs of the Site characterization, field sampling and analysis are presented in Table 6.1. EPA oversight and review costs have been estimated from communication with the EPA at a meeting in March, 1991. The estimated date of completion of these tasks is August, 1992 (for submittal of the Site Summary Report). The estimated cost for the first year is approximately $370,000. It should be noted that these costs reflect only the tasks which are associated with the Site characterization and field sampling and analysis. Estimated costs for the completion of the RI/FS reports will be provided as the scope of work for this project becomes more clearly defined.

TABLE 6.1
ESTIMATED COSTS FOR TASKS ASSOCIATED WITH FIELD INVESTIGATION
PERSONNEL TIME IN DAYS
SJ&J SERVICE STATIONS
FARMINGDALE, NEW YORK

	Tasks	Principal	Senior Hydrogeologist	Associate Hydrogeologist	Assistant Hydrogeologist II	Draftsperson II	Word Processing/ Support	Labor Costs	Estimate of Other Costs		Estimated Period of Billing
1.	RI/FS WORK PLAN AND SCHEDULE (plus revisions)	4	8	30	4	4	5	31,542			AVG. TO OCT., 1991
2.	SAMPLING AND ANALYSIS PLAN	2	4	15	5	2	3	17,455	EPA REVIEW:	$15,000	OCT. TO JAN., 1991
3.	IMPLEMENTATION OF SAMPLING AND ANALYSIS PLAN	2	4	20	20	4	3	28,448	EPA REVIEW/ OVERSIGHT: DRILLER: BACKHOE: TRANSPORTATION & MISC. COSTS FP&M EQUIPMENT CHARGES:	$35,000 $40,000 $3,000 $1,000 $1,500	JAN. TO MARCH, 1992
4.	DATA EVALUATION	1/2	1/2	2			1	2,350	CLP LAB ANALYSIS: DATA VALIDATION: DATA USABILITY (QAO):	$55,000 $12,000 $10,000	FEB. TO MAY, 1991
5.	NOTIFICATION TO EPA OF SAMPLING COMPLETION			1/4			1/4	227			FEB. 1992
6.	SITE SUMMARY REPORT (PLUS REVISIONS)	2	2	15	10	2	4	18,999			MAY TO AUG., 1992
								$99,021	$172,500		

LABOR PLUS OTHER COSTS:	$271,521
35% CONTINGENCY:	$95,032
TOTAL COST:	$366,553

Notes:

- EPA Review and/or oversight charges are based on meeting with EPA, March, 1991
- EPA Review durations are estimated to be 30 days

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SECTION 7.0
SCHEDULING AND ASSUMPTIONS

The Project Schedule for the Site RI/FS is presented on Plate 5.1.1. Note that the task numbers presented in Plate 5.1.1 correspond to the tasks identified in the AOC, not the tasks defined in Section 5.0. The schedule allows (time) for completion of the Final RI/FS from the date the work assignment was received in accordance with the AOC. This assumes that a timely review and approval of documents is obtained from the EPA (30 days).

The schedule for this project is based on assumptions for durations and conditions of key events occurring on the critical and noncritical path. These assumptions are:

- The schedule for the field investigation is dependent on the time for review and approval of all deliverables by the EPA prior to implementing the FOP.
- The schedule is based on a 30 day period for the EPA to review the draft work plan and FOP, and 30 days for them to approve the Final Work Plan and FOP.
- The schedule is contingent upon the duration of data collection.
- Validated data will be obtained within 30 to 60 days after receipt of samples by the CLP analytical laboratory.
- The schedule is based on 30 day review periods for the Draft RI and Draft FS reports and a 30 day review and approval of all revised deliverables.

SECTION 8.0
PROJECT MANAGEMENT APPROACH

8.1 ORGANIZATION AND APPROACH

The proposed project organization is presented on Figure 8.1. The Project Manager (PM) has primary responsibility for plan development and implementation of the RI/FS, including coordination among the RI/FS leaders and support staff, development of bid packages, acquisition of engineering or specialized technical support, and all other aspects of the day-to-day activities associated with the project. The PM identifies staff requirements, directs and monitors Site progress, ensures implementation of quality procedures and adherence to applicable codes and regulations, and is responsible for performance within the established budget and schedule.

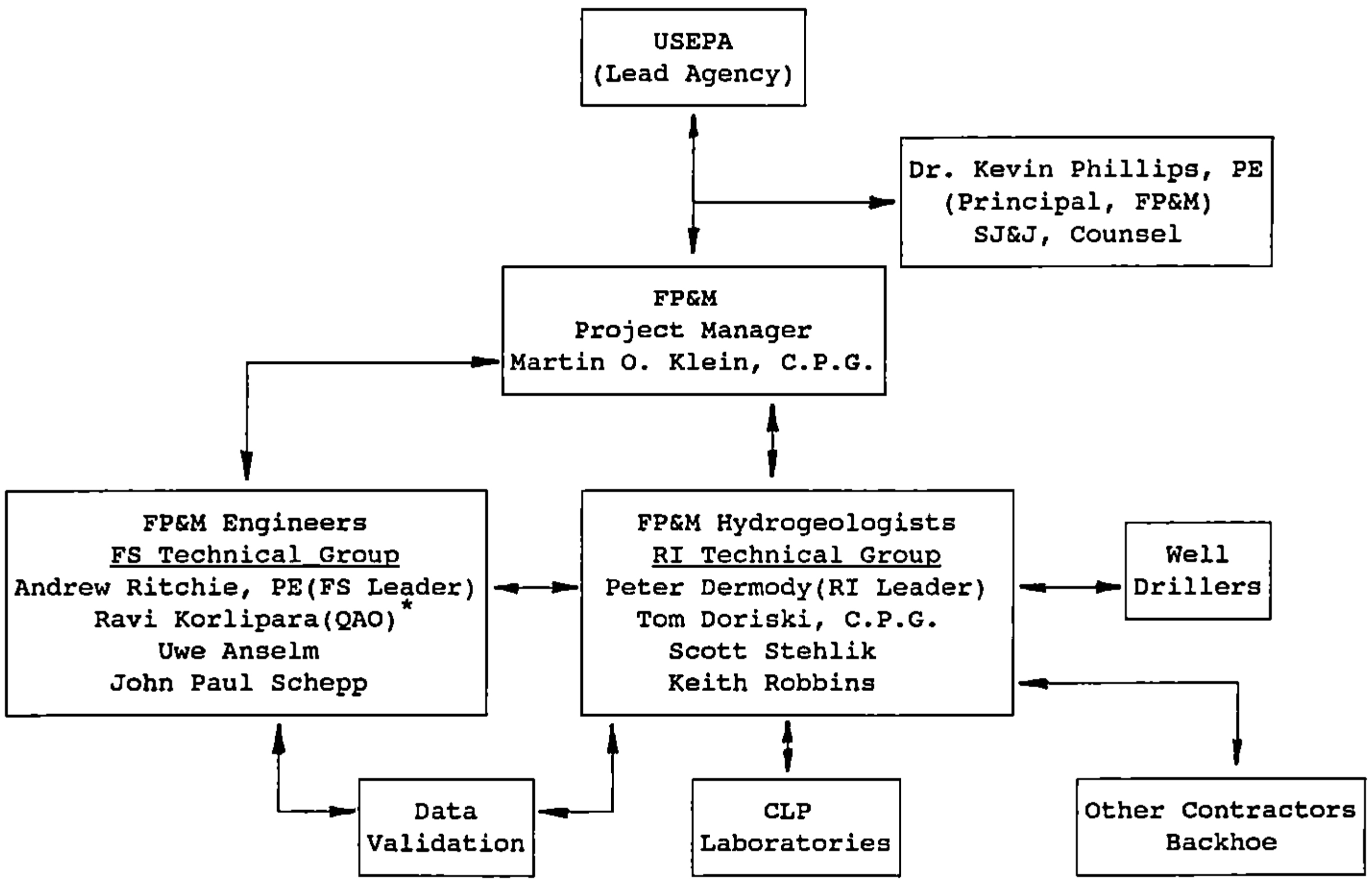
The Quality Assurance Officer (QAO) is a position responsible for overall project quality, including development of the generic program and project QA/QC plans, review of specific task QA/QC procedures, review of laboratory, vendor and subcontractor plans and procedures, and auditing of specific tasks at established intervals. The QAO reports directly to Fanning, Phillips and Molnar's Principal and is independent of the PM's reporting structure.

The RI leader reports to and will work directly with the PM to develop the FOP and will be responsible for the implementation of the field investigation, the analysis, interpretation and presentation of data acquired relative to the Site, and preparation of the RI report (Task 9).

The FS leader will work closely with the RI leader to ensure that the field investigation generated the proper type and quantity of data for use in the initial screening of candidate technologies (Task 7), detailed evaluation of remedial alternatives (Task 11), development of requirements for an evaluation of treatability study/pilot testing, if required (Task 8), and associated cost analysis. The FS report (Task 12) will be developed by the FS technical group.

The RI leader is responsible for on-site management for the duration of all Site

FIGURE 8.1
PROJECT MANAGEMENT CHART
FOR SJ&J RI/FS



* QAO - Quality Assurance Officer

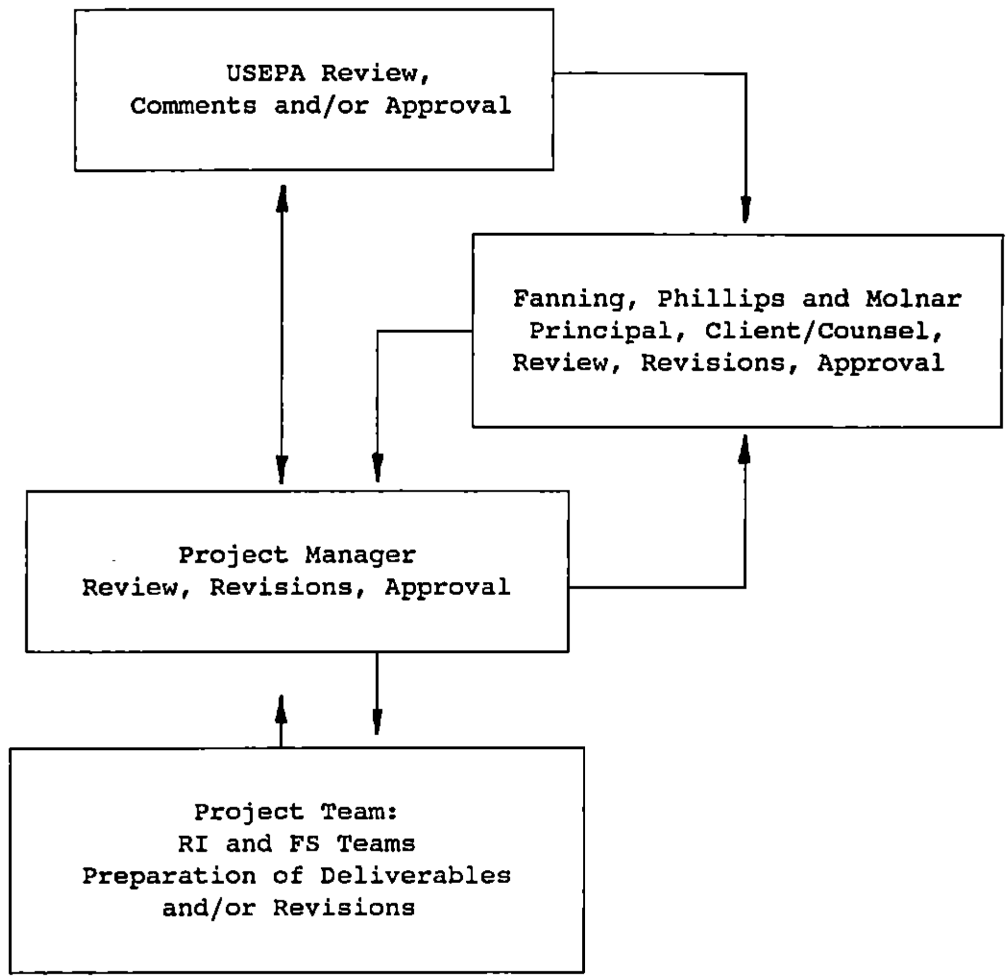
operations, including the activities conducted by Fanning, Phillips and Molnar such as sampling, and the work performed by subcontractors, such as well drilling and surveying. The RI leader will provide consultation and decide on factors relating to sampling activities and changes to the field sampling program.

The RI leader and PM will ensure that the analytical laboratory(ies) will perform analyses as described in the FSAP. The QAO will be responsible for assuming that proper collection, packaging, preservation and shipping of samples is performed in accordance with EPA guidelines. Appendix K includes resumes of key personnel for the RI/FS implementation.

The task numbering system for the RI/FS effort is described in Section 5.0 of this work plan. Each of these tasks has been scheduled and will be tracked separately during the course of the RI/FS work.

Project progress meetings will be held, as needed, to evaluate project status, discuss current items of interest, and review major deliverables such as the FOP and RI/FS reports (see Figure 8.2 for project flow chart for typical deliverables).

FIGURE 8.2
PROJECT FLOW CHART FOR DELIVERABLES (TYPICAL)
SJ&J RI/FS



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ccr165

SECTION 9.0
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SECTION 10.0
GLOSSARY OF ABBREVIATIONS AND DEFINITIONS OF TERMS

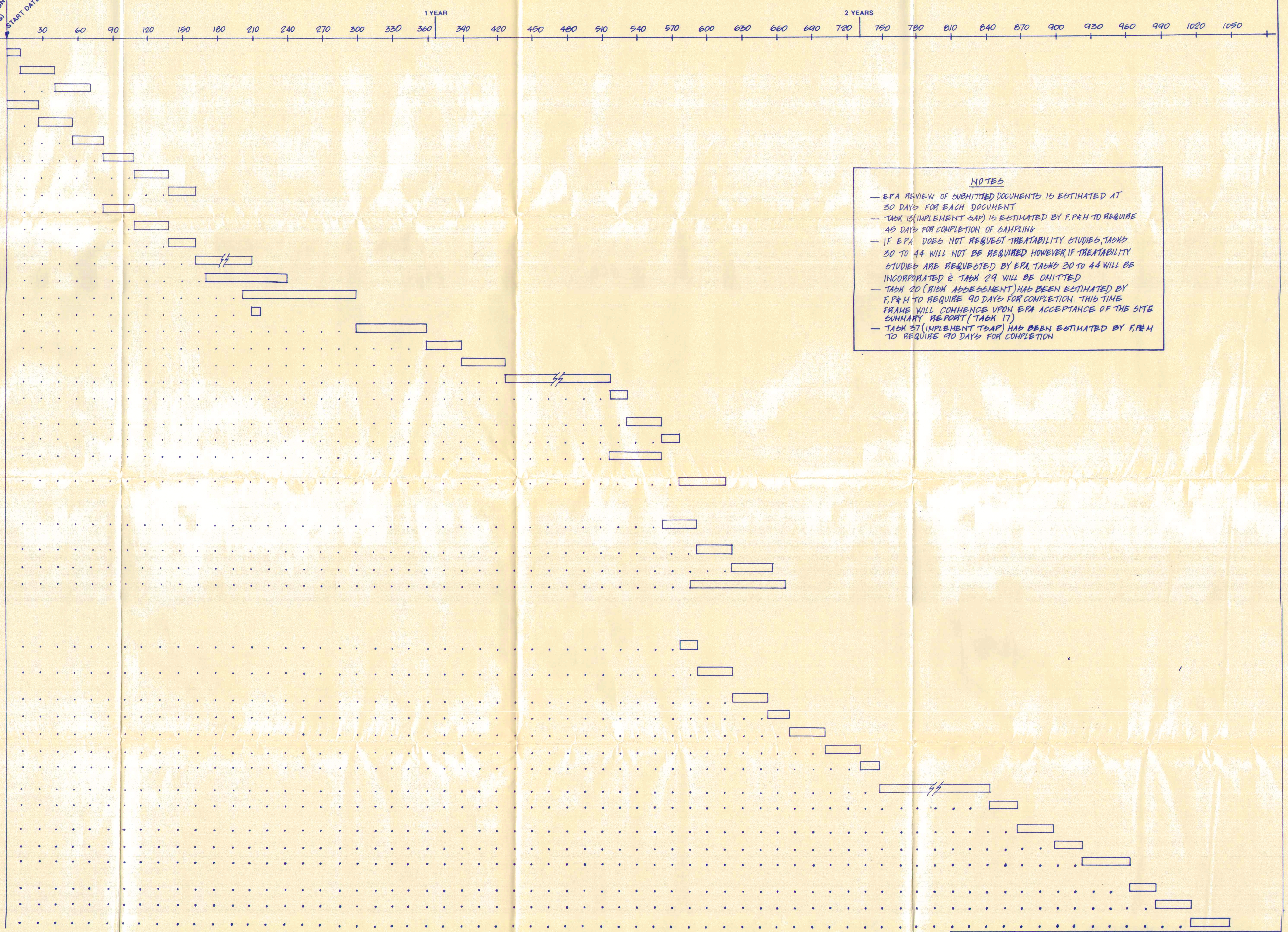
AA	Atomic Absorption
AMSL	Above Mean Sea Level
AOC	Administrative Order On Consent
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
ARCS	Alternative Remedial Contracting Strategy
BNA	Base-Neutral/Acid Extractables
CAG	Carcinogen Assessment Group
CDI	Chronic Daily Intakes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CLP	Contract Laboratory Program
CMA	Chemical Manufacturer's Association
CPF	Carcinogenic Potency Factor
DEC	New York State Department of Environmental Conservation
DOT	Department of Transportation
DQO	Data Quality Objectives
EPA	United States Environmental Protection Agency
FB	Field Blank
FOL	Field Operation Leader
FOP	Field Operation Plan
FS	Feasibility Study
FSAP	Field Sampling and Analysis Plan
GC/MS	Gas Chromatography/Mass Spectrometry
HEA	Health Effects Assessments
HRS	Hazardous Ranking System

HSP	Health and Safety Plan
ICP	Inductively Coupled Plasma
IRIS	Integrated Risk Information System
K	Hydraulic Conductivity
LIRR	Long Island Rail Road
MCLs	Maximum Contaminant Levels
MCLGs	Maximum Contaminant Level Goals
MS	Matrix Spike
MSA	Mine Safety Appliances
MSD	Matrix Spike Duplicate
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NCC	National Climate Center
NCP	National Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NTU	Nephelometric Turbidity Units
NYS	New York State
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OSC	On Scene Coordinator
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste Emergency Response
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PID	Photoionization Detector

PM	Project Manager
PP	Priority Pollutant
PPM	Parts Per Million
POTW	Publicly-Owned Treatment Works
PRAP	Preferred Remedial Alternative Plan
PVC	Poly Vinyl Chloride
QA	Quality Assurance
QAO	Quality Assurance Officer
QC	Quality Control
QAMS	Quality Assurance Management Staff
QAPP	Quality Assurance Project Manager
QR	Quantification Report
RAS	Routine Analytical Services
RCRA	Resource Conservation and Recovery Act
RFD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SAS	Special Analytical Services
SCDH	Suffolk County Department of Health
SCDHS	Suffolk County Department of Health Services
SCDPW	Suffolk County Department of Public Works
SCWA	Suffolk County Water Authority
SDWA	Safe Drinking Water Act
SM	Site Manager
SMP	Site Management Plan
SOP	Standard Operating Procedure

SOW	Statement of Work
SPDES	State Pollution Discharge Elimination System
SS	Sample Splits
T	Transmissivity
TB	Trip Blank
TBC	"To Be Considered" Material
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
TPHC	Total Petroleum Hydrocarbons
TSCA	Toxic Substance Control Act
USCS	Unified Soil Classification System
USDOA	United States Department of Agriculture
USDOI	United States Department of Interior
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound

TASK No.	TASK DESCRIPTION	PREDECESSORS	DURATION (DAYS)
1	NOTIFY EPA AS TO ALL PERSONNEL & CONTRACTORS	0	10
2	EPA PERSONNEL REVIEW	1	30
3	IDENTIFY REPLACEMENT PERSONNEL	2	30
4	RI/FS WORK PLAN & SCHEDULE	0	25
5	EPA WORK PLAN REVIEW	4	30
6	WORK PLAN REVISIONS	5	26
7	SAMPLING & ANALYSIS PLAN	6	25
8	EPA SAP REVIEW	7	30
9	SAP REVISIONS	8	26
10	SUBMIT HEALTH & SAFETY PLAN	SUBMIT W/ 7	25
11	EPA HSP REVIEW	10	30
12	HSP REVISIONS	11	26
13	IMPLEMENT SAP	12	45
14	LABORATORY ANALYSIS	13	67
15	DATA EVALUATION	14	97
16	NOTIFICATION TO EPA OF COMPLETION OF SAMPLING	13	7
17	SUBMIT SITE SUMMARY REPORT	15	60
18	EPA SSR REVIEW	17	30
19	SSR REVISIONS	18	36
20	RISK ASSESSMENT	19	90
21	IDENTIFICATION OF CANDIDATE TECHNOLOGIES	20	16
22	CT REVIEW	21	30
23	CT REVISIONS	22	14
24	PRESENTATION OF PRELIMINARY FINDINGS	20	44
25	PRESENTATION OF REMEDIAL ACTION OBJECTIVES/SCREENING OF ALTERNATIVES	23	40
26	DRAFT REMEDIAL INVESTIGATION REPORT	24	30
27	EPA DRI REVIEW	26	30
28	DRI REVISIONS	27	35
29	DRAFT FEASIBILITY STUDY REPORT	25	80
	IF TREATABILITY STUDIES ARE REQUIRED BY EPA:		
30	TREATABILITY TESTING STATEMENT OF WORK	23	14
31	TREATABILITY TESTING WORK PLAN	30	30
32	EPA TTWP REVIEW	31	30
33	TTWP REVISIONS	32	20
34	TREATABILITY SAP	33	30
35	EPA TSAP REVIEW	34	30
36	TSAP REVISIONS	35	14
37	IMPLEMENT TSAP	36	90
38	TREATABILITY STUDY EVALUATION REPORT	37	25
39	EPA TSER REVIEW	38	30
40	TSER REVISIONS	39	25
41	DRAFT FEASIBILITY STUDY REPORT	40	40
42	PRESENTATION TO DEC	41	21
43	EPA DFS REVIEW	42	30
44	DFS REVISIONS	43	35



NOTES

- EPA REVIEW OF SUBMITTED DOCUMENTS IS ESTIMATED AT 30 DAYS FOR EACH DOCUMENT
- TASK 13 (IMPLEMENT SAP) IS ESTIMATED BY F,P&M TO REQUIRE 45 DAYS FOR COMPLETION OF SAMPLING
- IF EPA DOES NOT REQUEST TREATABILITY STUDIES, TASKS 30 TO 44 WILL NOT BE REQUIRED HOWEVER, IF TREATABILITY STUDIES ARE REQUESTED BY EPA, TASKS 30 TO 44 WILL BE INCORPORATED & TASK 29 WILL BE OMITTED
- TASK 20 (RISK ASSESSMENT) HAS BEEN ESTIMATED BY F,P&M TO REQUIRE 90 DAYS FOR COMPLETION. THIS TIME FRAME WILL COMMENCE UPON EPA ACCEPTANCE OF THE SITE SUMMARY REPORT (TASK 17)
- TASK 37 (IMPLEMENT TSAP) HAS BEEN ESTIMATED BY F,P&M TO REQUIRE 90 DAYS FOR COMPLETION

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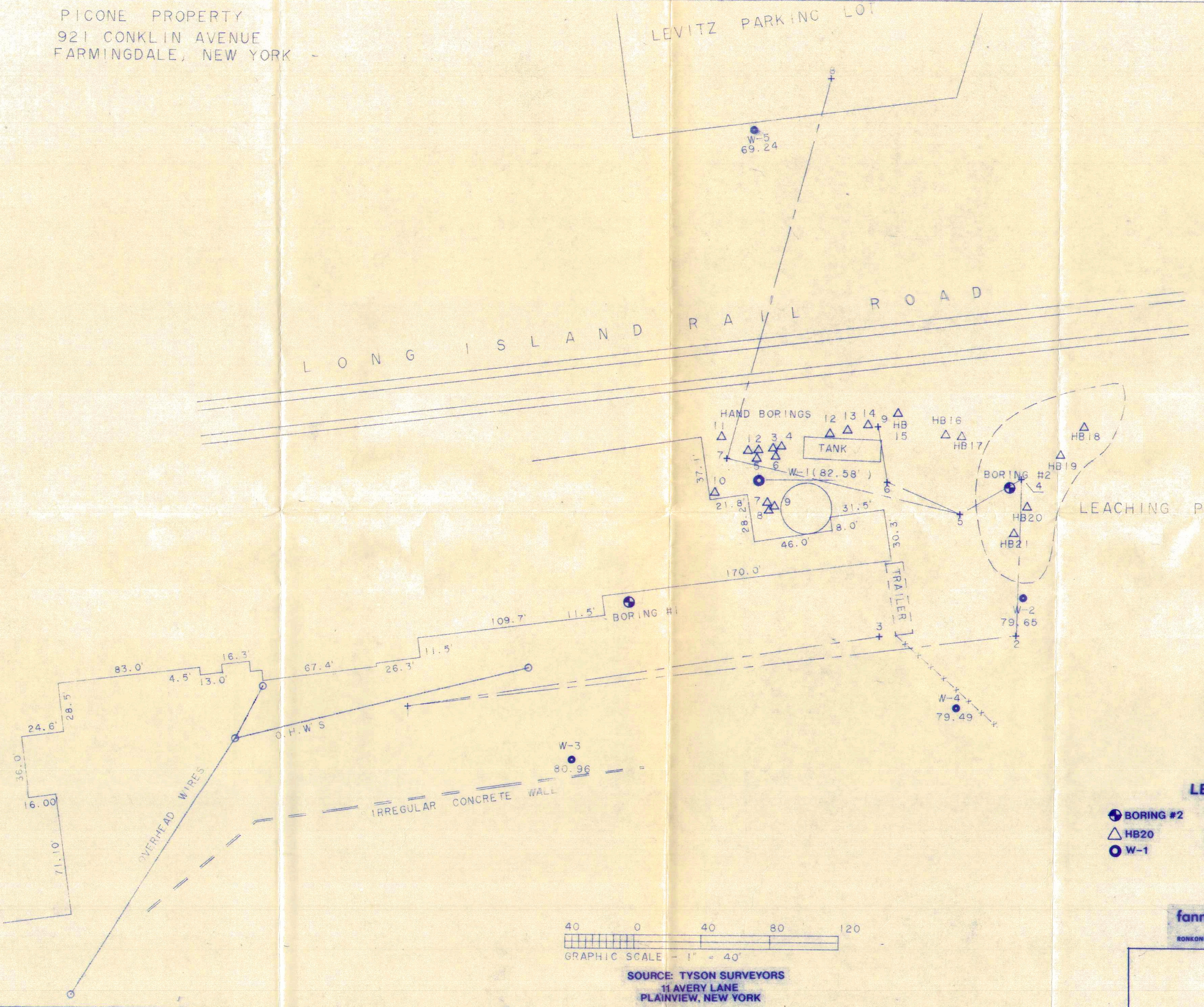
REVISED: 8/19/91

PLATE 5.1.1

RI/FS MILESTONE SCHEDULE FOR SJ&J (AUGUST 1991) BASED UPON ORDER ON CONSENT (INDEX # II CERCLA-10204) (TIME FRAMES ARE IN DAYS)

126-90-02 (1399)



SOURCE: TYSON SURVEYORS
11 AVERY LANE
PLAINVIEW, NEW YORK

LEGEND:

- BORING #2 — SOIL BORING LOCATION
- △ HB20 — HAND SOIL BORING LOCATION
- W-1 — MONITORING WELL LOCATION

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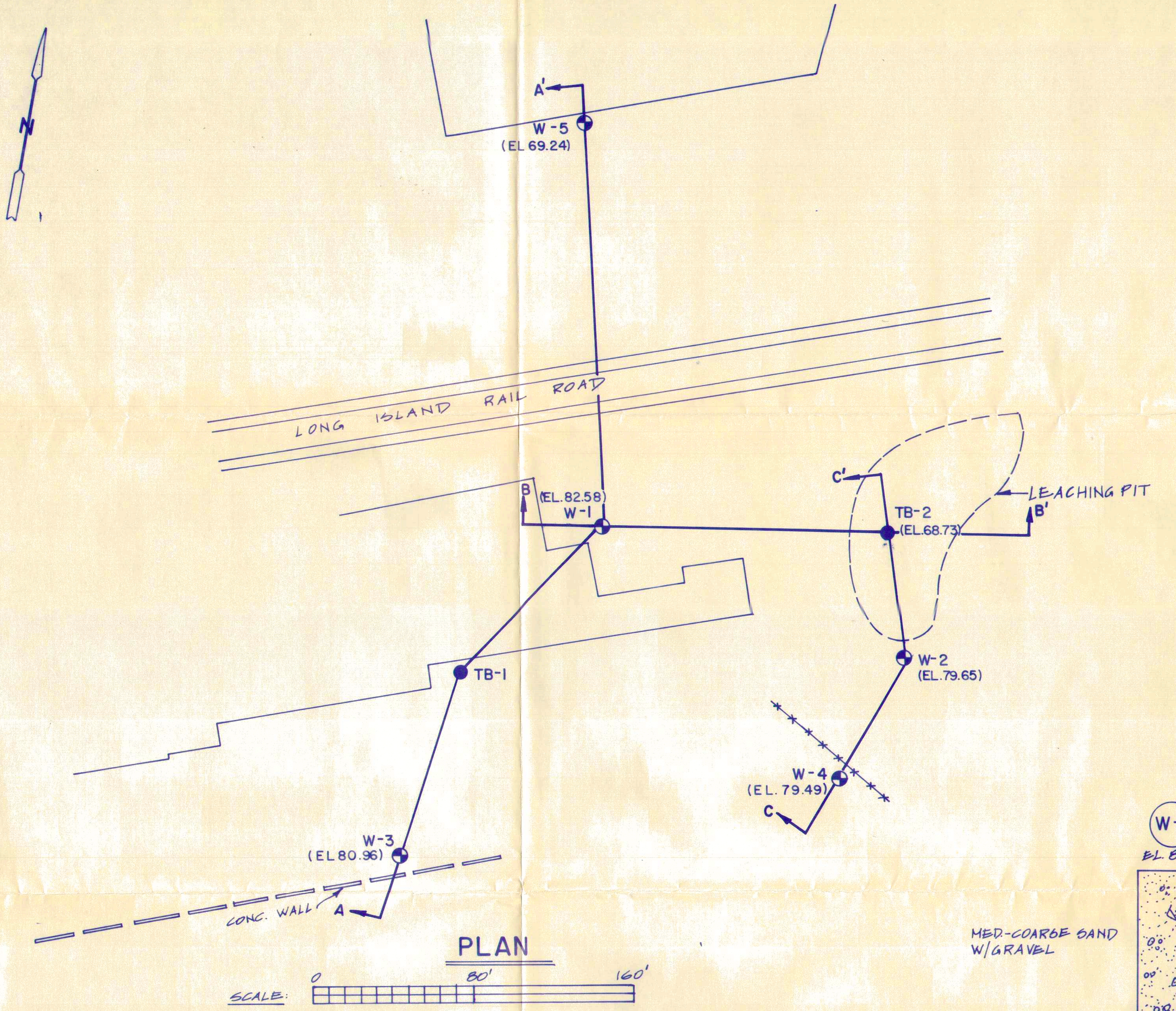
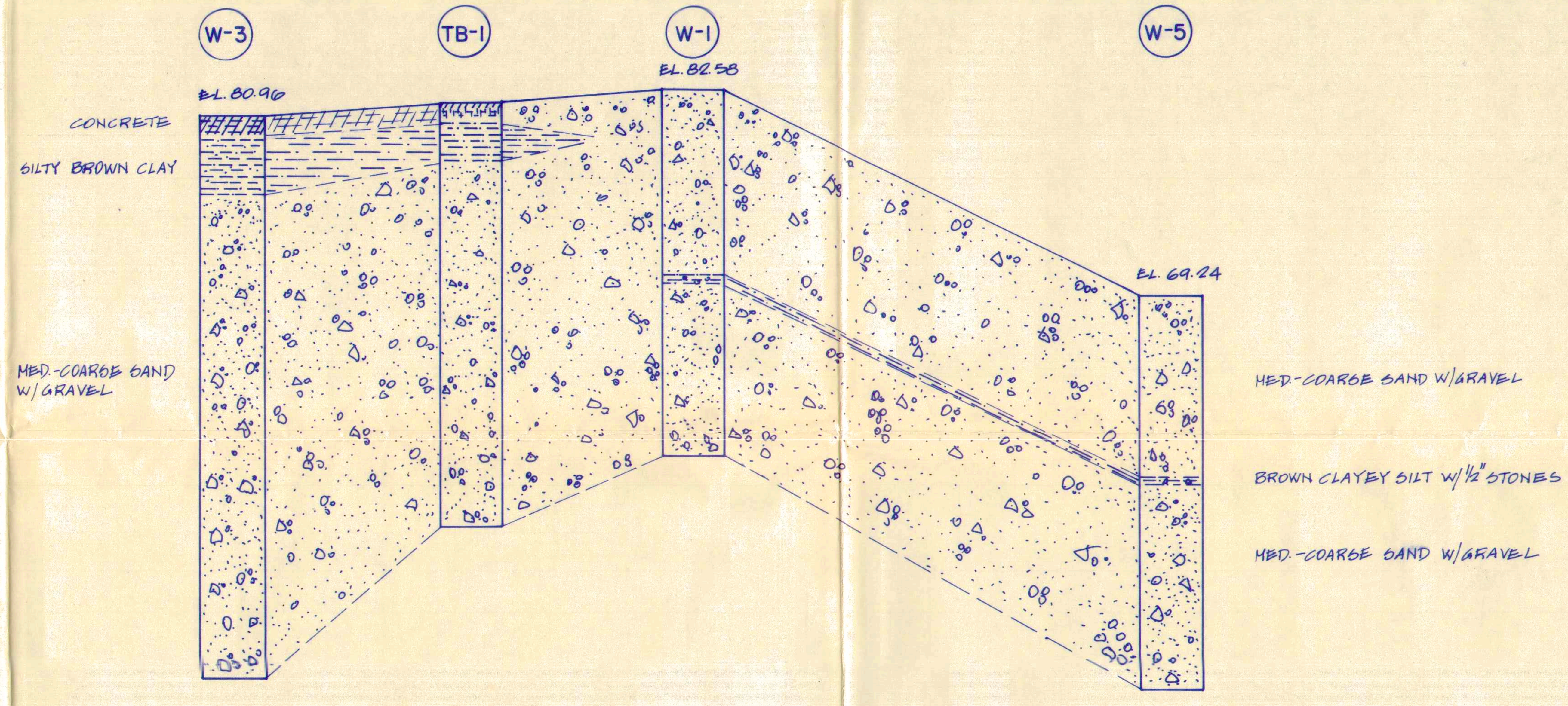
RONKONKOMA NEW YORK

SITE MAP
PLATE 2.1

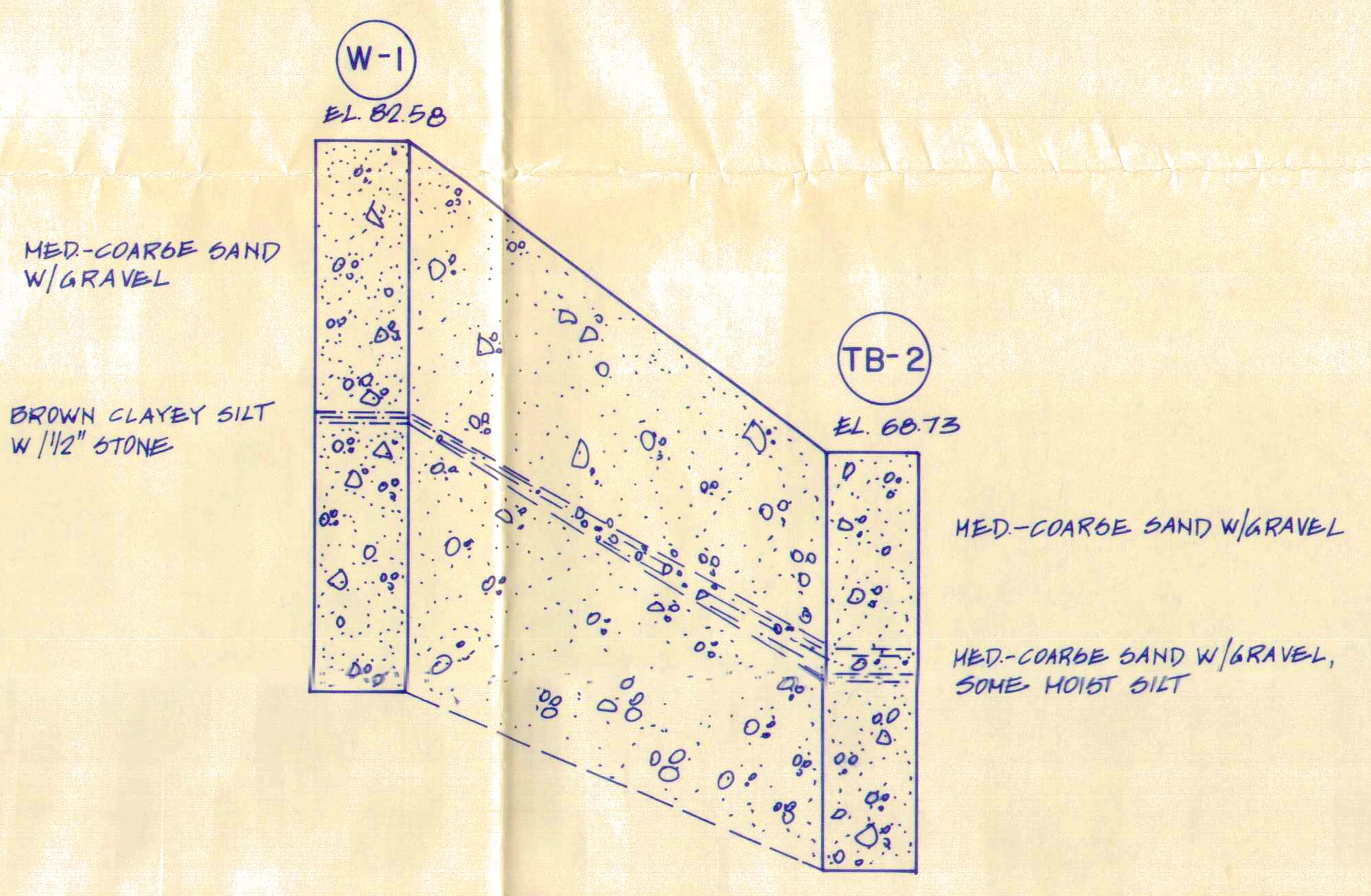
126-87-01(1199)



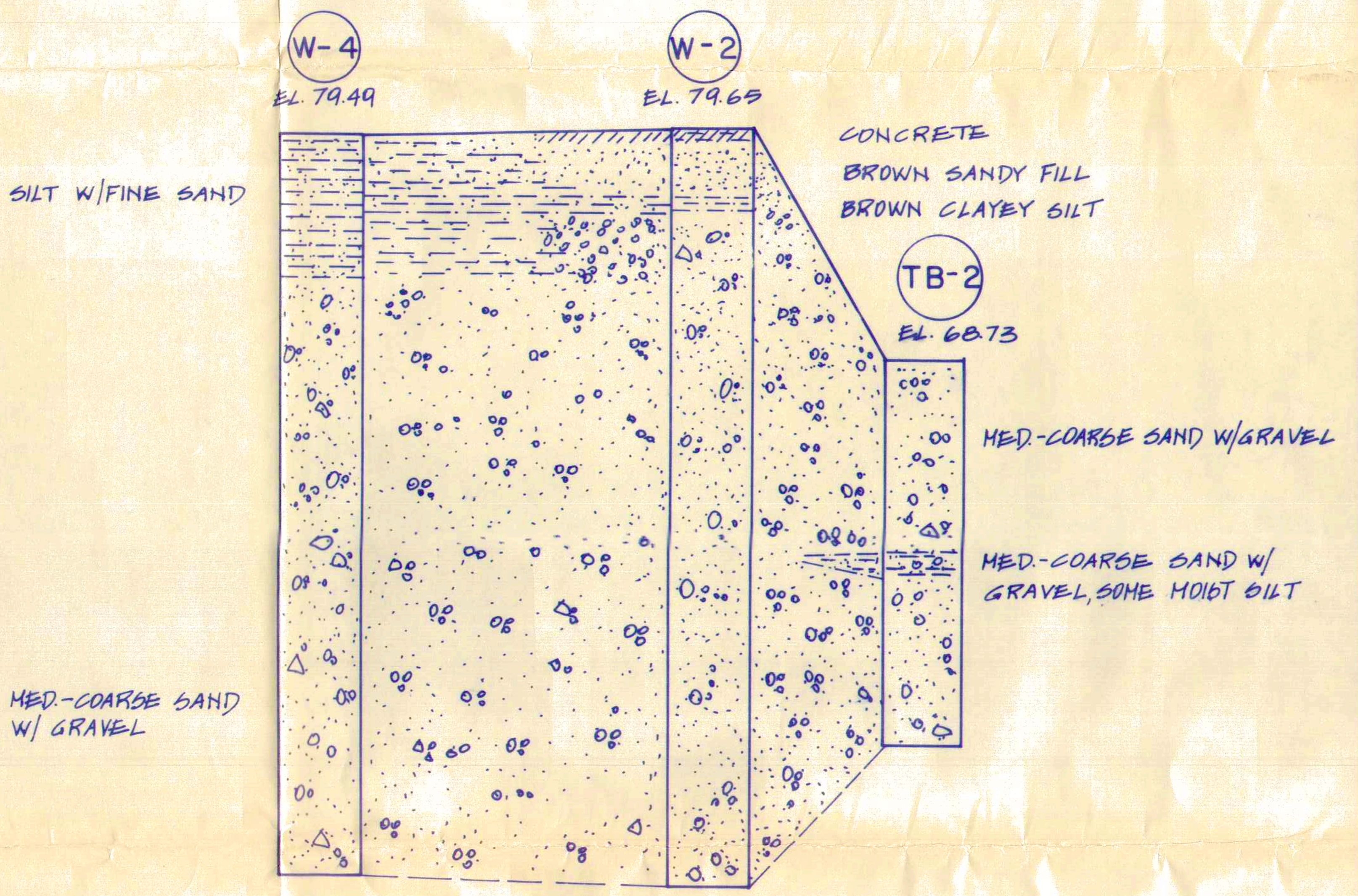
PLAN



CROSS-SECTION A-A'



CROSS-SECTION B-B'



CROSS-SECTION C-C'

SCALE:
HORIZ: 0 80' 160'
VERT: 1" = 6'

PLATE 3.1.3.1

PLAN & CROSS-SECTIONAL GEOLOGY	Drawn By: Haig
	Scale: AS SHOWN
S, J & J 921 CONKLIN AVENUE FARMINGDALE N.Y.	Date: 1/31/89
	Drawing No:
Fanning, Phillips & Molnar Engineers Ronkonkoma New York	Sheet 1 of 1