WORKPLAN FOR
PHASE II HYDROGEOLOGIC INVESTIGATION AT
INACTIVE HAZARDOUS WASTE SITES
IN THE STATE OF NEW YORK

INVESTIGATION
AT

PRIDE SOLVENTS
78 - 88 LAMAR STREET
WEST BABYLON, NEW YORK
SUFFOLK COUNTY

NYSDEC I.D. NUMBER 152111

DECEMBER 1994

PREPARED FOR:

BUREAU OF HAZARDOUS WASTE PROGRAMS
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK 12233

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REVIEWED BY: Bhoj Roopnarine P.E.

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PHASE II HYDROGEOLOGIC INVESTIGATION

AT

PRIDE SOLVENTS & CHEMICAL CO., INC.

78 - 88 LAMAR STREET

WEST BABYLON, NEW YORK

DECEMBER 1994

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PHASE II HYDROGEOLOGIC INVESTIGATION

WORK PLAN

FOR

PRIDE SOLVENTS & CHEMICAL CO. INC.

78 - 88 LAMAR STREET

WEST BABYLON, NEW YORK

DECEMBER 1994

1.0 - INTRODUCTION

Tyree Brothers Environmental Services Inc.,(Tyree), has been contracted to prepare a detailed work plan for the continued Phase II Investigation at the Pride Solvents & Chemical Co., Inc. (Pride) facility located at 78 - 88 Lamar Street, West Babylon, New York. A hydrogeologic investigation was previously conducted by Holzmacher, McLendon and Murrell, P.C. (H_2M) during July - August 1991. The majority of the investigation tasks and analytical were repeated and the report was subsequently revised by Tyree in April - July 1993, for this facility.

This hydrogeologic investigation is to be continued in order to comply with the requirements of the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Part B permit and of the New York State Department of Environmental Conservation (NYSDEC) Bureau of Hazardous Waste Facility Management, Division of Hazardous Substances Regulation. This portion of the investigation is to directly focus on several areas of documented releases at the facility.

Specifically these areas are; those affected by the State Pollutant Discharge Elimination System (SPDES) violations and drywell contamination of 1980, 1981, 1982 and 1984; the

areas affected by the leaking underground storage tanks (UST's) found in 1985; the contaminant release caused by the arson fire of 1981; the forklift related spill of 1983; the prior outside container storage area (POCSA); the abandoned drywells numbers seven (7) and eight (8), as well as other areas of suspect contamination.

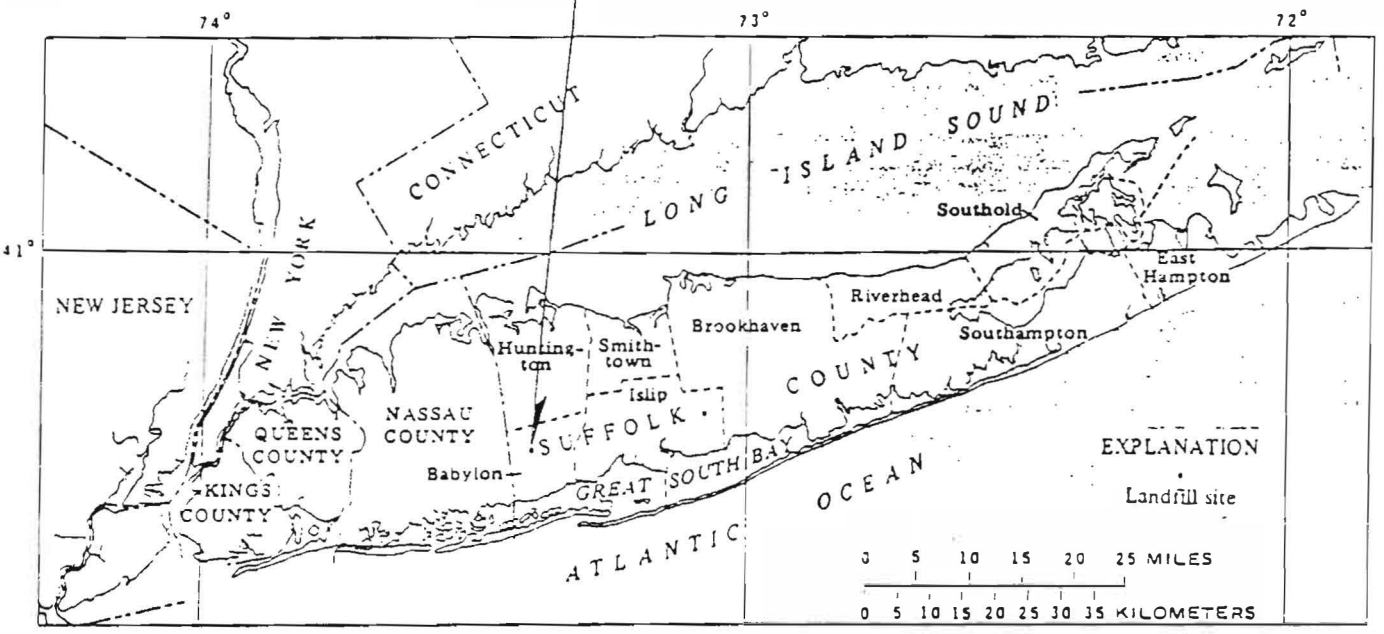
Where applicable and practical, procedures, equipment etc. will be specified to conform with those previously proposed and approved by the regulatory agencies for the 1993 investigation. Also some of the figures and diagrams in this work plan have been reproduced in their entirety as they appeared in the 1993 report, or with some appropriate modifications to suit their application within this document.

2.0 - SITE RECONNAISSANCE AND BACKGROUND

The Pride site is located in southwestern Suffolk County, approximately three miles east of the Nassau County border (Figure 1). The site, located at 78-88 Lamar Street in West Babylon, New York (Figure 2), is approximately 1.3 acres in size and consists of two (2) buildings. The majority of the outdoor property is either asphalt or concrete paved and is generally flat. Small portions of the property to the east of each building are grass and landscaped areas (Figure 3). The property has been occupied by the current owner since 1973.

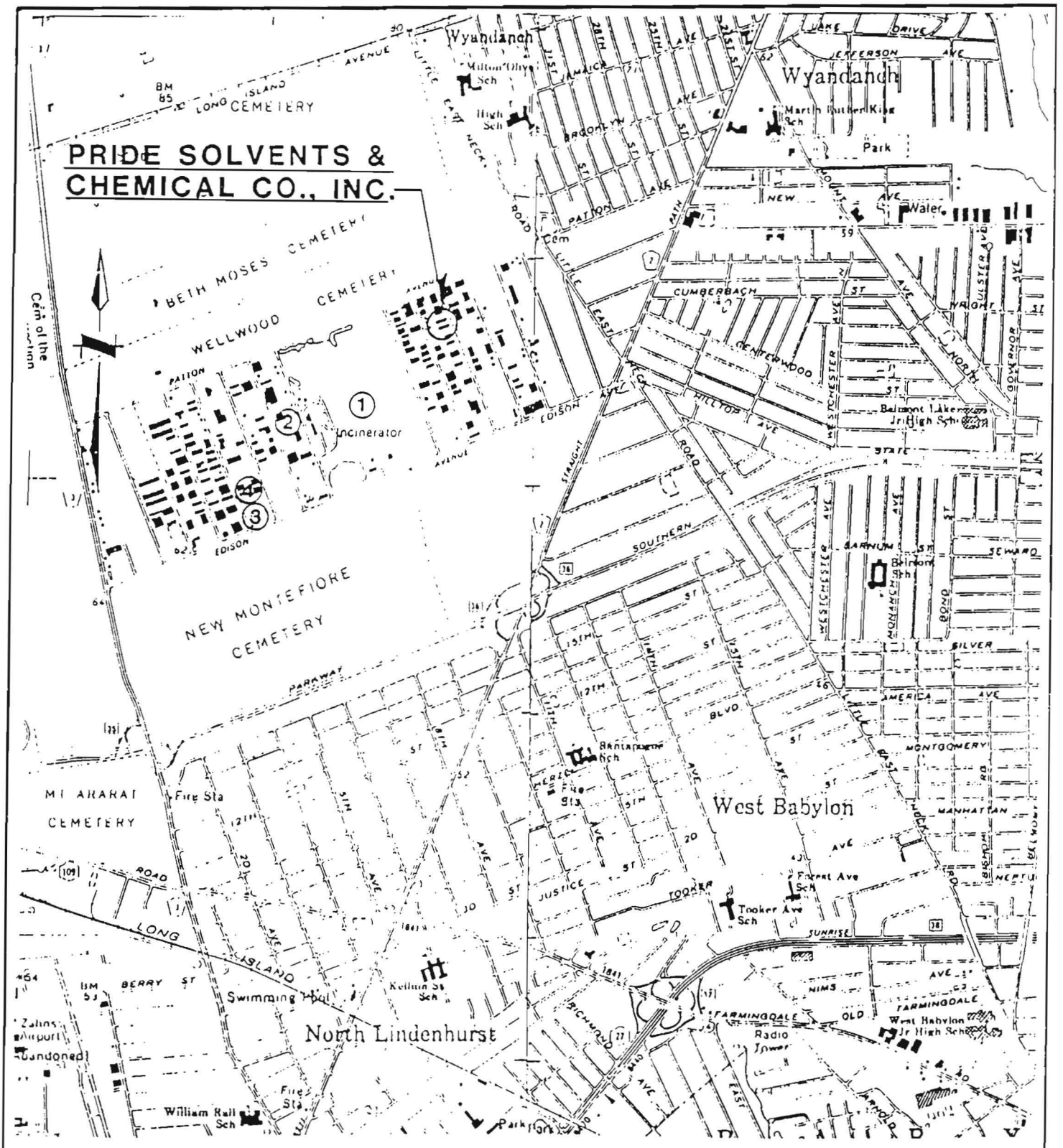
The facility operates as a commercial chemical and solvent distribution and solvent reclamation facility. It is currently regulated as a hazardous waste treatment, storage and disposal facility under a Resource Conservation and Recovery Act (RCRA) part B Permit (EPA ID No. NYD 057722258). The facility is equipped to receive and store waste chlorinated and fluorinated solvents, then reclaim the material by a distillation process.

PRIDE SOLVENTS &
CHEMICAL CO., INC.



SITE & LOCATION MAP

FIGURE 2



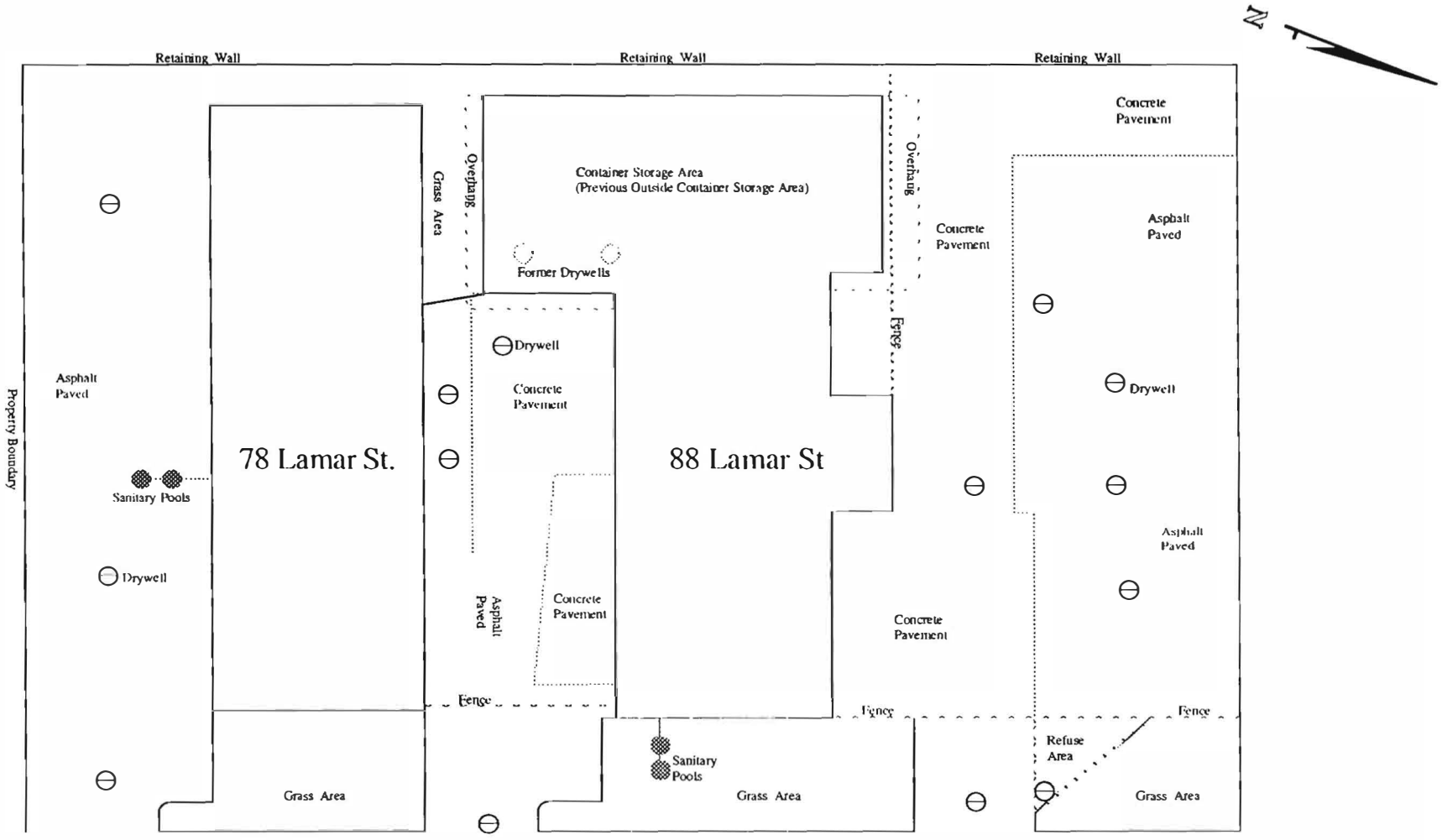
NYSDEC INACTIVE HAZARDOUS WASTE SITES

① BABYLON LANDFILL
② U.S. ELECTROPLATING
③ SPECTRUM FINISHING
④ NTU CIRCUITS

LOCATION MAP

SCALE: 1"=2000'

H2MGROUP
ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. RIVERHEAD, N.Y. FAIRFIELD, N.J.



Lamar Street

Tyree Brothers
Environmental Services, Inc.
208 Route 109
Farmingdale, New York 11735

Figure 3 : Site Map

PRIDE SOLVENTS
78 - 88 Lamar Street
W. Babylon, New York

Drawn By: Rick Caputo
Date: 12 - 19 - 94
Scale: 1" = 40'

A listing of organic solvents historically distributed and drum inventories are included in Appendix A of the 1993 hydrogeologic investigation. A description of the two different operations at the facility are provided below.

2.1 - 78 Lamar Street

The operations at the 78 Lamar Street facility include the reclamation of chlorinated and fluorinated solvents by distillation. The reclamation area is approximately 3,300 square feet (sf) utilized primarily for drum storage with 800 sf involved in the actual reclamation and distillation process.

Pride receives chlorinated solvent wastes and freons exclusively in 55-gallon drums. The wastes are stored indoors within a spill containment area which consists of an epoxy coated concrete bermed warehouse. No bulk shipment of waste solvents are accepted. Waste solvents are accepted only from customers who purchase virgin solvent products from Pride.

The 78 Lamar Street facility currently has three above ground distillation storage tanks which are used to store product for a limited time before being pumped into drums for storage and eventual shipping.

2.2 - 88 Lamar Street

Operations at the 88 Lamar Street facility are strictly limited to bulk storage, drum packaging and distribution of non-flammable, flammable and combustible organic solvents. No processing or manufacturing operations are conducted in this building. Prior to January 1991, the 88 Lamar Street facility contained sixteen (16) underground storage tanks. In addition, the western section of this building was the POCSA of concern as mentioned earlier. This area was enclosed and covered for drum storage in 1982 (Figure 4).

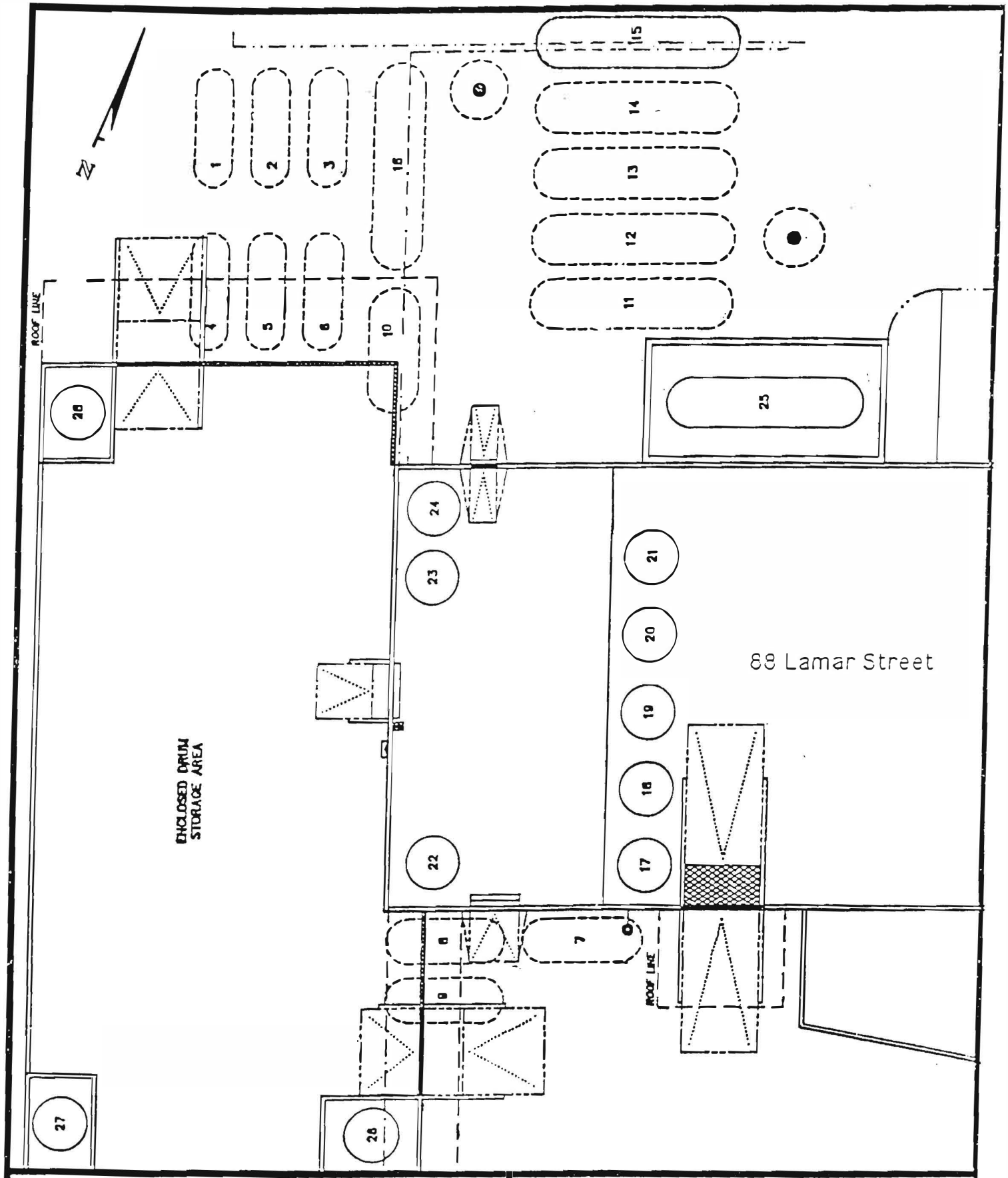


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Figure 4: Tank Location Map

Pride Solvents
78 - 88 Lamar Street
W. Babylon, New York

2.3 - Surrounding Properties

The Pride site is located within an industrial park known as the West Babylon Industrial Area which also includes some residential housing. Numerous manufacturing and commercial facilities surround the site. These include a distribution and trucking company, photographic facility, printing operation and an industrial and office warehousing company.

The entire West Babylon Industrial area has been classified as a NYSDEC Class 2 inactive hazardous waste site. There are four (4) other NYSDEC listed inactive hazardous waste sites within a one-quarter mile radius of the Pride site as reported in the NYSDEC Division of Solid and Hazardous Waste April 1991 Annual Summary Report.

These sites include the Babylon Landfill, U.S. Electroplating Corporation, NTU Circuits and Spectrum Finishing Corporation. The location of these sites relative to the Pride site is depicted in Figure 2. None of these sites appear to be hydraulically upgradient to the subject site.

2.4 - Local Hydrogeology

The area comprising the Pride facility is underlain by glacial deposits consisting primarily of fine to coarse grained sands with fine gravel. Depth to ground water ranges from approximately eight (8) to ten (10) feet below grade across the site, as determined from previous investigation.

During the 1991 hydrogeologic investigation, five (5) monitoring wells were installed into the Upper Glacial aquifer in locations shown in Figure 5. The relationship of the buildings, drywells and monitoring wells at the facility and the underlying hydrogeology are also depicted.

* NOTE: Based on data collected April 7, 1993

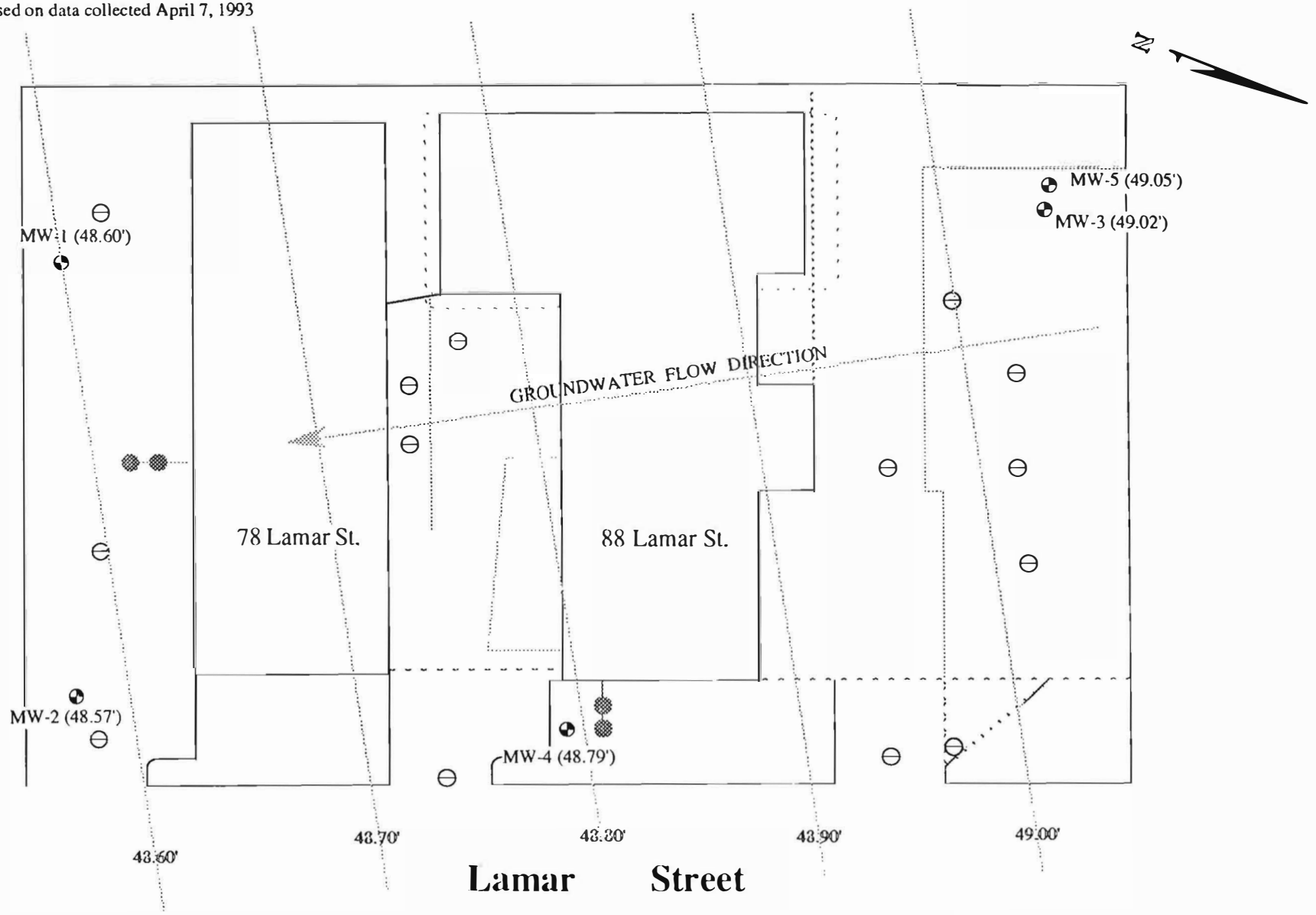

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Figure 5 : Hydraulic Gradient Map

PRIDE SOLVENTS
78 - 88 Lamar Street
W. Babylon, New York

Drawn By: Rick Caputo
Date: 12 - 19 - 94
Scale: 1" = 40'

Four (4) of the five (5) existing wells were installed as shallow water table wells, completed with a screened interval approximately ten (10) feet into the water table and five (5) feet above. The fifth monitoring well (MW-3) was completed as a deeper couplet to MW-5 with a ten foot screen (40' - 50').

3.0 OBJECTIVES

The objectives of this investigation are to collect essential data necessary to adequately assess site contamination, determine whether a significant threat to human health and the environment exists, and if there are continuing discharges to the subsurface from former contaminant incidences, address the comments and concerns of the regulatory agencies with regard to past investigations, and the aforementioned documented spills and violations.

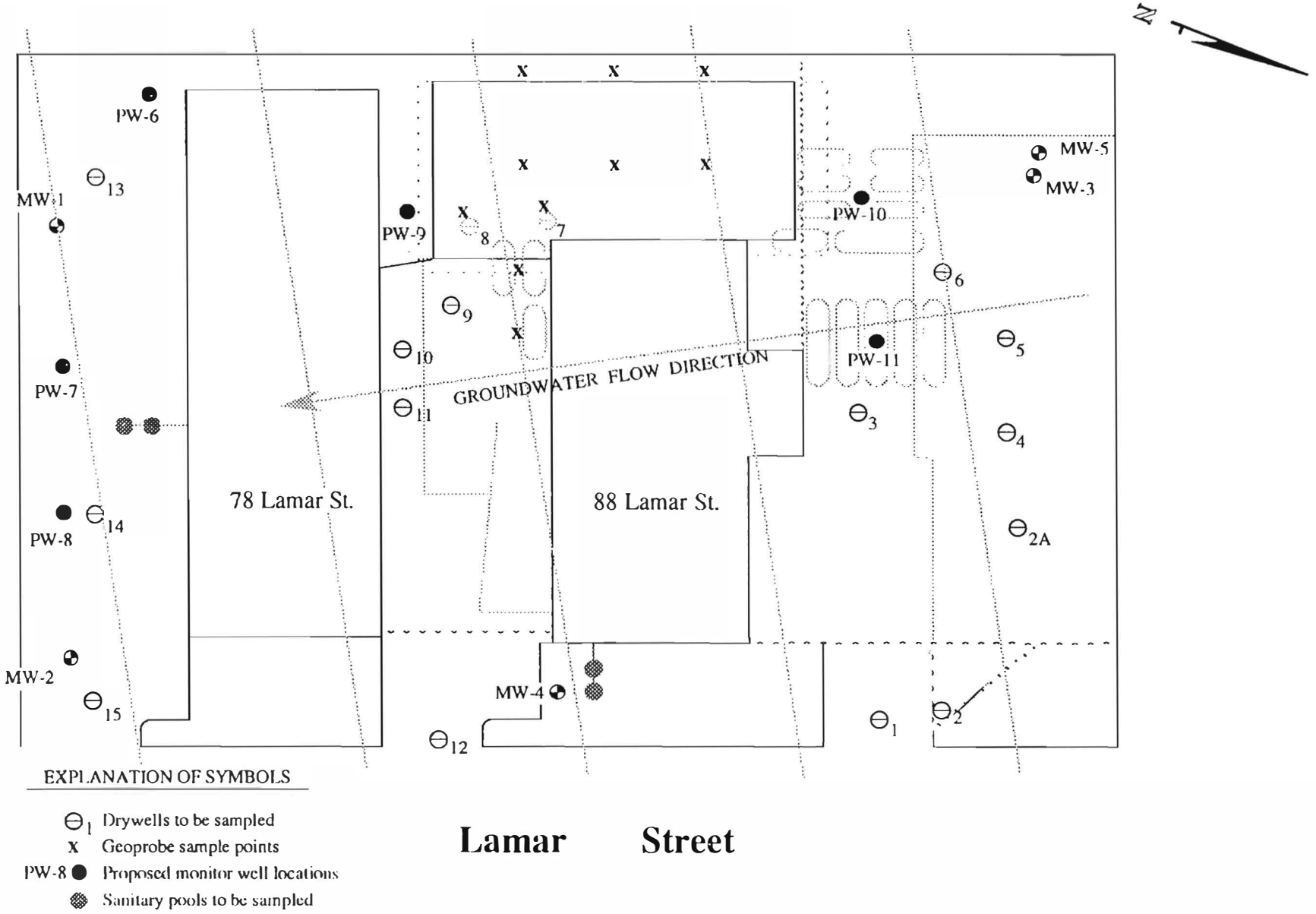
The following tasks will be performed in order to address the areas of concern at the facility. The proposed locations of borings, wells and sample collection are shown on Figure 6. The tasks are as follows;

3.1 - Investigation Tasks

1) SPDES violations and drywell contamination

It is proposed to collect a bottom sediment sample from each of the fourteen (14) drywell structures at the facility using a stainless steel hand auger assembly.

This equipment will be decontaminated prior to use in the field and between each sample point to avert the possibility of cross contamination. Decontamination procedures will be discussed in section 5.0 of this report.



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208 Route 109
Farmingdale, New York 11735

Figure 6 : Proposed Sample Locations

PRIDE SOLVENTS
78 - 88 Lamar Street
W. Babylon, New York

Drawn By: Rick Caputo
Date: 12 - 19 - 94
Scale: 1" = 40'

If levels of contaminants are found to be entrained in the bottom sludges of the drywells, they could be continually leaching out amounts of contaminants that are being detected in the ground water.

The samples collected from these pools will be submitted into the laboratory for analysis following Contract Laboratory Protocols (CLP) for volatiles and semi-volatiles via EPA methods 8260, 8270 and for total TCL metals (Section 4.0).

2) <u>The leaking (former) UST's</u>

A Central Mine Equipment (CME) 75 drill rig, capable of driving conventional and hollow stem augers to depths of 150 feet to 300 feet, is to be used to install two (2) monitoring wells, one (1) in each of the former underground storage tank farms along the northern portion of 88 Lamar Street.

During installation, split spoon samples are to be collected through the borehole at the water table interface (approximately ten (10) feet) in order to characterize the soils from the approximate bottoms of the former tanks. These boreholes will be completed to a final depth of approximately twenty (20) feet in order to accommodate the installation of ground water monitoring wells at these locations. Decontamination procedures, well installation and construction will be discussed later on in this document.

To address the tank farm along the southern portion of 88 Lamar Street, a Geoprobe rig will be utilized to install two (2) borings in this area.

The geoprobe is a vehicle mounted, hydraulically powered (2250 psi operating pressure), soil probing machine that utilizes static force (weight of the vehicle) and percussion to advance small diameter (1.375" O.D.) sampling tools into the subsurface for collecting soil core, soil gas, or ground water samples.

The geoprobe piston-type sampling equipment was specifically developed for use in the environmental industry and is capable of obtaining discretionary samples in the form of a 22" x 1-1/16" core contained inside a dedicated, removable, clear plastic (PETG) liner.

The first geoprobe on the market was purchased for EPA use in 1988. Among other governmental agencies using this technology are the Department of Energy, Department of the Interior, and the U. S. Geological Survey. Among the individual states that operate their own Geoprobe units are Kansas, Michigan, Connecticut, and Iowa.

The small size of this particular piece of drilling equipment allows for greater maneuverability and more versatility in placing sampling locations in restricted areas. Also, as the sampler is driven by application of weight and percussion, there are no cuttings generated during the sampling event.

In addition, with the use of various adapters, the same equipment can be driven by hand or rotary hammer hand drills affording this technology the versatility and capability of getting into very tight areas with virtually the only limiting factor being the soil types and depth to bedrock.

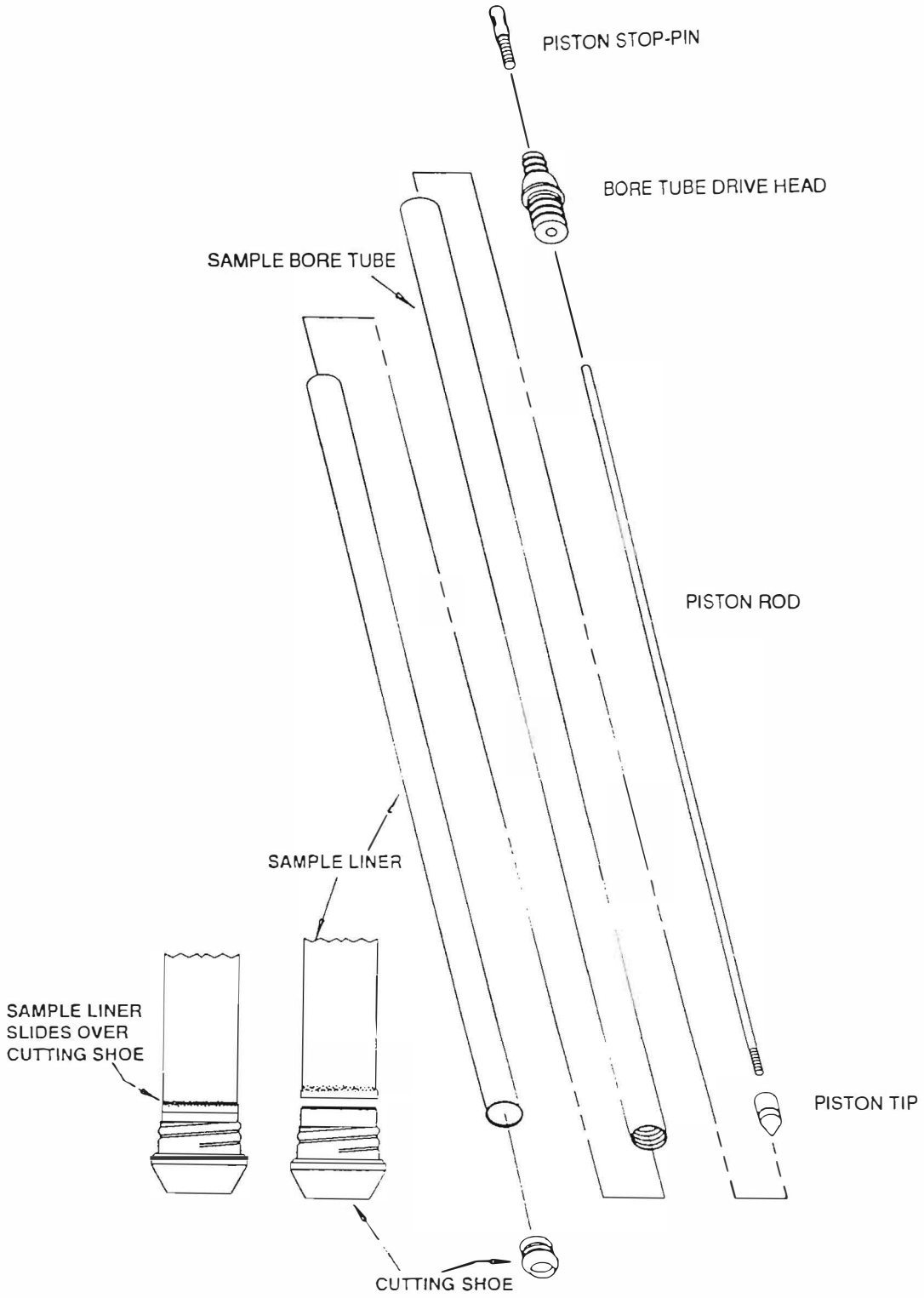
During the sampling procedure the bore sampler with PETG liner is assembled with a piston tip and connected to the end of a probe rod (Figure 7) and driven into the subsurface using the Geoprobe machine.

Additional probe rods are connected in succession to advance the sampler to depth. The sampler remains sealed by a piston tip as it is being driven, preventing any soils from being driven into the sample tube before the given interval is reached. The piston is held in place by a reverse threaded stop pin at the trailing end of the sampler.

When the sampler tip reaches the top of the desired sampling interval, a series of extension rods, sufficient to reach depth, are coupled together and lowered down the inside diameter of the probe rods. The extension rods are then rotated enabling the male threads on the leading end of the extension rods to engage the female threads on the top end of the stop pin, and the pin is removed.

After the extension rods and stop pin are removed, the tool string is advanced an additional twenty-four (24) inches for sample collection. The piston is displaced inside the bore sampler body by the soil as the sample is cut and automatically collected inside the PETG liner (Figure 8).

Samples will be collected at the water table interface at these two (2) locations as well. Samples collected will be analyzed following Contract Laboratory Protocols (CLP) for volatiles and semi-volatiles via EPA methods 8260, 8270 and for total TCL metals. Decontamination procedures to be utilized are detailed in Section 5.0.



Tyree Brothers Environmental Services, Inc. 208 Route 109 Farmingdale, New York 11735	FIGURE 7: Geoprobe Bore Sampler Pride Solvents 78 - 88 Lamar Street West Babylon, NY	Drawn By: Rick Caputo Date: 12 - 19 - 94

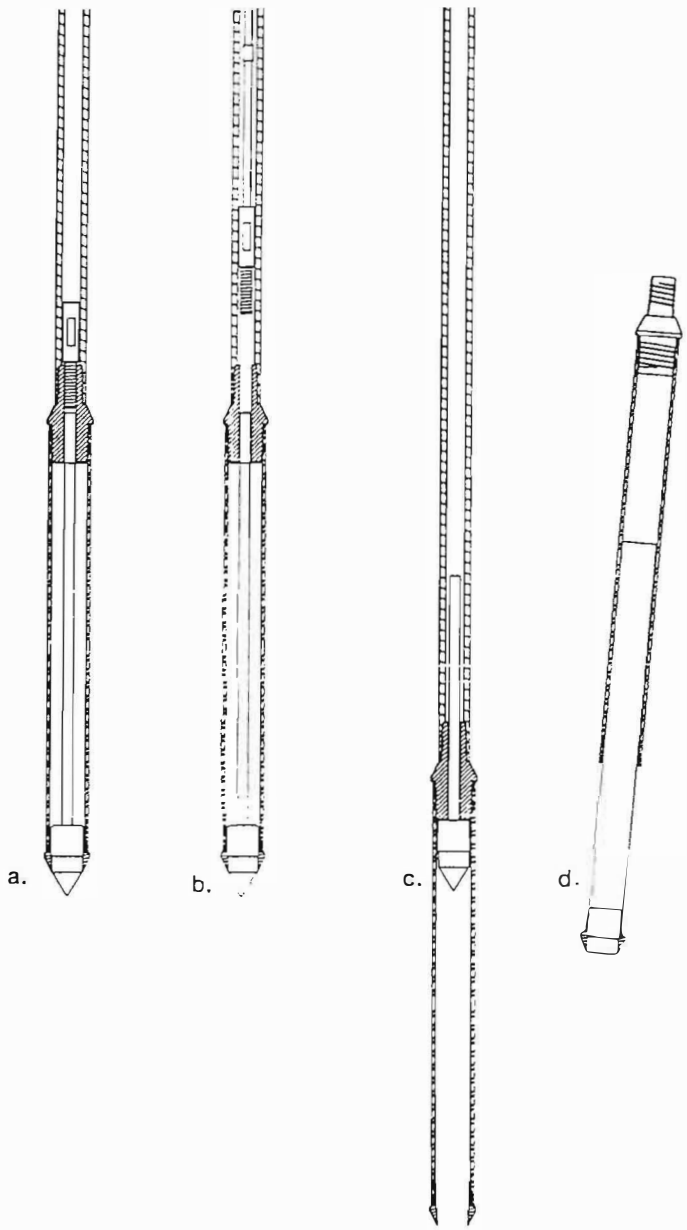


Figure 1. Driving and Sampling with the Large Bore Soil Sampler.
a. Driving the Sealed Sampler b. Removing the Stop-pin
c. Collecting a Sample d. Recovering Sample in Liner

Tyree Brothers Environmental Services, Inc. 208 Route 109 Farmingdale, New York 11735	FIGURE 8: Geoprobe Sample Retrieval Procedure Pride Solvents 78 - 88 Lamar Street West Babylon, NY	Drawn By: Rick Caputo Date: 12 - 19 - 94

3) The arson and forklift incidents

A stainless steel hand auger assembly is to be used to collect samples from the bottoms of drywells 9, 10, and 11 as described above (Item 1). These are the pools located in the immediate vicinity of the aforementioned fire and forklift incidents.

Samples collected will be analyzed following Contract Laboratory Protocols (CLP) for volatiles and semi-volatiles via EPA methods 8260, 8270 and for total TCL metals. Decontamination procedures to be utilized are detailed in Section 5.0.

4) The POCSA and drywells 7 & 8

As there is no specific incident or reference to a known spill that can be pinpointed in this area, a series of borings will be placed throughout the previous outside container storage area (POCSA). These borings will be placed using geoprobe equipment at thirty (30) foot intervals along the center line of the floor in this area.

The approximate locations of former drywells 7 and 8 are also within the currently enclosed container storage area (CSA). A boring will be placed in the vicinity of these former pools. This amounts to five (5) borings to be placed within the CSA (POCSA).

Additionally, there is an alley of approximately eight (8) foot in width, behind the enclosed portion of the building. Three (3) additional borings will be placed in this area to complete the characterization of the POCSA. This amounts to a total of eight (8) borings in or about the CSA or POSCA.

As construction activities for the enclosure of this area have undoubtedly resulted in the scraping, grading and other manipulation of soils prior to the pouring of the concrete floor, surficial samples just beneath the concrete flooring would not be representative of insitu conditions.

Therefore, these borings will be completed to a depth of approximately three (3) to five (5) feet in order to assess the possible past impacts to the subsurface from any incidental spills that may have occurred in this area while exposed to the elements.

The CME drill rig will be utilized to install a monitoring well to the south (downgradient) of the POCSA (CSA) to assess the impact, if any to the ground water from any past discharges that may have occurred in the area of the POSCA. No spilt spoon or soil samples will be collected from this location during the installation of this well.

Samples that are collected will be analyzed following Contract Laboratory Protocols (CLP) for volatiles and semi-volatiles via EPA methods 8260, 8270 and for total TCL metals. Decontamination procedures to be utilized are detailed in Section 5.0.

5) Other areas of suspect contamination

In order to appropriately address other concerns of the DEC with regard to the 1993 hydrogeologic report, several additional wells must be installed. These wells are proposed to be placed as follows; two (2) in the downgradient portion of the site along the property line, two (2) centrally located at the facility and two (2) further upgradient within the former tank fields as discussed above.

With the exception of the two (2) wells in the northernmost tank farm, there will be no soil samples collected for analysis from the installation of these wells. Well construction will be discussed later.

Furthermore, investigation into the sanitary pools is proposed to determine if they are possibly contributing to ground water contamination. Any materials that may have found their way into hand wash or slop sinks and or toilets would have a direct impact on the sanitary system of either building.

The discharge pools to each of the systems are to be located and all associated structures are to be sampled. The liquid phase and bottom sediments from each of the sanitary structures will be collected in order to determine if any impact has occurred.

The stainless steel hand augers will be used in order to retrieve soil/sludge samples from the bottoms of the sanitary discharge pools. Dedicated, disposable, polypropylene bailers, will be utilized to collect the liquid phase samples from all of the sanitary structures.

Samples collected will be analyzed following Contract Laboratory Protocols (CLP) for volatiles and semi-volatiles via EPA methods 8260, 8270 and for total TCL metals. Decontamination procedures to be utilized are detailed in Section 5.0.

3.2 - Well Installation and Construction

The borehole for placement of the monitoring wells will be drilled using hollow stem augers having an inside diameter of approximately eight (8) inches.

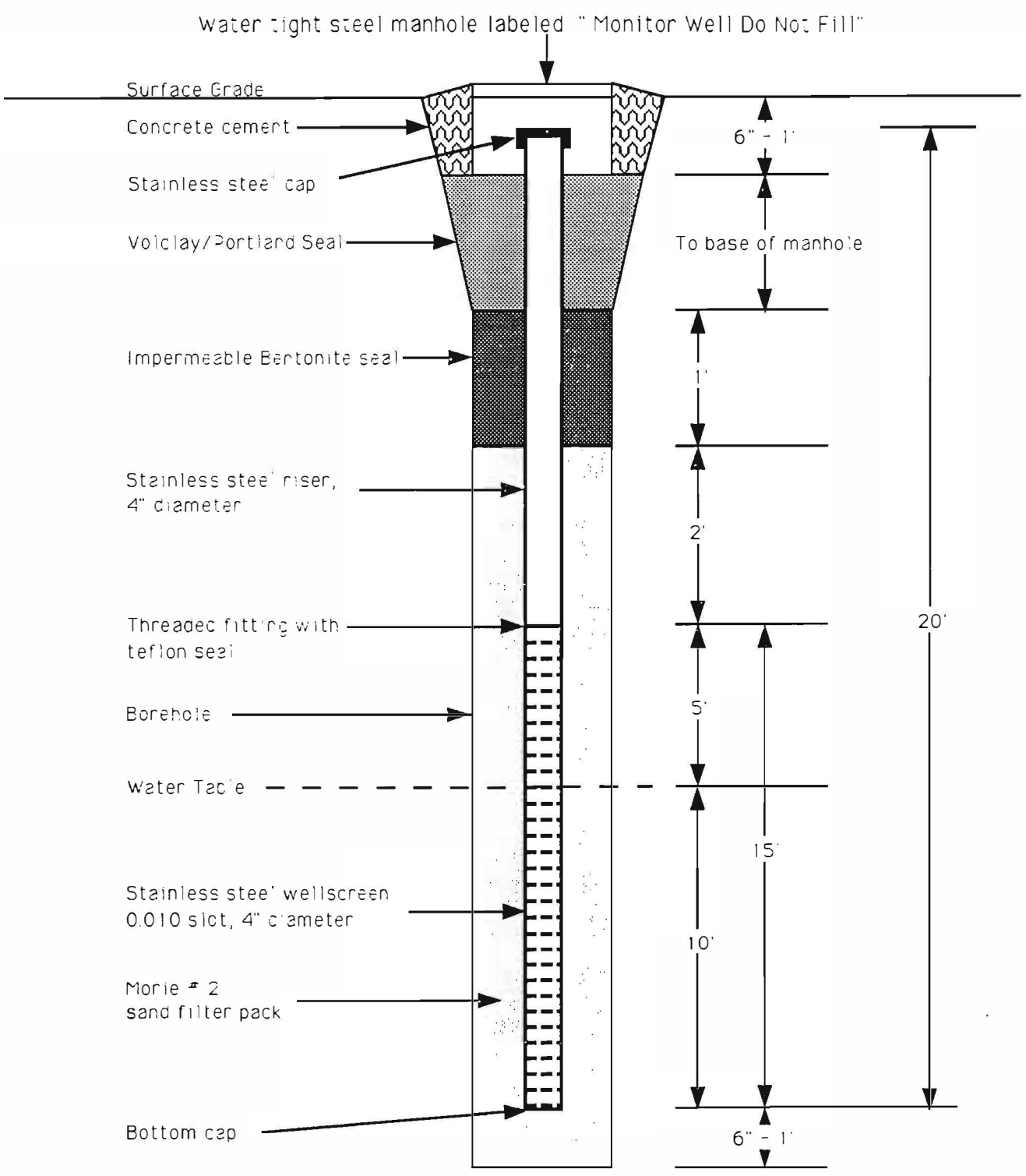
The monitoring well itself will be constructed of a four (4) inch diameter schedule 40, threaded, flush joint, stainless steel 304 solid pipe with fifteen (15) foot screened (.010 inch slot openings) interval at the bottom of the well. Approximately ten (10) foot of screen will penetrate the water table with five (5) feet above the interface to allow for natural fluctuations in the water table surface.

The borehole will be drilled directly to a depth of approximately twenty (20) feet. A morie number 2 gravel/sand pack will be placed around the well screen to a two foot level above the screen. A morie number 2 consists of particles ranging in size from 0.50 mm to 3.0 mm with an effective size of 1.42 mm and a uniformity coefficient of 1.22 mm.

A two (2) feet in thick seal will be established through use of bentonite pellets (3/8 to 1/2 inch diameter) placed above the screen packing. The remainder of the annular borehole space above the bentonite will be filled to grade with a bentonite grout. The monitoring wells will be finished at grade and be protected by a twelve (12) inch diameter cast iron frame and bolted down cover, cemented in place with a one and one-half foot square pad.

The well will be fitted with a water tight locking cap to avert the possibility of surface water infiltration. Figure 9 is a diagrammatic sketch of a typical ground water monitoring well construction planned for this investigation. Following well installation, the top of the well casing of each new well will be surveyed to a specified benchmark and subsequently tied into the monitoring well elevations of the five (5) existing wells at this location.

Typical Monitor Well Construction Diagram



Tyree Brothers Environmental Services, Inc. 208 Route 109 Farmingdale, New York 11735	FIGURE 9: Monitoring Well Construction Pride Solvents 78 - 88 Lamar Street West Babylon, NY	Drawn By: Rick Caputo Date: 12 - 19 - 94

These existing wells have been previously surveyed during the 1993 hydrogeologic investigation with respect to mean sea level and the monitoring well regime at the nearby Babylon Landfill location.

The new survey data acquired will be utilized to provide a more accurate depiction of the site specific ground water flow patterns associated with the site at the time of field activities being conducted under the scope specified herein.

Prior to performing any drilling, a site visit will be made to identify buried power lines, underground gas lines, water mains, and sanitary and storm sewers in the area. The appropriate utilities will be contacted in advance to obtain markouts. Necessary precautions will be exercised by the drilling crew with respect to overhead or underground utilities. Also, prior to arrival onsite and between sampling locations, all hollow stem augers and soil boring equipment will be steam cleaned to avoid cross contamination.

All drill cuttings will be properly contained in 55 gallon, DOT approved 17-H open head drums. These drums will be appropriately labeled as to their contents and temporarily stored on site until analytical results are received and proper disposal arrangements can be made.

3.3 - Well Development

Once installed, the wells must be properly developed, purged and sampled in accordance with the previous sampling and analytical requirements in order that a correlative evaluation can be made with regard to actual ground water conditions beneath the site. A minimum of two (2) days will be allowed for the grout seal and cement to set prior to developing the well.

The wells will first be monitored for depth to water (DTW), total depth (TD) and for the presence of liquid phase hydrocarbons (LPH) or sheens using a standard sonic interface probe. The DTW and TD measurements will also be used to determine the volume of standing water in each of the wells.

Development of the well is to be accomplished by using a submersible "Grundfos" Redi-Flo2, model MP-1 submersible pump. This pump is constructed of all stainless steel with teflon and viton seals to guard against contamination. The discharge hose is to be constructed of tygon® or its equivalent. A dedicated length of hose will be supplied for each of the five (5) new wells in order to avert cross contamination and to eliminate the manpower, time and materials necessary, as well as wastes generated from decontamination procedures.

The interior and exterior of the pump will be decontaminated in house prior to field use and insertion into the wells, using a microwash solution. The interior of the pump will be rinsed by pumping a minimum of five (5) gallons of potable water through it. The exterior portion of the pump will then be steam cleaned and wrapped in new visqueen in order to protect it from contaminants prior to use. During pumping, the pump is to be worked up and down along the screened interval to ensure uniform development of the well screen. Water clarity will be visually checked to evaluate development progress. Pumping of the wells will be conducted until the well yields a clean, sand and silt-free discharge.

Turbidity measurements will be taken with a portable nephelometer during development to ensure that a turbidity of 50 nephelometric turbidity units (NTU's) or less is achieved

Turbidity measurements will be taken with a LaMatte model 2008 turbidimeter. The instrument will be calibrated prior to field measurements using manufacturer supplied standards which are guaranteed to be accurate to within plus or minus 1%.

All effluent purge water will be properly contained in 55 gallon, DOT approved 17-H open head drums. These drums will be appropriately labeled as to their contents and temporarily stored on site until analytical results are received and proper disposal arrangements can be made.

4.0 - SAMPLING AND ANALYSIS

All samples will be submitted for laboratory analysis to Quanterra Incorporated, Environmental Services (formerly International Technologies Corp.). This laboratory was specified and previously approved by the NYSDEC for use on this project for the 1993 assessment.

Quality assurance/quality control (QA/QC) samples submitted will include a matrix spike (MS), matrix spike duplicate (MSD), blind duplicate, field and trip blanks for each sample matrix (soil/water) for each daily sampling event. All field blank vials are to be filled by pouring laboratory prepared distilled water over the field decontaminated equipment following sampling and collecting the runoff in the appropriate laboratory supplied vials. Trip blanks will be supplied by the laboratory.

Trip and field blanks shall be tested for all parameters to check for possible cross contamination due to sampling equipment or encountered during transport. All samples will be uniquely identified and information associated with each sample is to be recorded on the container labels and the chain of custody documents.

The sample containers slated for laboratory analysis will be immediately placed on ice and kept cool until delivered to the laboratory. Chain of custody documents will be kept with all samples bound for delivery to the laboratory.

4.1 - Soil Sampling

All of the split spoon and geoprobe soil samples will be opened with minimal disturbance, immediately containerized with no head space and placed on ice for shipment to the laboratory.. The remaining soils from the split spoons and boreholes will be containerized in a 55 gallon DOT approved drums. These drums will be temporarily stored onsite until laboratory analysis is received and proper disposal could be arranged.

4.2 - Ground water Sampling

Sampling of the monitoring wells will be conducted no sooner than two (2) days following completion of development. Prior to obtaining any ground water samples from the well, a minimum of three (3) to five (5) well volumes will be removed. Samples will be collected with dedicated stainless steel bailers affixed with dedicated polypropylene monofilament lines.

A sample of the ground water from the first bailer will be placed in a clean container to measure field parameters of temperature, pH, salinity, turbidity and specific conductivity. These measurements will be collected using a Horiba U-10 water quality meter which will be calibrated according to manufacturers standards prior to use in the field. This will be the same type instrument utilized in the 1993 field sampling event.

The water quality meter is that which was utilized for measurement of field parameters during the 1993 sampling event.

Pertinent information on the specifications of this instrument appear in Appendix I of this work plan. Field measure of the parameters listed above will also be collected following the removal of the third and fifth well volumes in order to ensure stability of water quality in the well prior to collection of ground water samples.

5.0 - Decontamination Procedures

Prior to drilling the soil borings and installing the monitoring well, all of the drilling rig and drilling equipment will be decontaminated, before mobilization and drilling, with the use of a steam cleaner. Any used hollow stem auger will be steam cleaned prior to being reused to avoid cross contamination of collected soil samples.

All split spoon, geoprobe and hand sampling equipment will be decontaminated prior to use and between sampling locations using procedures described below:

* Steam clean OK
* Scrub with a brush and microwash OK
* Distilled water rinse
* Thorough rinse with laboratory grade methanol
* Scrub with a brush and microwash
* Distilled water rinse
* Thorough rinse with laboratory grade methanol
* Total air dry

6.0 - REPORT PREPARATION

A detailed report summarizing all of the work tasks and findings will be generated following the receipt of all analytical results and manifests. This report will be submitted to the client for subsequent submittal to the appropriate regulatory agencies and contacts for review.

7.0 - HEALTH AND SAFETY PLAN

Based upon a review of available information for this site, and previous investigation, level D personnel protection appears to be adequate to conduct this investigation.

However, during certain phases level C may be employed. The site will be continuously monitored during field operations as previously indicated in order to provide adequate protection of all personnel on site. The following HASP (Attachment I) has been prepared for the anticipated work scope and contaminants to be encountered at the site. A listing of the products stored as well as the compounds detected during the 1993 assessment are included as Attachment II of the HASP.

ATTACHMENT I

HEALTH AND SAFETY PLAN

SITE SPECIFIC SAFETY AND HEALTH PLAN
For Other Than Gasoline

SECTION 1: GENERAL INFORMATION & ACKNOWLEDGMENTS

CLIENT NAME: PRIDE SOLVENTS PROJECT NAME: SAME

PROJECT MANAGER: RICK CAPUTO JOB NUMBER: 94

SITE SUPERINTENDENT: N/A REVISION: N/A

SITE HEALTH & SAFETY OFFICER: TO BE APPOINTED AT TIME OF JOB

PREPARED BY : RICK CAPUTO DATE: 12/20/94

SHORT FORM APPROVED BY: DATE:

Health & Safety Manager: JOSEPH MAZZUCCO —

Project Manager: RICK CAPUTO —

Site Superintendent: NOT AS YET APPLICABLE —

SECTION 2: PROJECT INFORMATION

1. WILL POTENTIAL HAZARDS TO ON-SITE PERSONNEL EXIST? (YES OR NO)

Physical: YES (If yes, see Section 3)

Chemical: YES (If yes, see Section 4)

Confined Space Entry: No (If yes, see Section 6)

2. SITE INFORMATION:

Site Name: PRIDE SOLVENTS Site Contact:

Address: 78-88 LAMAR STREET Telephone:

W. BABYLON

3. SITE CLASSIFICATION: (Check all that apply)

___	Hazardous (RCRA)	___	Hazardous (CERCLA)	X	Other
___	Construction	___	UST/LUST	X	Active
___	Sanitary Landfill	___	Manufacturing	___	Inactive

4. PURPOSE AND DATE(S) OF FIELD VISIT(S): PHASE II ENVIRONMENTAL ASSESSMENT

5. TASKS: Soil Borings, Monitor Well Installation, Ground Water Sampling

6. ON-SITE ORGANIZATION:

Tyree Personnel	Responsibilities
To be determined prior	to actual field work at site

NOTE: Identify on-site Supervisor with an asterisk (*).

NOTE: This Site Safety Plan has been prepared for use by Tyree employees. Tyree claims no responsibility for its use by others. The plan is written for the specific site conditions, purposes, dates and personnel specified and must be amended if these conditions change.

Contractors and subcontractors whose work will be performed on-site, or who otherwise could be exposed to health and safety hazards, will be advised of known hazards through distribution of site information obtained by Tyree from others and this Site Safety Plan (SSP). They shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. All contractors and subcontractors are responsible for: 1) Providing their own personal protective equipment; 2) Training their employees in accordance with applicable Federal, State and local laws; 3) Providing medical surveillance and obtaining medical approvals for their employees; 4) Ensuring their employees are advised of and meet the minimum requirements of this SSP and any other additional measures required by their site activities and 5) Designating their own Site Safety Officer.

7. BACKGROUND INFORMATION: (Attach existing description and map, if available)

As per Hydrogeological Investigation (June 1993) and Phase II Investigation Work Plan (December 1994)

SECTION 3: PHYSICAL HAZARDS INFORMATION

1. IDENTIFY POTENTIAL PHYSICAL HAZARDS TO WORKERS:

___ Confined Space	___ Steep/Uneven Terrain	___ Surface Waters
X Heavy Equipment	___ Heat Stress	X Drum Handling
X Moving Parts	___ Extreme Cold	X Noise

Describe other unsafe environments ___

2. PROTECTIVE EQUIPMENT REQUIRED? Yes (X) No ( )

If yes, complete Section 8.

3. SAFETY EQUIPMENT REQUIRED:

____ Harnesses	____ Stretcher	____ Lights
____ Explosimeter	X Eye Wash	____ Lights - Emergency
____ Blower	____ Shower	X Safety Cones
____ Lifeline	X Barrier Tape	X Communications: On-site
____ Ladder	X Fire Extinguisher	____ Communications: Off-site
X First Aid Kit	X Emergency Air Horn	____ Traffic Vest
____ SCBA	____ Full Body Harness	

Describe other _____

4. See Section 9 for additional safe work practices.

SECTION 4: CHEMICAL HAZARDS INFORMATION

1. IDENTIFIED CONTAMINANTS:

Known or suspected hazardous/toxic materials (Attach tabulated data, if available).

Media	Substances Involved	Characteristics	Estimated Concentrations
GW	As	UN	As
SL	PER	UN	PER
SD	Attachment II	UN	Attachment II

Media Types: GW (ground water), SW (surface water), WW (wastewater), AI (air), SL (soil), SD (sediment), LE (leachate), WA (waste), OT (other), WL (waste, liquid), WS (waste, solid), WD (waste, sludge), WG (waste, gas)

Characteristics: CA (corrosive, acid), CC (corrosive, caustic), IG (ignitable), RA (radioactive), VO (volatile), TO (toxic), RE (reactive), UN (unknown), OT (other, describe)

2. DESCRIBE POTENTIAL HAZARDS FOR EACH MEDIA TYPE:

DEPENDANT UPON SOLVENT TYPE THAT MAY BE ENCOUNTERED, TO INCLUDE BUT NOT LIMITED TO ODORS, VAPORS, SKIN IRRITATION

3. OVERALL SITE HAZARD LEVEL:

____ Serious ____ Moderate X Low ____ Unknown

5. SITE MONITORING REQUIRED? Yes (X) No ( )

If yes, identify monitoring equipment below:

____ HNU Meter (Lamp ____ eV)	____ Geiger Counter
____ Explosimeter	____ Respirable Dust Monitor
____ Organic Vapor Analyzer (OVA)	_X_ Other

Describe Other MICROTIP PID

Monitoring equipment is to be calibrated according to manufacturer's instructions. Record measured levels in log book.

Describe method of surveillance (e.g., continuous, periodic, etc.). Indicate action levels and PPE required (total vapors, oxygen, LEL, radiation, other).

PERIODIC MONITORING

PPE will VARY AS SITE CONDITIONS DICTATE.

6. PROTECTIVE CLOTHING REQUIRED? Yes (X) No ( )

If yes, complete protective equipment form (Section 8).

7. RESPIRATORS REQUIRED? Yes ( ) No ( ) PENDING

If yes, complete Section 8 and respirator log (Attachment 2).

SECTION 5: HAZARD COMMUNICATION PROGRAM

Each chemical used at the site shall have a Material Safety Data Sheet (MSDS) and be available for review by all field personnel. The company's written HAZCOM Program shall be available at all times with the MSDS. Training shall be performed whenever a new chemical is introduced at the site. Signatures for the training shall be documented on the Daily Toolbox Meeting form.

SECTION 6: CONFINED SPACE ENTRY

1. WILL CONFINED SPACE ENTRY TAKE PLACE? Yes ( ) No (X)

If yes, complete Attachment 1, the Confined Space Entry Permit, prior to entering each confined space, each work shift. The Confined Space Permit must be posted outside the confined space. A copy of the company's written Confined Space Procedure is on-site with the written HAZCOM Program. (See Site Supervisor.)

SECTION 7: SITE EMERGENCY PLAN

Your Location Address: PRIDE SOLVENTS
78 & 88 LAMAR St, W. BABYLON, N.Y.

Telephone Located at: INSIDE EITHER BUILDING

Emergency Phone Numbers:

Ambulance: (911) 911 OR 249-0047
Fire: (911) 911 OR 249-0047
Police: (911) 911

Poison Control: 542-2323

Hospital: BRUNSWICK HOSPITAL
366 BROADWAY, Amityville N.Y. (516) 789-7500

Directions: LAMAR St. SOUTH to EDISON AV. EAST TO HOLLYWOOD AV. SOUTH to Southern State Parkway WEST TO Route 110 South, continue South for Approximately 2 mi Hospital on right

FIRST AID

Ingestions: Give water if patient is conscious. Call Poison Control and follow instructions. Administer CPR, if necessary. Seek medical attention.

Inhalation: Remove person from contaminated environment. Administer CPR, if necessary. Seek medical attention.

Skin Contact: Brush off dry material and remove contaminated clothing. Wash skin with soap and water. Seek medical attention if irritation develops.

Eye Contact: Flush eyes and surrounding tissue with water for 15 minutes. Seek medical attention.

- Exposure Symptoms: Headache, dizziness, nausea, drowsiness, irritation of eyes, nose, throat and breathing difficulties.

Report incident to Project Manager and Regional Health and Safety Manager after emergency procedures have been implemented.

THE HOME OFFICE:

The following person(s) is/are available for assistance or guidance at all times and can be contacted at the Home Office during working hours at (516) 249-3150; after 5:00 p.m. as follows:

J. P. Mazzurco, Safety Manager - (914) 469-9386

Sky Pager
Numeric Message

- Dial 1-800-SKY-PAGE
  1-800-759-7243

- Enter PIN 279-9817, press #

- Enter numeric message or telephone number, press #

- Confirm message, press #

- Cancel message, press #

- For help, call SkyTel
  1-800-SKY-USER

SECTION 8: PROTECTIVE EQUIPMENT LIST

NAME	MEDICAL CURRENT (DATE)	40 HR/8 HR TRAINING (DATE)	CONSTR. TRAINING (DATE)	FIT TEST CURRENT (INCLUDE TYPE & DATE)
PENDING SET UP OF ACTUAL WORK Activities				

TASK	RESPIRATORS & CARTRIDGE*	CLOTHING	GLOVES	BOOTS	OTHER
Drilling	C/O	C/T	L	S/L	H/G
Boring	C/O	C/T	L	S/L	H/G
Soil Sampling	C/O	C/T	T	S/L	H/G
GW Sampling	D	C/T	T	S/L	G
Surveying	D	C/T	N/A		N/A
Drum Disposal	D	C/T	L	S	N/A

RESPIRATORS	CARTRIDGE	CLOTHING	GLOVES	BOOTS	OTHER
B = SCBA	O = Organic Vapor	T = Tyvex	B = Butyl	F = Firemans	F = Face Shield
C = Resp.	G = Organic Vapor & Acid Gas	P = PE Tyvek	L = Latex	L = Latex	G = Goggles
D = N/A	A = Asbestos (HEPA)	S = Saranex	N = Neoprene	N = Neoprene	L = Glasses
E = Escape	P = Particulate	C = Coveralls	T = Nitrile	S = Safety	H = Hard Hat
	C = Combination Organic Vapor & Particulate		V = Viton		

* Action levels for upgrade/downgrade N/A

SECTION 9: SAFE WORK PRACTICES

THE FOLLOWING WORK PRACTICES MUST BE FOLLOWED BY PERSONNEL ON-SITE.

1. Smoking, eating or drinking are forbidden.
2. Ignition of flammable liquids within or through improvised heating devices (e.g., barrels) is forbidden.
3. Contact with samples, excavated materials or other contaminated materials must be minimized.
4. Do not kneel on the ground when collecting samples.
5. If drilling equipment is involved, know where the "kill switch" is.
6. All electrical equipment must be plugged into ground fault interrupter (GFI) protected outlets.
7. COMPLETE DAILY TOOLBOX SAFETY MEETING FORM - NEXT PAGE.

SECTION 10: EMPLOYEE ACKNOWLEDGMENTS

I acknowledge that I have reviewed the information of this Site Safety Plan. I understand the site hazards as described and agree to comply with the contents of this plan.

EMPLOYEE (print)	SIGNATURE	DATE
PENDING		
ACTUAL		
JOB		
SET		
UP		

DAILY TOOLBOX SAFETY MEETING

Date: _____ Weather/Temp: _____

Foreman: _____

Topics of Safety Meeting:

[ ] Hardhats & Safety Shoes

[ ] Eye & Ear Protection

[ ] Work Zones & Site Control

[ ] Heat & Cold Stress

[ ] Designated Smoking Zone

[ ] Previously Occurring Accidents

[ ] Accident Reporting

[ ] Other: _____

[ ] Ladders for Excavations

[ ] Entering Excavations

[ ] Confined Space Entry

[ ] Ground Fault Interrupters

[ ] Location of First Aid Kit
Fire Extinguishers & Phone Numbers

[ ] HAZCOM Training

Signatures:

Tyree Employees	Subcontractors & Visitors
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Notes From Daily Activities: _____

Superintendent Signature _____

Tyrec Environmental Technologies

ATTACHMENT II

PRODUCT STORAGE AND CONTAMINANT ANALYTES DETECTED

BULK MATERIAL

Tyree Environmental Technologies

TANK NO. & PRODUCT		GALLONS
1	XYLOL (dimethylbenzene) (a)	3000 (1)
2	VM&P (naptha)	3000 (1)
3	LAKTANE (mixture C7-Cg) (A)	3000 (1)
4	VARSOL 3 (stoddard solvent) (C)	3000 (1)
5	METHANOL (methyl alcohol) (A)	3000 (1)
6	AROMATIC 100 (C)	3000 (1)
7	EMPTY	3000 (1)
8	DIESEL FUEL (C)	3000 (1)
9	GASOLINE (A)	3000 (1)
10	LOPS (aliphatic solvent) (C)	5000 (1)
11	TOLUOL (methyl benzene) (A)	6000 (1)
12	ACETONE (dimethyl ketone) (A)	6000 (1)
13	150 ALCOHOL (isopropyl alcohol) (A)	6000 (1)
14	MEK (methyl ethyl ketone) (A)	6000 (1)
15	VARSOL #18 (stoddard solvent) (C)	6000 (1)
16	VARSOL #1 (stoddard solvent) (C)	6000 (1)
17	RECLAIMED CYCLOTHANE (1,1,1-trichloroethane) (B)	5000 (2)
18	METHYLENE CHLORIDE (B)	5000 (2)
19	PERCHLOROETHYLENE (Tetrachloroethylene) (B)	5000 (2)
20	TRICHLOROETHYLENE (B)	5000 (2)
21	CHLORO-SM (1,1,1-trichloroethane) (B)	5000 (2)
22	RECLAIMED (1,1,1-trichloroethane) (B)	5000 (2)
23	RECLAIMED (trichloroethylene) (B)	5000 (2)
24	DOW DM (methyl carbitol diethylene glycol methyl ether) (C)	5000 (2)
25	FREON (fluorinated solvent) (B)	5500 (2)

NOTES: (A) flammable (B) non-flammable (C) Combustible
(1) Outside storage, below grade (2) Inside storage, above grade

DRUM STORAGE

Tyree Environmental Technologies

CHEMICAL	DRUMS
Acetone	11
1,1,1-Trichloroethane	25
Anti-freeze	4
Aromatic 150	4
NButyl Acetate	1
Sec.Butyl Alcohol	0
Carbon Tetrachloride	0
Diacetone Alcohol	0
Dibutyl Phthalate	0
Diethanolamine	3
Diethylene Glycol	1
Diethylene Triamine	0
Diisopropanolamine	0
Dioctylyphthalate	1
Dipropylene Glycol	10
Dowanol PM	3
Dowanol EB	3
Versene 100 Liquid	3
EE Acetate	4
Ethyl Acetate 99	7

Table 6:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
B-1 (6'-8')					
VOA's					
Methylene Chloride	Z2211	98	1.0	BJ	4
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1266	342	33.3	J	120
Di-n-octyl phthalate	N1266	342	33.3	BJ	52
Metals					CONCENTRATION (ppm)
Aluminum	F30406601D	806	-	*	924
Chromium	F30406601D	806	-	-	3.3
Iron	F30406601D	806	-	*	2450
Lead	F30406601D	806	-	N*	1.2
Manganese	F30406601D	806	-	-	278
Zinc	F30406601D	806	-	-	6.9

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 7:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
B-2 (4'-6')					
VOA's					
Methylene Chloride	Z2214	106	1.0	BJ	4
1,1,1 Trichloroethane	Z2214	106	1.0	J	5
Tetrachloroethene	Z2214	106	1.0	-	17
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1267	364	33.3	BJ	76
Di-n-octyl phthalate	N1267	364	33.3	J	78
Metals					CONCENTRATION (ppm)
Aluminum	F30406604D	807	-	*	3460
Calcium	F30406604D	807	-	-	3900
Chromium	F30406604D	807	-	-	4.5
Iron	F30406604D	807	-	*	4040
Lead	F30406604D	807	-	N	6.1
Magnesium	F30406604D	807	-	-	2150
Manganese	F30406604D	807	-	N*	65.2
Zinc	F30406604D	807	-	-	11.2

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 8:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
B-3 (6'-8')					
VOA's					
Methylene Chloride	Z2215	116	1.0	BJ	9
Tetrachloroethene	Z2215	116	1.0	J	4
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1268	393	32.9	J	250
Di-n-octyl phthalate	N1268	393	32.9	BJ	73
Metals					CONCENTRATION (ppm)
Aluminum	F30406605D	808	-	*	2190
Calcium	F30406605D	808	-	-	2100
Chromium	F30406605D	808	-	-	3.7
Iron	F30406605D	808	-	*	4730
Lead	F30406605D	808	-	N	3.2
Magnesium	F30406605D	808	-	-	1420
Manganese	F30406605D	808	-	N*	90.9
Zinc	F30406605D	808	-	-	9.4

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 9:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
Blind Duplicate (B-3) (6'-8')					
VOA's					
Methylene Chloride	Z2217	134	1.0	BJ	10
Tetrachloroethene	Z2217	134	1.0		85
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1270	455	33	J	77
Di-n-octyl phthalate	N1270	455	33	BJ	48
Metals					CONCENTRATION (ppm)
Aluminum	F30406607D	810	-	*	1930
Calcium	F30406607D	810	-	-	20300
Chromium	F30406607D	810	-	-	4.1
Iron	F30406607D	810	-	*	5520
Lead	F30406607D	810	-	N	4.6
Magnesium	F30406607D	810	-	-	9660
Manganese	F30406607D	810	-	N*	92.5
Zinc	F30406607D	810	-	-	7.3

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 10:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
B-4 (6'-8')					
VOA's					
Methylene Chloride	Z2228	125	1.0	BJ	7
Toluene	Z2228	125	1.0	J	1
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1269	426	33.2	J	180
Di-n-octyl phthalate	N1269	426	33.2	BJ	110
Metals					CONCENTRATION (ppm)
Aluminum	F30406606D	809	-	*	1580
Chromium	F30406606D	809	-	-	3.2
Iron	F30406606D	809	-	*	2560
Lead	F30406606D	809	-	N	1.5
Manganese	F30406606D	809	-	N*	35.6
Zinc	F30406606D	809	-	-	10.7

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 11:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
Field Blank					
VOA's					
Chloroform	K7962	70	1.0	BJ	3
2 - Butanone	K7962	70	1.0	J	4
1,2 - Dichloropropane	K7962	70	1.0	J	2
Semi-VOA's					
Di-n-Butylphthalate	N1247	617	1.0	J	2
Bis (2-Ethylhexyl) phthalate	N1247	617	1.0	BJ	6
Di-n-octyl phthalate	N1247	426	1.0	BJ	4
Metals					CONCENTRATION (ppm)
None Reportable	F30406702D	811	-	-	-

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 12:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
Blank Soil					
(Laboratory Soil)					
VOA's					
Methylene Chloride	Z2210	80	1.0	BJ	3
Acetone	Z2210	80	1.0		36
Semi-VOA's					
Dimethyl Phthalate	N1279	640	33.2	J	24
Diethylphthalate	N1279	640	33.2	J	120
Di-n-Butylphthalate	N1279	640	33.2	J	60
Bis (2-Ethylhexyl) phthalate	N1279	640	33.2	J	60
Di-n-octyl phthalate	N1279	640	33.2	BJ	47
Metals					CONCENTRATION (ppm)
Not Analyzed	-	-	-	-	-

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 13:
Borehole Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
Trip Blank (Laboratory Water)					
VOA's					
1,2 - Dichloropropane	K7961	90	1.0	J	1
Semi-VOA's					
Not Analyzed	-	-	-	-	-
Metals					CONCENTRATION (ppm)
Not Analyzed	-	-	-	-	-

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 14:
Surficial Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
S-1					
VOA's					
Methylene Chloride	Z2218	143	1.0	BJ	11
Semi-VOA's					
Phenanthrene	N1271	488	33	J	60
Fluoranthene	N1271	488	33	J	78
Pyrene	N1271	488	33	J	68
Butylbenzyl-phathalate	N1271	488	33	J	39
Chrysene	N1271	488	33	J	43
Bis (2-Ethylhexyl) phthalate	N1271	488	33	J	400
Di-n-octyl phthalate	N1271	488	33	BJ	108
Metals					CONCENTRATION (ppm)
Aluminum	F30406608D	812	-	*	1180
Calcium	F30406608D	812	-	-	2350
Chromium	F30406608D	812	-	-	5.9
Copper	F30406608D	812	-	-	12
Iron	F30406608D	812	-	*	5550
Lead	F30406608D	812	-	N	38.3
Manganese	F30406608D	812	-	N*	42.1
Nickel	F30406608D	812	-	-	10.8
Zinc	F30406608D	812	-	-	74.2

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 15:
Surficial Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
S-2					
VOA's					
Methylene Chloride	Z2219	151	1.0	BJ	9
Tetrachloroethene	Z2219	151	1.0	-	99
Semi-VOA's					
Phenanthrene	N1272	526	32.9	J	35
Fluoranthene	N1272	526	32.9	J	71
Pyrene	N1272	526	32.9	J	93
Benzo(a)Anthracene	N1272	526	32.9	J	56
Chrysene	N1272	526	32.9	J	59
Bis (2-Ethylhexyl) phthalate	N1272	526	32.9	J	130
Di-n-octyl phthalate	N1272	526	32.9	BJ	57
Benzo(b)fluoranthene	N1272	526	32.9	J	38
Benzo(k)Fluoranthene	N1272	526	32.9	J	47
Benzo(a)pyrene	N1272	526	32.9	J	48
Indeno(1,2,3-cd) Pyrene	N1272	526	32.9	J	36
Benzo(g,h,i) Perylene	N1272	526	32.9	J	37
Metals					CONCENTRATION (ppm)
Aluminum	F30406609D	813	-	*	1270
Chromium	F30406609D	813	-	-	6.3
Iron	F30406609D	813	-	*	4120
Lead	F30406609D	813	-	N	1.8
Manganese	F30406609D	813	-	N*	33.3
Zinc	F30406609D	813	-	-	10.5

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 16:
Surficial Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
S-3					
VOA's					
Methylene Chloride	Z2220	160	1.0	BJ	9
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1273	564	33	J	60
Di-n-octyl phthalate	N1273	564	33	BJ	69
Metals					CONCENTRATION (ppm)
Aluminum	F30406610D	814	-	*	1200
Iron	F30406610D	814	-	*	3000
Lead	F30406610D	814	-	N	0.92
Manganese	F30406610D	814	-	N*	51.1

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 17:
Surficial Soil Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUALIFIER	CONCENTRATION (ppb)
S-4					
VOA's					
Methylene Chloride	Z2221	61	1.0	B	11
Semi-VOA's					
Bis (2-Ethylhexyl) phthalate	N1278	590	33	J	42
Di-n-octyl phthalate	N1278	590	33	BJ	48
Metals					CONCENTRATION (ppm)
Aluminum	F30406701D	815	-	*	4090
Chromium	F30406701D	815	-	-	3.9
Iron	F30406701D	815	-	*	3570
Lead	F30406701D	815	-	N	4.3
Manganese	F30406701D	815	-	N*	51.5
Zinc	F30406701D	815	-	-	7.5

Qualifiers; * - Duplicate analysis not within control limits,
N - Matrix spike sample recovery not within control limits,
B - In Blank, D - Dilution, J - Estimated

Table 18:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND!	CONC. (ppb)
MW-1						
VOA's						
Vinyl Chloride	K7969	65	1.0	-	2	65
Methylene Chloride	K7969	65	1.0	J	5	4
Carbon Disulfide	K7969	65	1.0	J	50	8
1,1 Dichloroethane	K7969	65	1.0	-	5	33
1,2 Dichloroethene	K8057	132	25	D	5	2400
Chloroform	K7969	65	1.0	BJ	7	3
1,1,1 Trichloroethane	K8057	132	25	D	5	540
Trichloroethene	K7969	65	1.0	J	5	8
Tetrachlorethene	K7969	65	1.0	-	5	15
Toluene	K8057	132	25	D	5	940
Chlorobenzene	K7969	65	1.0	J	5	1
Ethylbenzene	K7969	65	1.0	-	5	52
o,m,p, Xylenes	K7969	65	1.0	-	5	130
Semi-VOA's						
1,3 Dichlorobenzene	N1248	360	1.0	-	5	20
1,4 Dichlorobenzene	N1248	360	1.0	-	5	90
1,2 Dichlorobenzene	N1248	360	1.0	-	5	11
1,2,4 - Trichlorobenzene	N1248	360	1.0	-	5	140
Di-n-Butylphthalate	N1248	361	1.0	J	50	3
Bis (2-Ethylhexyl) phthalate	N1248	361	1.0	BJ	50	7
Metals						
Aluminum	F30406801E	602	-	-	-	3410
Calcium	F30406801E	602	-	-	-	25900
Chromium	F30406801E	602	-	-	50	14.2
Iron	F30406801E	602	-	-	300	31200
Lead	F30406801E	602	-	-	25	8.1
Magnesium	F30406801E	602	-	-	NA	5010
Manganese	F30406801E	602	-	-	300**	496
Sodium	F30406801E	602	-	-	20000	36600
Zinc	F30406801E	602	-	-	300	101

* Qualifiers; B - In Blank, D - Dilution, J - Estimated

** Iron and Manganese - 500 ppb

1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 19:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND**	CONC. (ppb)
MW-2						
VOA's						
Chloroform	K7970	157	1.0	BJ	7	2
1,1,1 Trichloroethane	K7970	157	1.0	-	5	14
Tetrachlorethene	K7970	157	1.0	J	5	8
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1249	400	1.0	BJ	50	2
Metals						
Aluminum	F30406802E	603	-	-	-	26500
Arsenic	F30406802E	603	-	-	25	12.7
Calcium	F30406802E	603	-	-	-	16300
Chromium	F30406802E	603	-	-	50	32.6
Copper	F30406802E	603	-	-	200	38.8
Iron	F30406802E	603	-	-	300**	31200
Lead	F30406802E	603	-	-	25	23.8
Magnesium	F30406802E	603	-	-	NA	6450
Manganese	F30406802E	603	-	-	300**	1960
Sodium	F30406802E	603	-	-	20000	9430
Zinc	F30406802E	603	-	-	300	54.6

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 20:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND	CONC. (ppb)
MW-3						
VOA's						
Chloroform	K7966	175	1.0	BJ	7	3
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1252	419	1.0	BJ	50	9
Di - n - octyl phthalate	N1252	419	1.0	BJ	50	2
Metals						
Calcium	F30406805E	604	-	-	-	14000
Iron	F30406805E	604	-	-	300**	156
Manganese	F30406805E	604	-	-	300**	18.4
Sodium	F30406805E	604	-	-	20000	6390
Zinc	F30406805E	604	-	-	300	65.8

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 21:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND	CONC. (ppb)
MW-4						
VOA's						
Chloroform	K7984	183	1.0	BJ	7	1
Trichloroethene	K7984	183	1.0	J	5	4
Tetrachlorethene	K7984	183	1.0		5	22
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1253	442	1.0	BJ	50	2
Metals						
Aluminum	F30406806E	605	-	-	-	161000
Arsenic	F30406806E	605	-	-	25	21.5
Barium	F30406806E	605	-	-	1000	541
Beryllium	F30406806E	605	-	-	NA	9.2
Calcium	F30406806E	605	-	-	-	24800
Chromium	F30406806E	605	-	-	50	141
Cobalt	F30406806E	605	-	-	NA	107
Copper	F30406806E	605	-	-	200	308
Iron	F30406806E	605	-	-	300**	212000
Lead	F30406806E	605	-	-	25	27.5
Magnesium	F30406806E	605	-	-	-	15300
Manganese	F30406806E	605	-	-	300**	8080
Mercury	F30406806E	605	-	-	2	0.48
Nickel	F30406806E	605	-	-	NA	110
Potasium	F30406806E	605	-	-	-	11000
Sodium	F30406806E	605	-	-	20000	6360
Vanadium	F30406806E	605	-	-	NA	175
Zinc	F30406806E	605	-	-	300	285

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

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Table 22:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND	CONC. (ppb)
MW-5						
VOA's						
Chloroform	K7968	195	1.0	BJ	7	2
Tetrachlorethene	K7968	195	1.0	J	5	5
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1254	461	1.0	BJ	50	3
Di - n - octyl phthalate	N1254	461	1.0	BJ	50	1
Metals						
Aluminum	F30406807E	606	-	-	-	14200
Barium	F30406807E	606	-	-	1000	285
Calcium	F30406807E	606	-	-	-	27200
Chromium	F30406807E	606	-	-	50	110
Copper	F30406807E	606	-	-	200	29.2
Iron	F30406807E	606	-	-	300**	19000
Lead	F30406807E	606	-	-	25	16.3
Magnesium	F30406807E	606	-	-	300**	6390
Manganese	F30406807E	606	-	-	-	926
Nickel	F30406807E	606	-	-	NA	61.6
Potasium	F30406807E	606	-	-	NA	5850
Sodium	F30406807E	606	-	-	20000	87900
Zinc	F30406807E	606	-	-	300	46.6

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 23:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND	CONC. (ppb)
BLIND DUPLICATE (MW-5)						
VOA's						
Chloroform	K7963	204	1.0	BJ	7	3
Tetrachlorethene	K7963	204	1.0	J	5	6
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1255	485	1.0	BJ	50	2
Di-n-octyl phthalate	N1255	485	1.0	BJ	50	2
Metals						
Aluminum	F30406901E	600	-	-	-	12700
Barium	F30406901E	600	-	-	1000	279
Calcium	F30406901E	600	-	-	-	26300
Chromium	F30406901E	600	-	-	50	101
Copper	F30406901E	600	-	-	200	26.2
Iron	F30406901E	600	-	-	300**	16300
Lead	F30406901E	600	-	-	25	13.9
Magnesium	F30406901E	600	-	-	300**	6020
Manganese	F30406901E	600	-	-	-	823
Nickel	F30406901E	600	-	-	NA	55
Potasium	F30406901E	600	-	-	-	5840
Sodium	F30406901E	600	-	-	20000	87900
Zinc	F30406901E	600	-	-	300	42.4

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 24:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL.*	GW STAND.	CONC. (ppb)
FIELD BLANK						
VOA's						
2 - Butanone	K7960	213	1.0	J	50	4
1,2 Dichloropropane	K7960	213	1.0	J	5	2
Semi-VOA's						
Bis (2-Ethylhexyl) phthalate	N1256	505	1.0	BJ	50	8
Di - n - octyl phthalate	N1256	505	1.0	BJ	50	3
Metals						
None Reportable	F30406902E	601	-	-	-	0

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Table 25:
Groundwater Analytical Summary
for reportable analytes detected
Samples collected on April 7, 1993
(all results in ppb)

ANALYTE	LAB FILE ID	PAGE	DILUTION FACTOR	QUAL. *	GW STAND.	CONC. (ppb)
TRIP BLANK						
VOA's						
Chloroform	K7959	222	1.0	BJ	7	1
2 - Butanone	K7959	222	1.0	J	50	4
Semi-VOA's						
Not Analyzed	-	-	-	-		-
Metals						
Not Analyzed	-	-	-	-		-

* Qualifiers; B - In Blank, D - Dilution, J - Estimated
** Iron and Manganese - 500 ppb
1 Standards for comparison; NYSDEC Title 6, Chap. X, parts 700-705 Class GA and NYDOH standards subpart 5.1

Select the parameter you want shown on the readout of the measured data

SELECT

All six parameters are automatically measured at once. Use the SELECT Key to toggle the upper cursor to the parameter you want.

pH : pH
COND : Conductivity
TURB : Turbidity
DO : Dissolved oxygen
TEMP : Temperature
SAL : Salinity

To get a uniform reading, slowly move the probe up and down to circulate the water through it. (Move it 1 foot (30 cm) per sec.) Then wait for the readout to stabilize while doing this.

Expanded readout

EXP

Use the EXP readout mode when you wish to see the results with one additional decimal place of accuracy. The EXP Key toggles the readout back and forth between standard to expanded display. The table below shows the result of using the EXP readout mode for each of the six parameters.

Table 1. Accuracy of expanded readout

Parameter	Range of measurement	Accuracy	
		Standard readout	Expanded readout
pH	0-14 pH	0.1 pH	0.01 pH
COND	0-1 mS/cm	0.01 mS/cm	0.001 mS/cm
	1-10 mS/cm	0.1 mS/cm	0.01 mS/cm
	10-100 mS/cm	1 mS/cm	0.1 mS/cm
TURB	0-800 NTU	10 NTU	1 NTU
DO	0-19.9 mg/l	0.1 mg/l	0.01 mg/l
TEMP	0-50°C	1°C	0.1°C
SAL	0-4%	0.1%	0.01%

Note that the salinity parameter is the only value not measured directly with its own sensor. The U-10 obtains salinity by converting the conductivity value. If large amounts of conductive ions other than salt-water components are present in the sample, an error may occur. Be cautious when interpreting the salinity results.

In pH meters a readout of this voltage between the two terminals is obtained by increasing it with an amplifier. In actual practice, the pH meter is first calibrated using a standard reference solution of known pH, then the pH of the sample liquid is measured.

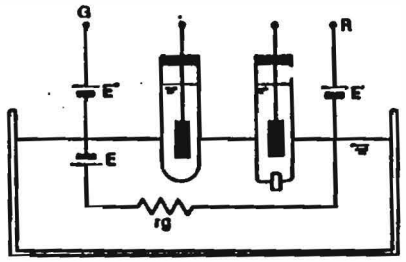

Fig. 5 Principle for Measuring pH

Specifications

pH

Principle	Glass electrode
Range	pH0-14
Resolution	Standard : 0.1pH
	Expanded : 0.01pH
Repeatability	±0.05pH
Temperature compensation	0°-50°C
Readout	LCD
Calibration	1-point auto (Zero)
	Manual 2-point

Temperature

Principle	Thermistor
Range	0°-50°C
Resolution	Standard : 1°C
	Expanded : 0.1°C
Repeatability	±0.3°C
Temperature compensation	—
Readout	LCD
Calibration	—

DO

Principle	Membrane galvanic cell
Range	0-19.9mg/l
Resolution	Standard : 0.1mg/l
	Expanded : 0.01mg/l
Repeatability	±0.1mg/l
Temperature compensation	0°-40°C
Readout	LCD
Calibration	1-point auto (Span)
	Manual 2-point

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APPENDIX I

WATER QUALITY METER SPECIFICATIONS

Conductivity

Principle	4-electrode
Range	0-100mS/cm
Resolution	Standard: 0-1mS/cm : 0.01mS/cm 0-10mS/cm : 0.1mS/cm 10-100mS/cm : 1mS/cm Expanded: 0-1mS/cm : 0.01mS/cm 0-10mS/cm : 0.1mS/cm 10-100mS/cm : 1mS/cm
Repeatability	±1%/F.S. within each measurement range
Temperature compensation	0°-50°C
Readout	LCD
Calibration	1-point auto (Span) Manual 2-point

Turbidity

Principle	Scattered/Transmitted light
Range	0-800 NTU
Resolution	Standard : 10 NTU Expanded : 1 NTU
Repeatability	±3%/F.S.
Temperature compensation	—
Readout	LCD
Calibration	1-point auto (Zero) Manual 2-point

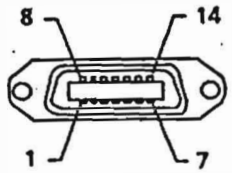
Salinity

Principle	Conversion based on conductivity
Range	0-4%
Resolution	Standard : 0.1% Expanded : 0.01%
Repeatability	±0.1%
Temperature compensation	0°-30°C
Readout	LCD
Calibration	—

Common specification

Data storage	Max. 20 samples
Printer output	Centronics specs.
Power	Battery 9V, with auto power-off function
Operating temperature	0°-45°C
Weight	Main unit: Approx. 400g Probe, with 2-m cable: Approx. 800g

- Output connector pin layout



Pin No.	Name	Pin No.	Name
1	STB	8	DB_6
2	DB_0	9	DB_7
3	DB_1	10	Not used
4	DB_2	11	BUSY
5	DB_3	12	Not used
6	DB_4	13	Not used
7	DB_5	14	GND