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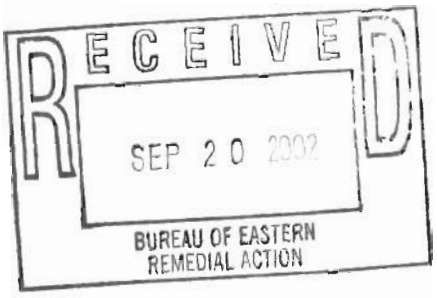
Plan for Air Sparge System

Operable Unit 01-Soil and Groundwater On-Site

Westbury Valet Dry Cleaners
123 Post Avenue
Westbury, New York



Site No. 1-30-088

Prepared for:

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50 Wolf Road
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1.0 INTRODUCTION

This document is the proposed plan for remediating the on-site contaminated groundwater at Westbury Valet Dry Cleaners, 123 Post Avenue, Westbury, New York. The proposed plan was prepared by Anson Environmental Ltd. (AEL) on behalf of Choe Realty, LLC, doing business as Westbury Valet Dry Cleaners. This document was prepared in accordance with Order on Consent, Index No. WI-0860-99-13, for Site Code No. 1-30-088 and addresses the remediation of the remaining underlying soil contamination below two floor drains and the remediation of groundwater contamination below the Westbury Valet Dry Cleaners property boundaries. For the purposes of this document, the contaminants of concern are tetrachloroethylene and its degradation products.

1.1 Site History

The following is a brief summary of historical activities that have taken place at the Westbury Valet Dry Cleaners site.

1949 Application for plumbing permit issued to John C. Leonardo and the building was constructed.

1957 Certificate of Occupancy issued for storage room as addition to dry cleaning business to Westbury Valet Co., Inc., John Leonardo, Vice President.

1979-1980 Subject property connected to municipal sewer system.

1987 Business purchased by Westbury Valet Dry Cleaners, Inc., and began operating the new business at the site as Westbury Top Cleaners. The property is owned by Choe Realty, LLC.

1996 Nassau County Department of Health (NCDH) identified two floor drains for sampling and closure under the EPA Underground Injection Control (UIC) Class V Injection Well closure program (Figure 1). AEL sampled two floor drains inside the on-site building. The sediment in the drains was determined to be contaminated with tetrachloroethylene. AEL recommended delineation of the contamination.

1997 Apex Environmental conducted Phase I and II investigations of a downgradient parcel, located on the south side of the Long Island Rail Road tracks, at 117 Post Avenue. It was determined that tetrachloroethylene and its breakdown products

were present in the groundwater beneath that location. Apex Environmental determined the direction of groundwater to be southwesterly.

1998 The Westbury Valet Dry Cleaners was contacted again by the EPA and NCDH to submit a plan and perform the UIC closure. AEL conducted further sampling of Floor Drain #2 in order to delineate the vertical extent of the contamination (Figure 1). In August, the on-site two floor drains were cleaned out and endpoint samples collected. Based on these sample results, a work plan for further on-site investigation was submitted. In December 1998, the site was included in the NYS Registry of Inactive Hazardous Waste Sites.

1999 In March, AEL installed three on-site groundwater monitoring wells (Figure 1). The upgradient well, located to accommodate the denial of access by the property owner immediately adjacent to the north, was installed adjacent to the northeast corner of the Westbury Valet Dry Cleaners building. Two groundwater monitoring wells were installed downgradient of the inside floor drain locations. The groundwater was sampled and it was confirmed that tetrachloroethylene was present in all three wells at concentrations above the NYSDEC groundwater standards (see Table 1).

2000 On October 4, 2000, groundwater samples were collected at approximately 40-feet, 60-feet and 80-feet below grade surface (bgs) at three on-site locations down gradient of the building (Figure 1). The purpose of the sampling was to determine the vertical and horizontal extent of groundwater contamination with tetracholorethylene and its breakdown products. In summary, the most significant contamination is located in the vicinity of and downgradient of Floor Drain #2. The contamination is highest between approximately 30 to 50-feet bgs. The plume of contamination leaving the Westbury Valet Dry Cleaners site appears to be approximately 40 feet wide.

The October investigation also included the collection of soil samples from the vicinity of the former on-site abandoned sanitary system (Figure 1). None of the samples contained tetrachloroethylene or its break down products. The laboratory analytical data sheets are in the site Remedial Investigation Report, dated December 2000.

2001 The NYS Department of Health started analyzing indoor air samples for tetrachloroethylene in February 2001. Elevated concentrations of tetrachloroethylene were detected at 125 and 129 Post Avenue. AEL installed four shallow Soil Vapor Extraction (SVE) wells starting in May 2001. The shallow SVE system was made operational in May 2001 and has operated continuously since June 1, 2001.

The sampling of indoor air indicated that the concentrations of tetrachloroethylene had declined significantly according to the June 2001 sampling.

The following documents concerning this site were prepared for NYSDEC, and it is recommended that they be reviewed for additional details about the Westbury Valet Dry Cleaners property:

- AEL, April 26, 2001 Interim Remedial Measure Work Plan
- Dvirka and Bartilucci, December 2000. Remedial Investigation/Feasibility Study Work Plan. Operable Unit II 123 Post Avenue, Westbury, Nassau County, New York.
- AEL, December 2000. Remedial Investigation Report.
- AEL, August 30, 2000 Remedial Investigation/Feasibility Study Work Plan.

2.0 PHYSICAL SITE CHARACTERISTICS

2.1 Site Description

The building located at 123 Post Avenue is a stand-alone building that is occupied by Westbury Valet Dry Cleaners for the purposes of dry cleaning clothing and washing shirts (Figure 2). The property is owned by Choe Realty, LLC, which purchased the property in 1987. The previous occupant of the property was Westbury Valet Co.

As part of their dry cleaning process, Westbury Valet Dry Cleaners uses tetrachloroethylene to clean clothing.

2.2 Physical Layout of Building

The property is rectangular in shape and measures approximately 50-feet in the north/south direction and 189-feet in the east/west direction (Figure 3). The property contains a single-story concrete block and masonry building that is approximately 3,494 square feet in size. The building was built in 1949 and was renovated in 1954. It is built on a concrete slab and has no basement. The building has been operated as a dry cleaner since the 1950s and is the only type of business in the building. The building is currently connected to the municipal water and sewer systems.

The building is located on the northern property boundary and is approximately 20-feet from the concrete wall/rail bed for the Long Island Rail Road on the south. A single two-story commercial building is located on the north side of the subject property northern boundary. The two-story building contains three business operations including a chiropractor and a delicatessen.

Building plans on file at the Town of North Hempstead Building Department and Village of Westbury indicate that the original construction included on-site cesspools for wastewater disposal. These cesspools were located below the parking lot on the east side (Post Avenue side) of the building (Figure 1). The subject property building was connected to the municipal sewer line below Post Avenue sometime between 1979 and 1980 and the on-site cesspools were soon after abandoned by Westbury Valet Dry Cleaners. As Choe Realty did not occupy this building prior to 1980, information regarding the volume and composition of the wastewater discharged to these abandoned cesspools is not available.

There were two floor drains located inside the building (Figure 1). Floor Drain No. 1 (FD#1) was located in the boiler room on the southwestern corner of the building. Floor Drain No. 2 (FD#2) was located in the vicinity of the dry cleaning machines near the center and the south side of the building. Both floor drains terminated in the soils below the floor of the building.

A review of the building plans on file at the aforementioned agency building departments did not reveal the earlier existence of on-site storm drains or rainwater drainage devices. None of these drainage devices exist on-site at this time.

Presently, Westbury Valet Dry Cleaners uses tetrachloroethylene to clean clothing. Bulk tetrachloroethylene is received in 55-gallon drums and stored indoors on a concrete floor. Tetrachloroethylene contaminated wastes such as sludge and lint are placed into properly placarded 30-gallon drums and stored indoors on the concrete floor until Safety Kleen Corp. removes the waste for disposal off-site. There are no signs of spillage observed at the drum storage area.

2.3 Geologic Setting

The site is located near the southern perimeter of the Town of North Hempstead. The groundwater reservoir underlying the Town of North Hempstead is composed of unconsolidated local deposits of Holocene age, glacial deposits of Pleistocene Age, and coastal-plain deposits of continental and marine origin of the Late Cretaceous Age. The deposits consist of clay, silt, and bedrock. Weathered and crystalline bedrock of Low Paleozoic and/or Precambrian Age underlies the unconsolidated deposits and forms the virtually impermeable base of the groundwater reservoir.

From oldest (deepest) to youngest (shallowest) these sediments have been identified and divided into a series of hydrogeologic units: the Lloyd aquifer; the Raritan clay confining unit; the Magothy aquifer, and the Upper Glacial aquifer.

The Upper Glacial aquifer consists of late Pleistocene and Holocene age sand, gravel, silt, and clay deposits. The upper surface of the upper glacial deposits comprise present day land surface except in areas such as the Westbury site where they are overlain by recent Holocene deposits and/or fill materials. The water table at the site is found in this aquifer at a depth of approximately 35 feet below grade.

The southernmost part of the Town is underlain by highly permeable glacial outwash consisting of stratified sand and gravel and occasional thin clay beds. The deposits forming the Upper Glacial Aquifer range in thickness from 6 feet to more than 350 feet. The extreme variation in thickness results from the highly eroded surface upon which these materials were deposited and the irregularity of their upper surface that is the present land surface. The outwash deposits range in thickness from 14 feet to about 165 feet.

The Magothy Aquifer is the principal aquifer underlying the Town of North Hempstead. It consists mainly of lenticular bed of very fine to medium sand that are interbedded with beds of

clay, sandy clay, silt and some sand and gravel. The aquifer reaches a maximum thickness in the southeast corner of the Town, where its thickness is about 530 feet.

2.4 Public Water Supply Wells

Previous investigations concerning the subject property identified three public water supply wells. Wells numbered 101 and 7785 are located north and upgradient of the subject site. The downgradient Well 5654 is located on Old Country Road west of Post Avenue and is indicated in Figure 3.

The following information was provided by United States Geological Survey (USGS) in conjunction with the Nassau County Department of Public Works (NCDPW).

Well No.	Year Completed	Depth of well	Screen length	Aquifer
101 (well 6)	1970	341	61	Magothy
5654 (well 11)	1956	340	60	Magothy
7785 (well 7)	1965	404	70	Magothy

Water quality data has been secured from the Westbury Water District for the three listed wells covering quarterly sampling by H2M Labs for the last five years. Concentrations of individual volatile organic compounds (VOCs) have not exceeded the groundwater standards in the wells in question. The aforementioned water quality data is included in the Remedial Investigation / Feasibility Study (RI/FS) dated December 2000, and submitted to NYSDEC by Dvirka and Bartilucci, Consulting Engineers. The RI/FS also contains additional information about the above listed wells.

2.5 Identification and Remediation of Suspect Source Areas

The site investigations determined tetrachloroethylene and its breakdown products are the primary contaminants of concern that were detected in the soil samples that were collected in the two floor drains on-site (Figure 1). No other sources of contamination have been identified in the soils on-site.

2.5.1 Floor Drain No. 1

Floor Drain No. 1 (FD#1) was constructed using a short pipe installed perpendicular to the on-site building floor. The short pipe emptied into the soils below the floor. The soils below FD#1 contained elevated concentrations of tetrachloroethylene.

A large commercial vehicle equipped with a high power vacuum ("SuperSucker") was used to clean out the contaminated soils in FD#1 to one-foot bgs. Subsequently, endpoint samples were collected and laboratory analysis determined that the remaining soils met the NYSDEC standards. No further remedial action is required in this area of the site.

2.5.2 Floor Drain No. 2

Floor Drain No. 2 (FD#2) was originally constructed as a hole in the concrete floor. Sampling of the soils beneath the concrete determined that tetrachloroethylene had contaminated the soils. Before attempting to cleanout FD#2, the surrounding concrete floor was broken up to gain access to the deeper soils below the floor drain. Thereafter, a SuperSucker, was used to excavate the soils below the floor drain to 6-feet bgs and 4-feet wide.

Endpoint samples collected after the SuperSucker cleanout activity, determined that the remaining soils exceeded NYSDEC standards.

On March 31, 1999, to determine the vertical extent of the contamination in soils below FD#2, AEL used a Geoprobe unit to collect soil samples inside the floor drain at 10 to 11-feet, 20 to 22-feet, 30 to 32-feet and 36 to 40-feet bgs. The sample collected at 36 to 40-feet bgs was collected in groundwater. Each sample was submitted to EcoTest Laboratories, North Babylon, New York and analyzed for concentrations of VOCs using EPA Method 8260. The results of the laboratory analysis are summarized in the following table. Samples were screened in the field using a photoionization detector (PID).

Volatile Organic Compounds Detected in Soil Samples Collected from Floor Drain No. 2

Detected Compounds	10-11 (ft)	20-22 (ft)	30-32 (ft)	36-40 (ft)	Standard
	ppb	ppb	ppb	ppb	ppb
tetrachlorethene	270,000	53	17	62	1,400
1,4-dichlorobenzene	<1,000	2	<1	<1	
1,2,4-trichlorobenzene	<1,000	52	<1	<1	
naphthalene	<1,000	1	<1	<1	
hexachlorobutadiene	<1,000	3	<1	<1	
PID headspace (ppm)	1,192	1,928	231	no reading	

The aforementioned information relating to FD#2 was presented to Nassau County Department of Health in the AEL Environmental Investigation of Class V Well Report for the site dated May 30, 1999 (Appendix 1).

The vertical extent of the soil contamination was determined by installing a soil boring outside the building wall directly south of FD#2.

3.0 SUMMARY OF GROUNDWATER SAMPLING AND ANALYSIS

The following work was performed to investigate the groundwater quality below the Westbury Valet Dry Cleaners at 123 Post Avenue, Westbury, New York.

3.1 Installation of On-Site Groundwater Monitoring Wells

Three 2-inch diameter PVC groundwater monitoring wells were installed on-site and were first sampled on March 31, 1999. The location of these wells is indicated on Figure 1. The survey elevation and depth performed at each well on August 4, 2000 is listed in Table 2. Table 2 also lists the depths to water and depths to well bottom as measured on October 31, 2001. Construction details of the three monitoring wells are contained in Appendix 2.

Monitoring Well No. 1 (MW#1), a slightly upgradient well, is installed near the northeast corner of the building as shown on Figure 1. Monitoring Well No. 2 (MW#2) and Monitoring Well No. 3 (MW#3), both downgradient wells, are installed on the south side of the property. MW#3 is located directly south of Floor Drain No. 2. MW#2 is installed west of MW#3.

3.2 Groundwater Monitoring Well Sampling

Groundwater samples were collected from these monitoring wells on the dates listed below:

March 31, 1999 October 3, 2000 July 18, 2001 October 31, 2001 June 27, 2002

Before collecting a groundwater sample from a monitoring well, at least 3 to 5 volumes of standing liquid was purged from the well. The purged liquid was stored on-site for appropriate disposal at a later date.

The collected groundwater samples were submitted to a certified laboratory where they were analyzed for concentrations of VOCs. Tables 1, 3, 4, 5 and 7 summarize the concentrations of VOCs that the laboratory detected in the samples. With the exception of the October 2001 and July 2002 sampling, the data are consistent and indicate that MW#3 is the most contaminated.

The following table lists the concentrations of tetrachloroethene detected in the groundwater samples collected on the aforementioned dates.

Concentrations of Tetrachloroethene Detected In Laboratory Samples

Sample Date	MW#1 (ug/L)	MW#2 (ug/L)	MW#3 (ug/L)
3/31/99 (Table 1)	95	690	20,000
10/03/00 (Table 3)	1,200	5,800	16,000
7/18/01 (Table 4)	90	6,200	23,000
10/31/01 (Table 5)	24	26	86
6/27/02 (Table 7)	8	7	4

The reduced concentrations of tetrachloroethene detected in the groundwater samples collected on October 31, 2001 are not consistent with those collected on the previous collection dates. On June 27, 2001, to resolve this apparent ambiguity, AEL assisted NYDEC in their collection of new groundwater samples. The NYSDEC laboratory analytical results released to AEL are contained in Appendix 6. The NYSDEC laboratory results confirm that the on-site groundwater contamination levels have been significantly reduced.

Table 3 contains the laboratory data used to delineate the vertical extent of tetrachloroethylene in the groundwater and to monitor the effectiveness of the AS system.

3.3 Geoprobe Groundwater Sampling

On October 4, 2000, using a vehicle mounted Geoprobe unit, AEL collected groundwater samples at the locations designated GW#1, GW#2 and GW#3 (Figure 1). At each location groundwater samples were collected at the depths below grade surface (bgs) listed as follows:

GW#1	36-40 feet,	56-60 feet	76-80 feet
GW#2	40-44 feet,	56-60 feet	76-80 feet
GW#3	40-44 feet,	56-60 feet	76-80 feet

The samples were collected by initially advancing the Geoprobe rods to a depth of approximately 80-feet bgs at each location. The rods were then raised one-foot to permit groundwater to enter the sampling tube containing the 4-feet long screen assembly and a groundwater sample was collected using new poly tubing and a stainless steel check valve. The probe was then raised to a depth of 60-feet bgs and the sample collection process repeated. A final groundwater sample was collected by raising the probes to a depth of 40-feet bgs and repeating the sampling process.

All samples were collected by purging the probe rods and then pumping the groundwater directly into laboratory-issued 40 milliliter glass vials. The groundwater samples were delivered to an ELAP-certified laboratory and analyzed for chlorinated volatile organics using EPA Method 8260.

The laboratory data for these nine groundwater samples are summarized in Table 6.

3.4 Water Table Elevation Survey

On-site groundwater monitoring well casings and the water table were surveyed to the nearest 0.01 foot (see Table 2). According to the USGS for the Westbury area, the surface elevation of the site is approximately 100-feet above mean sea level.

Based on the March 1999 depth to groundwater measurements (Table 1), the direction of groundwater flow is toward the south-southwest.

The depth to groundwater in MW#3 has varied from 33.36 to 37.5 feet below grade between March 1999 and October 2001. Measurement of other wells on-site illustrated similar variation during this time period.

MW#1 is up and cross gradient of the contamination sources Floor Drains #1 and #2. MW#2 is down gradient of Floor Drain #1 and MW#3 is down gradient of Floor Drain #2.

3.5 Evaluation of Ground Water Analytical Data March 1999 and October 2001

To aid in the evaluation of the groundwater quality performed for this project, the concentrations of tetrachloroethylene detected in the samples collected from the on-site monitoring wells and from the Geoprobe borings were evaluated for the 40-foot, 60-foot and 80-foot depth horizons. The detected concentrations for the various analyzed samples are tabulated in Table 6.

A review of the laboratory analysis of groundwater samples collected from MW#1, MW#2 and MW#3 indicates that tetrachloroethylene was detected at elevated concentrations in all three monitoring wells on-site. The on-site slightly upgradient and cross gradient well MW#1 has contained elevated levels of tetrachloroethylene that have ranged from 24 to 1,200 micrograms per liter (ug/L), indicating that there is a possible off-site source of contamination.

MW#2 also has elevated concentrations of tetrachloroethylene ranging from 26 to 6,200 ug/L. MW#3 has the most elevated concentrations, 86 to 20,000 ug/L. Based on the vertical extent of

soil contamination in FD#2, the source of this downgradient groundwater contamination is most likely Floor Drain #2.

The Geoprobe groundwater samples confirmed that the greatest level of contaminated groundwater is between approximately 33 and 50-feet bgs. The groundwater samples collected at 55-feet bgs indicate that the concentration of tetracholorethylene up and down gradient of the site is approximately the same.

Therefore, the on-site remediation system will be designed to address the on-site groundwater contamination at depths of approximately 33 to 50-feet bgs. This remediation system is described in Section 4.0 of this report.

4.0 REMEDIATION SYSTEM DESIGN

The remediation system proposed for Westbury Valet Dry Cleaners will consist of two subsystems, a Soil Vapor Extraction (SVE) system and an AS system. A block diagram of the SVE system already installed and operating on-site is in Figure 4. The SVE system is designed to collect and treat the remaining tetrachloroethylene and tetrachloroethylene degradation products from the vadose zone below the site. The SVE system was installed to capture the shallow volatile organic vapors in the soils on and off-site. This system has been very effective in reducing the soil contamination on-site and controlling the contaminated soil vapors affecting adjacent properties.

To operate in conjunction with the AS system, the SVE system will be modified to operate with two deeper extraction wells. As the proposed AS system operates to remove the tetrachloroethylene and its degradation products from the groundwater in the Upper Glacial Formation beneath the property, the deep extraction wells will strip vapor phase tetrachloroethylene and its degradation products from the soils in the vadose zone above the groundwater table. Because of the limited access to the area at the southern boundary of the site, AEL plans to install two sets of one deep SVE extraction well and one sparge point in the same boring. The planned construction details are indicated in Figure 8.

4.1 Existing Soil Vapor Extraction System

The existing SVE system for this site includes four shallow SVE wells (RW-1S, RW-2S, RW-3S and RW-4S) that are screened as indicated in Appendix 3. Each of the SVE wells was completed at grade with a regulating ball valve arranged in a manifold such that each SVE extraction well can be operated independently. The extraction wells are connected to a 2-inch diameter PVC manifold located in the SVE equipment shed (Figure 5).

The soil vapor is extracted using a 5-horsepower regenerative blower located in the SVE equipment shed. Under the influence of a vacuum created by the blower, the soil vapor passes through a moisture separator drum and a particulate filter and into the blower. The blower exhaust under comparatively low pressure then flows through two air purification canisters connected in series. The output of air purification canisters is fed to the SVE exhaust stack that is vented to the atmosphere above the Westbury Valet Dry Cleaners building.

Each air purification canister is filled with granulated carbon and weighs approximately 600-pounds. The 4-inch diameter PVC exhaust stack is attached to the side of the building with the stack discharge point at a height of 8-feet above the building roof. Electrical power for the SVE blower is supplied from a dedicated distribution panel located inside the SVE shed.

Periodically, AEL various measurements on parameters of the SVE system and has determined that Radius of Influence (ROI) of the operating system is approximately 50-feet. The ROI of each extraction well is indicated by dashed circles in Figure 6.

4.2 Soil Vapor Extraction Well Design

To operate the proposed dual SVE and AS system, the existing SVE system will be modified by adding two 4-inch diameter PVC deep SVE wells. These wells will be installed using a hollow stem auger drill rig. The drill rig will install one boring that will be used to initially install one air sparge well followed by one SVE deep extraction well. The description of the air sparge well installation is presented in Section 4.3

The 0.020-inch screened portion of each deep SVE extraction well measure 10-feet long and will be installed from a depth of three feet above the measured water table to approximately 17-feet bgs. This installation depth will result in an overlap of the soil vapor extracted by the existing SVE shallow wells. The depth to the water table on the south side of the on-site building is approximately 33-feet bgs. The remainder of the extraction well will be constructed of flush joint PVC pipe to the ground surface. The well construction details are indicated in Table 8 and Figure 8. Each extraction well will be finished to grade with a metal access cover.

4.3 Air Sparge Well Design

Two air sparge wells (AS#1 and AS#2) will be installed using a hollow stem auger drill rig at the locations illustrated on Figure 5. Each of the sparge wells will be constructed using 2-inch diameter PVC flush joint piping. The screened portion of each air sparge well will be 2-feet long with 0.010-inch slot. Each well will be finished to grade using solid 2-inch diameter PVC pipe. The air sparge wells will be placed from 58 to 60-feet below the ground surface which is approximately 25-feet into the water table. These two wells will be located along the down gradient property line (Figure 5). Each sparge well will be constructed as indicated Table 8 and Figure 8. To prevent the creation of a preferential pathway along the borehole, each air sparge well will be grouted above the screened interval to the groundwater interface with the vadose zone.

The location of AS#2 has been selected to be south of FD#1 and the final location of the boring for RW-1D and AS#1 will be determined after a review of the ROI pilot testing for RW#2 and AS#2 as described in Section 5.0.

4.4 Air Sparging System Design

The AS system is designed to reduce concentrations of tetrachloroethylene and other VOCs that are adsorbed to the soils and dissolved in the groundwater at the Westbury Valet Cleaners site. The AS technology, also known as "in situ air stripping" and "in situ volatilization", involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of volatile organic compounds from a dissolved state to a vapor phase. The air is then vented through the unsaturated zone. Air sparging is most often used together with soil vapor extraction (SVE). When the air sparging is combined with SVE, the SVE system creates a negative pressure in the unsaturated zone through a series of injection wells to control the vapor plume migration.

The air sparge system installed at Westbury Valet Dry Cleaners will consist of a motor driven compressor, a pressure relief valve, air flow control valves, flow meters and pressure gauges to monitor system parameters, and associated interconnect steel and PVC piping. During normal operation, the compressor will provide pressurized contaminant-free air for the system.

The Air Sparge electrical and mechanical equipment will be installed in a metal equipment shed to be located at the southern side of the Westbury Valet Dry Cleaners building (Figure 5. The AS compressor and motor unit will be placed in a separate equipment shed to reduce the outside noise level. The shed will be located on the south side of the Westbury Valet Dry Cleaners building to prevent noise issues that may offend local residents.

The following sections describe the various components of the AS system to be installed at the Westbury Valet Dry Cleaners site. A schematic drawing is presented in Figure 7.

4.4.1 Air Sparge Compressor and Motor

Gast Manufacturing, Inc., Carlstadt, New Jersey will supply the AS compressor and motor. A 7.5 horsepower open drip proof motor drives the sparge compressor. Gast Manufacturing supplies the compressor and drive motor as a unit. Baldor Industrial Motor, Fort Smith, Arizona, manufactures the drive motor for the compressor. The following is a listing of the product specifications for the compressor and motor:

Gast Compressor:

Model Number:	6066-P122A-T905
Maximum Pressure:	20 psi
Maximum Flow:	55 SCFM

Baldor Motor

Model Number:	M3311T
Voltage Required:	208-230 vac, Three Phase, 60 Hz
Current Required:	23-22 amps
Speed:	1725 rpm

Net weight of motor and compressor unit is 205-pounds. The manufacturer's information sheets for the compressor and motor are in Appendix 2.

AEL is currently successfully using this compressor/motor combination at a site located in New Cassel, New York, approximately one-mile east of Westbury Valet Dry Cleaners. The soil conditions at the New Cassel site and the Westbury Valet Dry Cleaners site have similar soil conditions. The air sparge ROI achieved at the New Cassel site using the described motor/compressor combination is 48-feet.

4.4.2 System Pressure Gauge

System air pressure will be measured by a pressure gauge installed at the input of the AS manifold unit. Gast Manufacturing supplies the system pressure gauge. The following is a description of the system pressure gauge:

Model Number:	AA644B
Mounting:	1/4-inch NPT Bottom Mount
Face:	2-inch Face, 0 to 30 PSI

The manufacturer's information sheet for the flow meter is in Appendix 2.

4.4.3 Pressure Relief Valve

A system pressure relief valve will be installed at the input port of the AS manifold. Gast Manufacturing, Inc., Carlstadt, New Jersey, supplies the system pressure relief valve. This adjustable valve is installed as a safety device and opens when the system pressure exceeds ranges from 2 to 20 PSI. The following is a description of the system pressure relief valve:

Model Number:	AE 960
Pipe Size:	1-inch NPT
Range:	2 to 20 psi, Adjustable
Usage:	For flows below 60 CFM

The manufacturer's information sheet for the flow meter is in Appendix 2.

4.4.4 Manifold Flow Control Valves

Each output port of the AS manifold unit will be equipped with a flow control valve (Figure 7). When the AS system is functioning, opening the flow control valve will cause increased air flow and increased pressure in the delivery piping of the associated sparge point. Conversely, closing the flow control valve will decrease air flow and pressure in the delivery piping of the sparge point. The 1-inch diameter brass manifold flow control valves to be installed in the AS system are manufactured by Mueller Industries, Inc. and have a useable working pressure up to 150 psi. However, these valves can be replaced with any generic type of the same size and working pressure.

4.4.5 Pressure Bleed Valves

Each output port of the AS manifold is equipped with a pressure bleed valve. This valve is used to decrease the pressure in the air delivery piping for the associated sparge point. The pressure bleed valves are normally used during adjustment of air flow and pressure for each of the two sparge points. The pressure bleed valves are the same type of valves used for the manifold flow control valves described above.

4.4.6 Flow Meters

The air delivery piping of each of the two sparge points is equipped with a flow meter. The flow meter is used to continually monitor the quantity of air being delivered to the sparge point. Dwyer Instruments, Inc., Michigan City, Indiana, manufactures the flow meter that has a range of 5 to 50 SCFM. The manufacturer's information sheet for the flow meter is in Appendix 2.

4.4.7 Sparge Point Pressure Gauge

A pressure gauge is installed in the piping following the flow meter for each sparge point. These gauges are used to continuously monitor the pressure in the associated sparge point piping. The pressure gauges are manufactured by Weiss Instruments and have a range of 0 to 60 psi. The model number of each gauge is 554-25.

4.4.8 Starter Switch for Air Sparge Compressor Motor

The magnetic starter switch for the air sparge motor will be installed on the west wall of the shed. The switch will be equipped with a power ON push button, a power OFF push button, and a RESET push button. Cutler-Hammer, Milwaukee, Wisconsin, manufactures the switch.

4.4.9 Operational Parameters

The air flow to each sparge point will be at a flow rate of 25 SCFM at approximately 12 psi. These settings are consistent with the manufacturer's specifications for the compressor.

5.0 PILOT TESTING PROGRAM

5.1 SVE Unit

The existing SVE system has been operating since May of 2001. Since the SVE began continuous operation, the performance of the system has been periodically monitored. The radius of influence (ROI) of the operating system with four shallow remediation wells has been determined to be approximately 50-feet. The ROI calculations are made on a weekly basis using the six piezometers (P1 to P6) located on-site (Figure 6).

AEL anticipates the ROI for the modified SVE with two deep extraction wells (RW1-D and RW-2D) will continue to be 50-feet.

AEL plans a two step installation for the air sparge and a deep extraction wells. First the RW-2D and AS#2 pair will be installed in the same boring followed later by the installation of RW-1D and AS#1. Following the installation of RW-2D and AS#2 the ROI for RW-2D will be determined by measuring the pressure change on MW#2 and MW#3 which are screened from 25 to 44-feet bgs (Appendix 3). Once the ROI calculation for RW-2D has been completed, RW-2D will be turned off so the ROI can be calculated for AS#2.

The ROI measurement data will be used to locate the boring that will be used to install RW-1D and AS#1.

5.2 Air Sparging Unit

After air sparge point AS#2 is installed, it will be connected to a 7.5 horsepower Gast motor/compressor to determine its ROI. The ROI will be determined by measuring pressures, depth to water and dissolved oxygen levels at MW#2 and MW#3.

Prior to the start of the ROI test, the depth to water in wells MW#2 and MW#3 will be recorded. After the compressor is connected to AS#2, compressed air will be delivered to the sparge point. The anticipated rise in water elevation in MW#2 and MW#3 will be recorded at 5-minute intervals.

Later, the water elevation readings will be used to determine the ROI of the sparge point.

After the ROI of AS#2 is determined, AS#1 will be located and installed so that the influence of the two sparge points results in a 15-percent overlap ROI.

In addition to the aforementioned measurements, ROI and system effectiveness will be evaluated by periodically measuring dissolved oxygen and VOC emissions at MW#2 and MW#3.

5.3 System Operation

Following installation of the two AS wells and the two deep SVE wells, the AS and SVE systems will be turned on and the resultant ROI will be calculated again.

To ensure that vapors liberated by the injection of air at the sparge points are captured by the SVE system, the electrical power controls will be designed to ensure that the AS system can not operate without the SVE system being fully operational.

Vapors captured by the SVE system during the pilot test of the AS system will be monitored with a PID to determine if the existing air purification canisters are properly sized.

The New York State Department of Health (DOH) has been periodically conducting indoor air sampling at the buildings adjacent to Westbury Valet Dry Cleaners. Prior to the scheduled startup of the AS system, the DOH will be notified so they can conduct air sampling within one week of the startup.

6.0 MAINTENANCE AND MONITORING SCHEDULE

6.1 Introduction

The Operations and Maintenance (O&M) section describes the operation of the Soil Vapor Extraction and Air Sparging system at the Westbury Valet Dry Cleaners facility located at 123 Post Avenue, Westbury, New York. The O&M section addresses, component by component, the standard maintenance needed to operate the system according to equipment manufacturer's recommendations.

6.2 Maintenance Procedures

General

- The door to the equipment shed should be opened weekly and a brief check should be performed for possible air leaks, vacuum leaks, excessive temperatures, freezing conditions or other equipment related issues.

Air Compressor

- The air compressor should be inspected periodically on a weekly and monthly schedule.

Weekly

- Clean screen in automatic drain valve.

Monthly

- Inspect for air leaks.
- Check tightness of screws and bolts. Tighten as needed.
- Clean Exterior.

Yearly or after 2000 operating hours

- Replace air filter.

Pressure Regulators

- There are no periodic maintenance procedures recommended by the manufacturer.

SVE Regenerative Blower

Weekly

- Check vacuum gauge at inlet and record value.
- Check rainwater reservoir at bottom of stack and drain as needed.

Moisture Knock-Out Drum

Weekly

- The liquid level in the drum should be checked once a week. Turn off the power to the blower using the circuit breakers marked on the electric panel. Place a container in front of the drain valve at the bottom of the drum and open the drain valve. If water flows out of the drum, the drum should be drained and the water stored in a suitable container with a water-tight lid. The system can then be restarted. Contact AEL to arrange for the proper disposal of the liquid.
- The moisture knock-out drum contains an air filter to prevent sediment from entering the blower. The filter should be checked every 6 months or after a significant increase in the measured vacuum at the inlet to the blower. The filter element should be either cleaned or replaced depending on the condition of the element.

Vacuum Relief Valve

- There are no periodic maintenance procedures recommended by the manufacturer.

Carbon Canisters

- The sampling ports on the discharge side of the blower should be monitored weekly using a PID meter and the values recorded. The pre-carbon, mid-carbon, and post carbon sampling ports will be monitored using a PID. Once the PID indicates breakthrough of the carbon, AEL will notify NYSDEC of the need for a carbon canister replacement and will replace the unit. Frequently, only one canister must be replaced at a time. Carbon canister breakthrough may also be indicated by the laboratory analysis of the air bag samples collected on a monthly schedule.
- There are no periodic maintenance procedures recommended by the manufacturer.

6.3 Records, Monitoring and Sampling

6.3.1 Records and Monitoring

A copy of the SVE and Air Sparge system log sheet for the proposed system at Westbury Valet Dry Cleaners is contained in Appendix 4. Blank copies of this log sheet will be placed in the SVE system equipment shed on a clip board. Completed copies of the log sheet will be returned to the AEL office where they will be placed in a dedicated file for future reference. Using the log sheets, the following information will be recorded.

Information	Frequency
Vacuum of blower	Weekly during first 3 months, monthly thereafter
PID readings of vapor discharge	Weekly during first 3 months, monthly thereafter
Shallow and deep sparging pressures	Weekly during first 3 months, monthly thereafter
Any repairs, maintenance or adjustments	as needed

6.3.2 Sampling

Soil Vapor

- AEL will collect Tedlar air bag samples of the extracted soil vapor on a monthly schedule until the laboratory results for these samples indicate that a schedule change is warranted. At that time, the NYSDEC will be petitioned for a sampling schedule change. The samples will be analyzed for concentrations of VOCs including tetrachloroethylene using EPA Method 8260.

Groundwater

- The groundwater samples require the use of portable pumps. These sample collections will be performed by AEL on a quarter year schedule. The samples will be analyzed for concentrations of VOCs including tetrachloroethylene using EPA Method 8260.

Reporting

- The soil vapor and groundwater laboratory data will be summarized in quarterly reports that will be submitted to the NYSDEC. The reports will include tables and/or graphs presenting the baseline concentrations measured before startup of the system and the quarterly results acquired thereafter.

7.0 REMEDIATION SYSTEM MONITORING AND TERMINATION CRITERIA

The monitoring schedule was developed for the operation and maintenance of the SVE and AS systems. Evaluation of historical plots of the data generated during the operation of this equipment will be used by NYSDEC and AEL to determine when it is appropriate to shut off the remediation equipment.

At the point when the system performance has achieved asymptotic conditions, collection of soil samples from borings drilled in the source area, and comparison to Recommended Soil Cleanup Objectives (RSCOs) is required. If soil samples are below RSCOs, NYSDEC may elect to shut the system down. If RSCOs are not achieved, further remedial action will likely be necessary.

This may include continued system operation or, if necessary, system optimization (system modifications, additional wells, etc.) until RSCOs are achieved.

In addition to collecting endpoint soil samples before the soil vapor extraction system is permanently shut down, soil gases will be collected as well. These sampling activities will help to confirm the absence of residual contamination that could affect soil gas and indoor air quality.

7.1 SVE Unit Monitoring and Termination Criteria

An initial "baseline" soil vapor sample will be collected of the untreated vapor stream between the exhaust side of the blower and the inlet side of the air purification canisters using a Tedlar air sampling bag. The air bag will be delivered to an ELAP-approved laboratory, where the vapor in the bag will be analyzed for concentrations of VOCs including tetrachloroethylene and its degradation products using EPA Method 8260. In addition, a PID meter will be used to screen the amount of total VOCs in the untreated air stream.

The PID that AEL plans to use during this remediation activity is manufactured by Thermo Environmental, OVM / Datalogger Model 580B. Selected sections of the Model 580B are presented in Appendix 5.

The PID will be used to measure and record total concentrations of VOCs at least once per week during the first month that the system is in full operation. After the first month, PID readings will be collected either monthly or as needed to evaluate the progress of the cleanup activity. In addition to the PID readings, Tedlar air bag samples will be collected on a monthly basis until the laboratory analysis of the samples indicate that a change in sampling schedule is warranted. At that time, the NYSDEC will be petitioned for a change in sampling schedule.

As the operation of the SVE unit progresses, the PID data and the Tedlar air bag sample laboratory analysis will be plotted versus time of operation on graphs. After the concentration of total VOCs in the SVE extraction wells decreases to a near constant or asymptotic level, the system will be pulsed off/on for a period agreeable to NYSDEC. Depending upon the concentration of total VOCs measured after the pulsing activity, the NYSDEC may be petitioned to suspend operation. An asymptotic condition shall be defined as three consecutive quarterly concentrations with a net decrease of 10 percent or less of total VOCs. Graphs of the concentration of total VOCs versus time will be compiled after each round of monthly monitoring.

After the NYSDEC permits the suspension of system operation, a soil boring will be placed adjacent to each shallow SVE extraction well. Soil samples will be collected at 15 to 17-feet, 20 to 22-feet, 25 to 27-feet below grade and analyzed for concentrations of chlorinated VOCs. If the concentration of tetrachloroethylene and its degradation products in these samples do not exceed the NYSDEC TAGM Soil Cleanup Objectives, the system will remain off and the cleanup of the unsaturated zone will be deemed complete. If the levels exceed the Cleanup Objectives, the SVE system will be restarted and the monitoring program will continue. The same criteria will be used to determine when additional soil samples should be collected.

The SVE also serves to capture off gassing contaminants from the AS system. The deep SVE extraction wells are an integral part of the AS system. Even though the criteria described above may be used to shut down the SVE shallow extraction wells, the deep SVE extraction wells will remain active as long as the AS system operates as described in the next section.

7.2 AS System Monitoring and Termination Criteria

The on-site monitoring wells MW#1, MW#2 and MW#3 will serve as compliance points for the operation of the AS system. Prior to start up of the system, "baseline" samples will be collected from these compliance wells.

Once the AS system is placed in full operation, the compliance wells will be sampled on a quarterly basis and analyzed for concentrations of chlorinated VOCs using EPA Method 8260. Graphs of the concentration of total VOCs versus time will be compiled after each round of quarterly sampling.

The AS/SVE system will remain in operation until the groundwater samples from the compliance wells indicate that:

- they meet the SCGs for tetrachloroethylene and its degradation products;
- the laboratory analytical data show that tetrachloroethylene and its degradation products have reached an asymptotic condition and is no longer effectively removing the contaminants of concern; or,

If either of the aforementioned indicators is fulfilled, AEL will petition NYSDEC for authorization to shut down the air sparge system.

8.0 REFERENCES

- AEL, April 26, 2001 Interim Remedial Measure Work Plan
- Dvirka and Bartilucci, December 2000. Remedial Investigation/Feasibility Study Work Plan, Operable Unit II 123 Post Avenue, Westbury, Nassau County, New York.
- AEL, December 2000. Remedial Investigation Report.
- AEL, August 30, 2000. Remedial Investigation/Feasibility Study Work Plan.
- AEL, May 30, 1999. Environmental Investigation of Class V Well.

9.0 HEALTH AND SAFETY PLAN

The health and safety plan currently in effect at the site will continue during the performance of the described work.

10.0 QUALITY ASSURANCE PLAN

The quality assurance plan currently in effect at the site will continue during the performance of the described work.

11.0 CITIZEN'S PARTICIPATION PLAN

The citizens' participation plan currently in effect at the site will continue during the performance of the described work.

12.0 CERTIFICATION

It is hereby certified that the Plan for Air Sparge System, Operable Unit 01 – Soil and Groundwater On-Site for the Westbury Valet Dry Cleaners property dated April 12, 2002 and revised September 12, 2002, has been reviewed and this design and subsequent operation can achieve the cleanup goals identified in 6NYCRR375-1.10c.

Work will be witnessed by a John V. Soderberg, P.E., License Number 49975.

Date: 9/13/02

John V. Soderberg, P.E.
Professional Engineer

Table 1

Summary of VOCs Detected in Groundwater Samples
Collected from Monitoring Wells
at
Westbury Valet Dry Cleaners

Sample Date: March 31, 1999

Sample ID Depth to GW (feet)	MW # 1 31.18	MW #2 33.93	MW #3 33.36		NYSDEC GW Standard
Volatile Organics (EPA Method 601)	ug/L	ug/L	ug/L		ug/L
1,2 Dichloroethene	2	**13**	**98**		5
Trichloroethene	N/A	N/A	N/A		5
Trichloroethylene	3	<1	11		5
Tetrachloroethene	**95**	**690**	**20,000**		5
Methylene Chloride	<1	<1	<1		5
Acetone	N/A	N/A	N/A		50
cis-1-2-Dichloroethene	N/A	N/A	N/A		5
Chloroethane	<1	<1	<1		5
Ethylbenzene	N/A	N/A	N/A		5
Xylene	N/A	N/A	N/A		5
Toluene	N/A	N/A	N/A		5

Notes:
<1: Indicates compound analyzed but not detected
N/A: Not Applicable
ug/L: micrograms per liter or parts per billion
Numbers in bold indicates concentrations exceeding NYSDEC TOGS* levels

*NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values; June 1998

Table 2

Water Table Elevation Survey
Westbury Valet Dry Cleaners
Survey Date October 31, 2001

Well Number	Well Casing Material	Elevation of Well Casing	Depth To Bottom of Well	Depth to Water	Water Height in Well	Volume of Water in Well	Elevation of Groundwater
MW # 1	2-Inch Sch 40 PVC	95.71 Feet	40.45 Feet bgs	34.8 Feet bgs	5.65 Feet	1.2 Gallons	62.60 Feet
MW # 2	2-Inch Sch 40 PVC	98.13 Feet	43.46 Feet bgs	37.3 Feet bgs	6.16 Feet	1.2 Gallons	62.21 Feet
MW # 3	2-Inch Sch 40 PVC	98.06 Feet	43.95 Feet bgs	37.5 Feet bgs	6.45 Feet	1.2 Gallons	62.28 Feet

Notes:
Elevation recorded to nearest 0.01 foot.
Elevation recorded at north edge of PVC casing.

Table 3

Summary of VOCs Detected in Groundwater Samples
Collected from Monitoring Wells
at
Westbury Valet Dry Cleaners

Sample Date: October 3, 2000

Sample ID Depth to GW (feet)	MW # 1 32.95	MW #2 35.42	MW #3 36		NYSDEC GW Standard
Volatile Organics (EPA Method 8260)	ug/L	ug/L	ug/L		ug/L
1,2 Dichloroethene	<60***	<150***	<600***		5
Trichloroethene	<60***	<150***	<600***		5
Trichloroethylene	N/A	N/A	N/A		5
Tetrachloroethene	**1,200**	**5800**	**16,000**		5
Methylene Chloride	**84****	**210****	<600***		5
Acetone	<200***	<500***	<2000***		50
cis-1-2-Dichloroethene	<60***	<150***	<600***		5
Chloroethane	<60***	<150***	<600***		5
Ethylbenzene	<60***	<150***	<600***		5
Xylene	<60***	<150***	<600***		5
Toluene	<60***	<150***	<600***		5

Notes:
<: Indicates compound analyzed but not detected
N/A: Not Applicable
ug/L: micrograms per liter or parts per billion
Numbers in bold indicates concentrations exceeding NYSDEC TOGS* levels
**= Possible contamination from field/laboratory
***= The presence of other target analyte(s) precludes lower detection limits

*NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values; June 1998

Table 4

Summary of VOCs Detected in Groundwater Samples
Collected from Monitoring Wells
at
Westbury Valet Dry Cleaners

Sample Date: July 18, 2001

Sample ID Depth to GW (feet)	MW # 1 33.11	MW #2 35.92	MW #3 35.78		NYSDEC GW Standard
Volatile Organics (EPA Method 8260)	ug/L	ug/L	ug/L		ug/L
1,2 Dichloroethene	10 U	**65**	10 U		5
Trichloroethene	3 J	**11**	**9 J**		5
Trichloroethylene	N/A	N/A	N/A		5
Tetrachloroethene	**90**	**6,200 D**	**23,000 D**		5
Methylene Chloride	10 U	10 U	10 U		5
Acetone	10 UJ	10 UJ	10 UJ		50
cis-1-2-Dichloroethene	N/A	N/A	N/A		5
Chloroethane	10 U	10 U	10 U		5
Ethylbenzene	5 J	10 U	10 U		5
Xylene	2 J	10 U	10 U		5
Toluene	10 U	10 U	10 U		5

Notes:

U: The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

D: The analyte was detected at a secondary dilution factor.

N/A: Not Applicable

ug/L: micrograms per liter or parts per billion

Numbers in bold indicates concentrations exceeding NYSDEC TOGS* levels

*NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values; June 1998

Table 5

Summary of VOCs Detected in Groundwater Samples
Collected from Monitoring Wells
at
Westbury Valet Dry Cleaners

Sample Date: October 31, 2001

Sample ID Depth to GW (feet)	MW # 1 34.8	MW #2 37.3	MW #3 37.5		NYSDEC GW Standard
Volatile Organics (EPA Method 8260)	ug/L	ug/L	ug/L		ug/L
1,2 Dichloroethene	10 U	10 U	10 U		5
Trichloroethene	10 U	10 U	10 U		5
Trichloroethylene	N/A	N/A	N/A		5
Tetrachloroethene	**24**	**26**	**86**		5
Methylene Chloride	10 U	10 U	10 U		5
Acetone	10 UJ	10 UJ	10 UJ		50
cis-1-2-Dichloroethene	N/A	N/A	N/A		5
Chloroethane	10 U	10 U	10 U		5
Ethylbenzene	**6 J**	10 U	10 U		5
Xylene	10 U	10 U	**9 J**		5
Toluene	10 U	10 U	10 U		5

Notes:

U: The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

D: The analyte was detected at a secondary dilution factor.

N/A: Not Applicable

ug/L: micrograms per liter or parts per billion

Numbers in bold indicates concentrations exceeding NYSDEC TOGS* levels

*NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values; June 1998

Table 6

Summary of VOCs Detected in Groundwater Samples
Collected During Hydropunch Activities
at
Westbury Valet Dry Cleaners

Sample Date: October 4, 2000

Sample ID Sample Depth (feet)	GW # 1 76-80	GW # 1.2 55-60	GW # 1.3 36-40	GW # 2 76-80	GW # 2.2 55-60	GW # 2.3 40-44	GW # 3 76-80	GW # 3.2 55-60	GW # 3.3 40-44	NYSDEC GW Standard
Volatile Organics (EPA Method 8260)	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,2 Dichloroethene	<3	<3	<3	<3	<3	<150***	<3	<3	<3	5
Trichloroethene	4	<3	<3	<3	<3	<150***	<3	<3	<3	5
Trichloroethylene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
Tetrachloroethene	4	**6**	**64**	**23**	**24**	**3,700**	4	**8**	**16**	5
Methylene Chloride	<3	3**	4**	**6****	**6****	**250****	<3	<3	<3	5
Acetone	<10	<10	<10	<10	<10	<500***	<10	<10	22**	50
cis-1-2-Dichloroethene	**8**	<3	<3	<3	<3	<150***	<3	<3	<3	5
Chloroethane	<3	<3	<3	<3	<3	<150***	<3	<3	<3	5
Ethylbenzene	<3	<3	<3	<3	<3	<150***	<3	<3	<3	5
Xylene	<3	<3	<3	<3	<3	<150***	<3	<3	**8**	5
Toluene	<3	<3	<3	<3	<3	<150***	<3	<3	<3	5

Notes:
<: Indicates compound analyzed but not detected N/A: Not Applicable
ug/L: micrograms per liter or parts per billion
Numbers in bold print indicates concentrations exceeding NYSDEC TOGS* levels
**= Possible contamination from field/laboratory
***= The presence of other target analyte(s) precludes lower detection limits
*NYSDEC Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values; June 1998

Table 7

Summary of VOCs Detected in Groundwater Samples
Collected from Monitoring Wells
at
Westbury Valet Dry Cleaners

Sample Date: June 27, 2002 (by NYSDEC)

Sample ID Depth to GW (feet)	MW # 1 37.60	MW #2 40.56	MW #3 40.16		NYSDEC GW Standard
Volatile Organics	ug/L	ug/L	ug/L		ug/L
Tetrachloroethene	**8J**	**7J**	4J		5

Notes:
J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ug/L: micrograms per liter or parts per billion

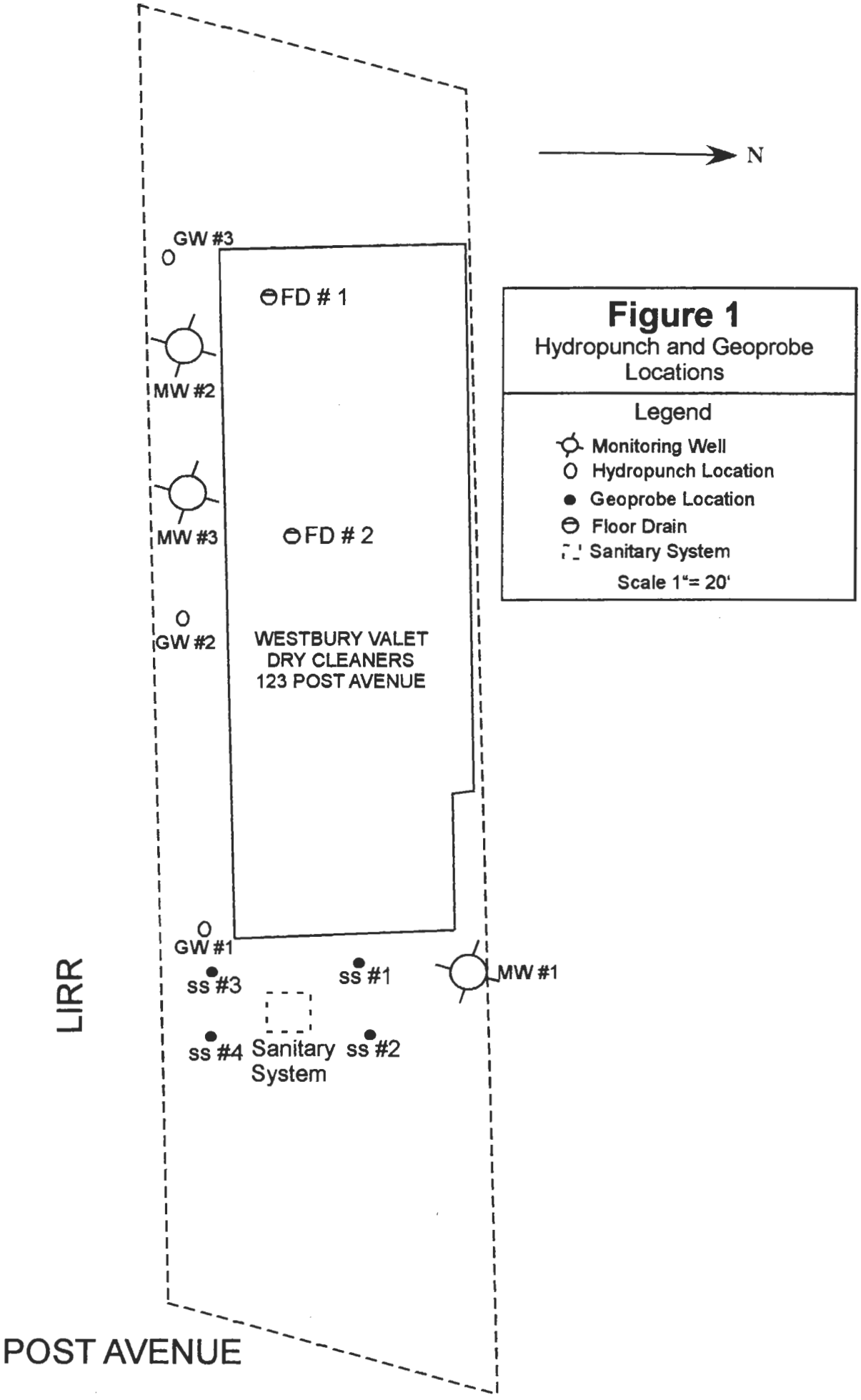
Numbers in bold print indicate concentrations exceeding NYSDEC TOGS* levels

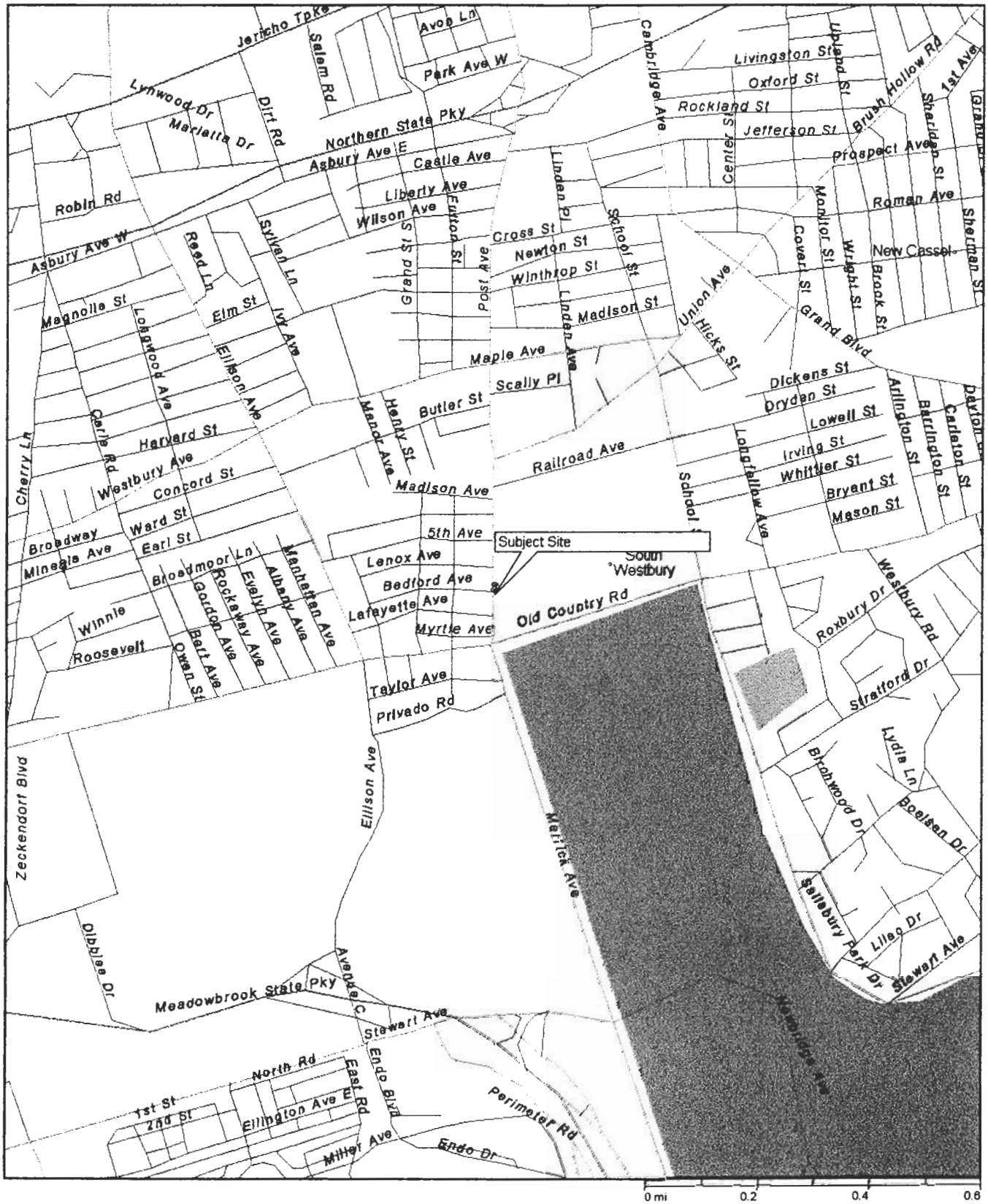
*NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values; June 1998

Table 8

Proposed On-Site Air Sparge
and Soil Vapor Extraction Well Design
Westbury Valet Dry Cleaners

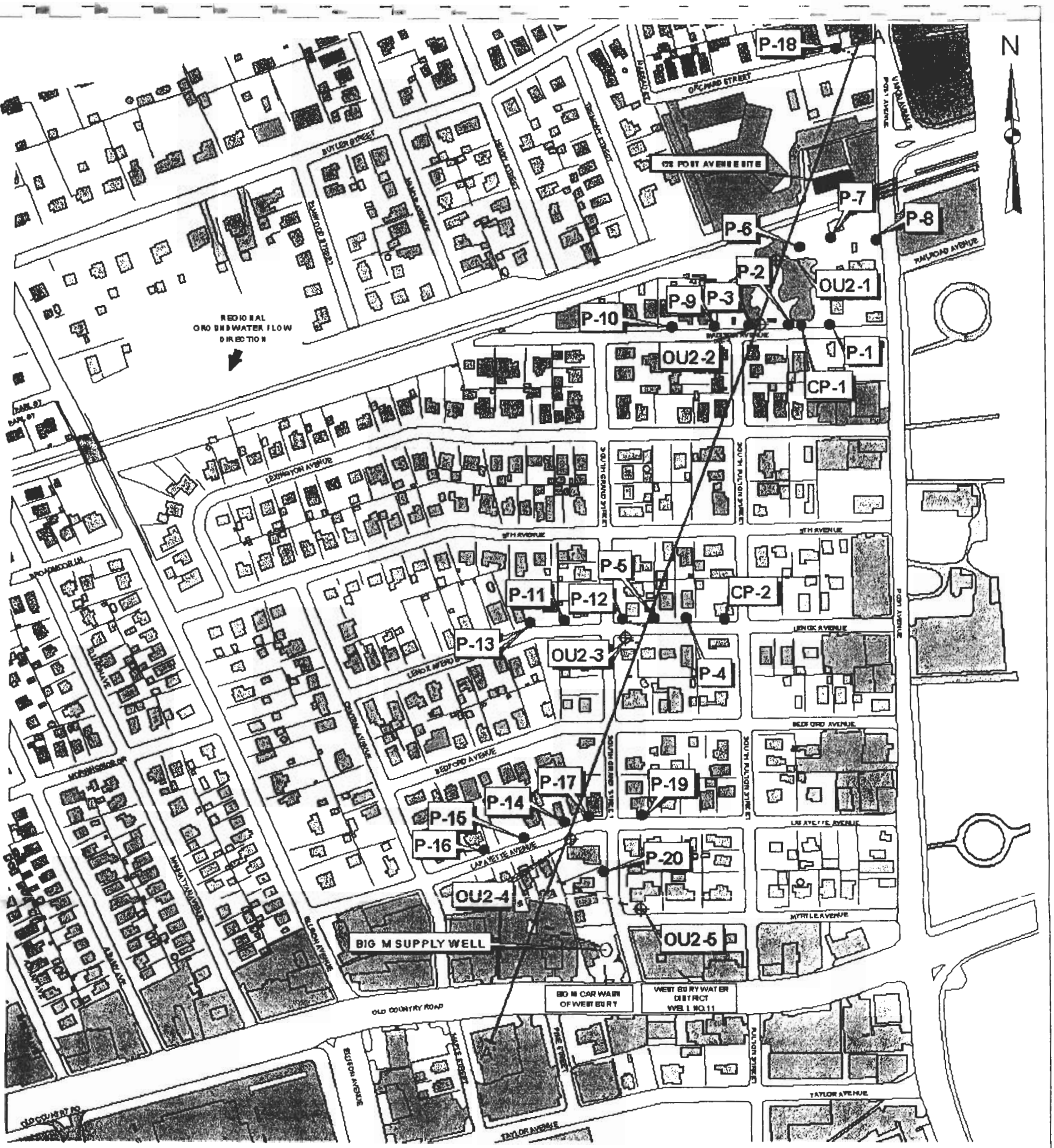
Well ID #	Vapor or Sparge	Total Depth	Screen Interval (s)	Slot Size	Intermediate Seals/Depths
AS # 1	Sparge	60 ft bgs	58-60 ft	#10	# 0 Morie/ 60-56 ft # 00 Morie/ 56-54 ft Bentonite Pellets/ 54-52 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 52-30 ft
RW1-D	Vapor	30 ft bgs	20-30 ft	# 10	# 0 Morie/ 30-18 ft # 00 Morie/ 18-16 ft Bentonite Pellets/ 16-14 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 14-12 ft Bentonite Slurry/ 12-3ft Clean Sand to Grade
AS # 2	Sparge	60 ft bgs	58-60 ft	# 10	# 0 Morie/ 60-56 ft # 00 Morie/ 56-54 ft Bentonite Pellets/ 54-52 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 52-30 ft
RW2-D	Vapor	30 ft bgs	20-30 ft	# 10	# 0 Morie/ 30-18 ft # 00 Morie/ 18-16 ft Bentonite Pellets/ 16-14 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 14-12 ft Bentonite Slurry/ 12-3ft Clean Sand to Grade


N
GW #3
FD # 1
MW #2
MW #3
FD # 2
GW #2
WESTBURY VALET
DRY CLEANERS
123 POST AVENUE
GW #1
ss #3
ss #1
MW #1
LIRR
ss #4
Sanitary
System
ss #2
POST AVENUE
Figure 1
Hydropunch and Geoprobe Locations
Legend
Monitoring Well
Hydropunch Location
Geoprobe Location
Floor Drain
Sanitary System
Scale 1"= 20'



Streets Plus

Figure # 2
Westbury Valet Dry Cleaners



BASE MAP COPYRIGHT, 1983, COUNTY OF NASSAU, NY.

LEGEND

- CP-1 ● SOIL CONDUCTIVITY PROBE HOLE LOCATION AND DESIGNATION
- P-1 ● GROUNDWATER PROBE HOLE SAMPLE LOCATION AND DESIGNATION
- OU2-1 ⊕ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- A|—|A' LINE OF GEOLOGIC CROSS SECTION

200 0 200 Feet

123 POST AVENUE RI/FS OPERABLE UNIT 2
WESTBURY, NEW YORK

LOCATIONS OF SUBSURFACE DATA POINTS

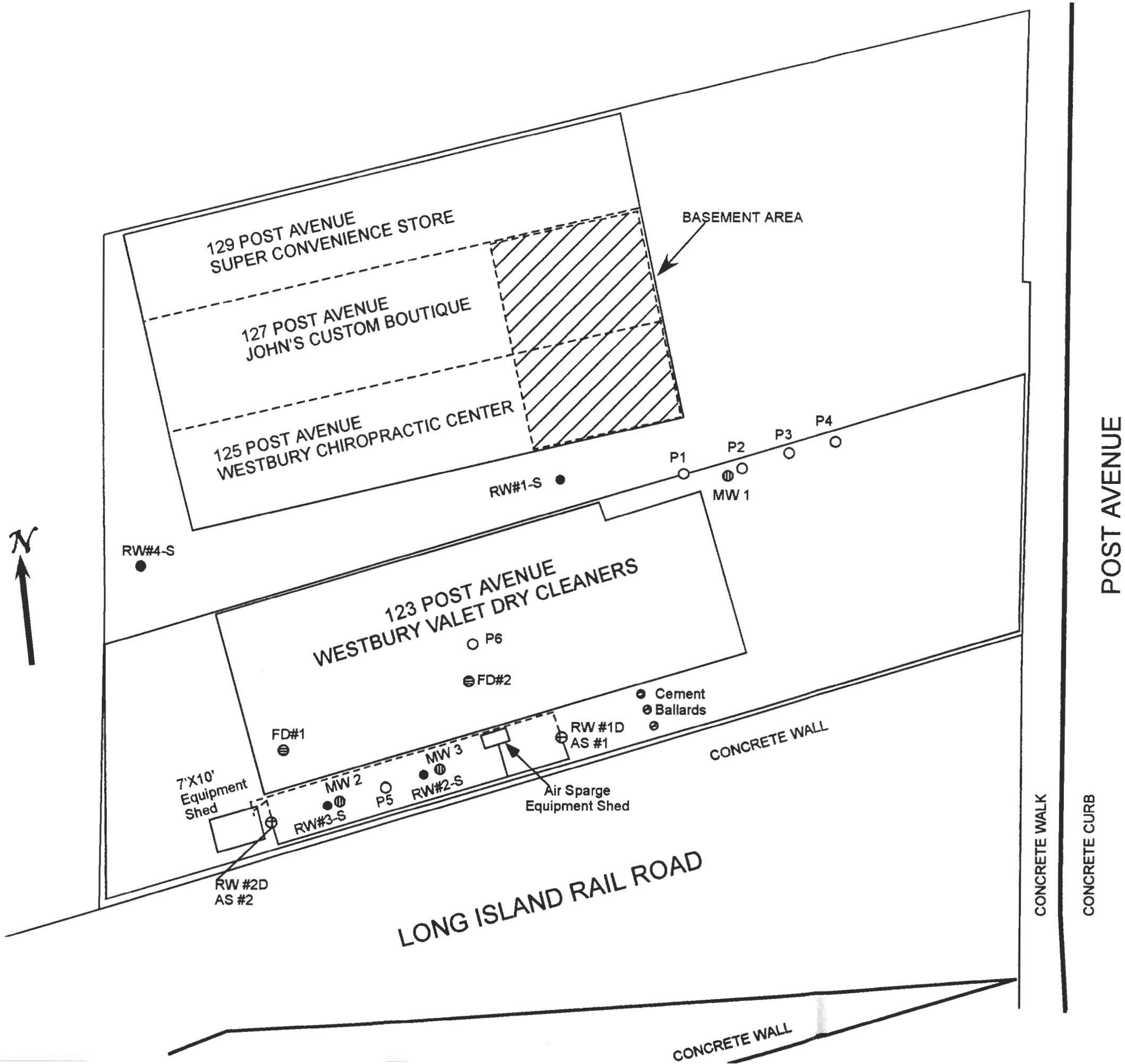
Figure 3

Dvirka and Bartilucci CONSULTING ENGINEERS

ENGWORK\1620\KEYSPAN\PHOTOS\HALESITE\ARCVIEW\FILES\1680-123POSTAVE

Figure 5

Proposed Air Sparge and
Soil Vapor Extraction Wells
Westbury Valet Dry Cleaners



Legend

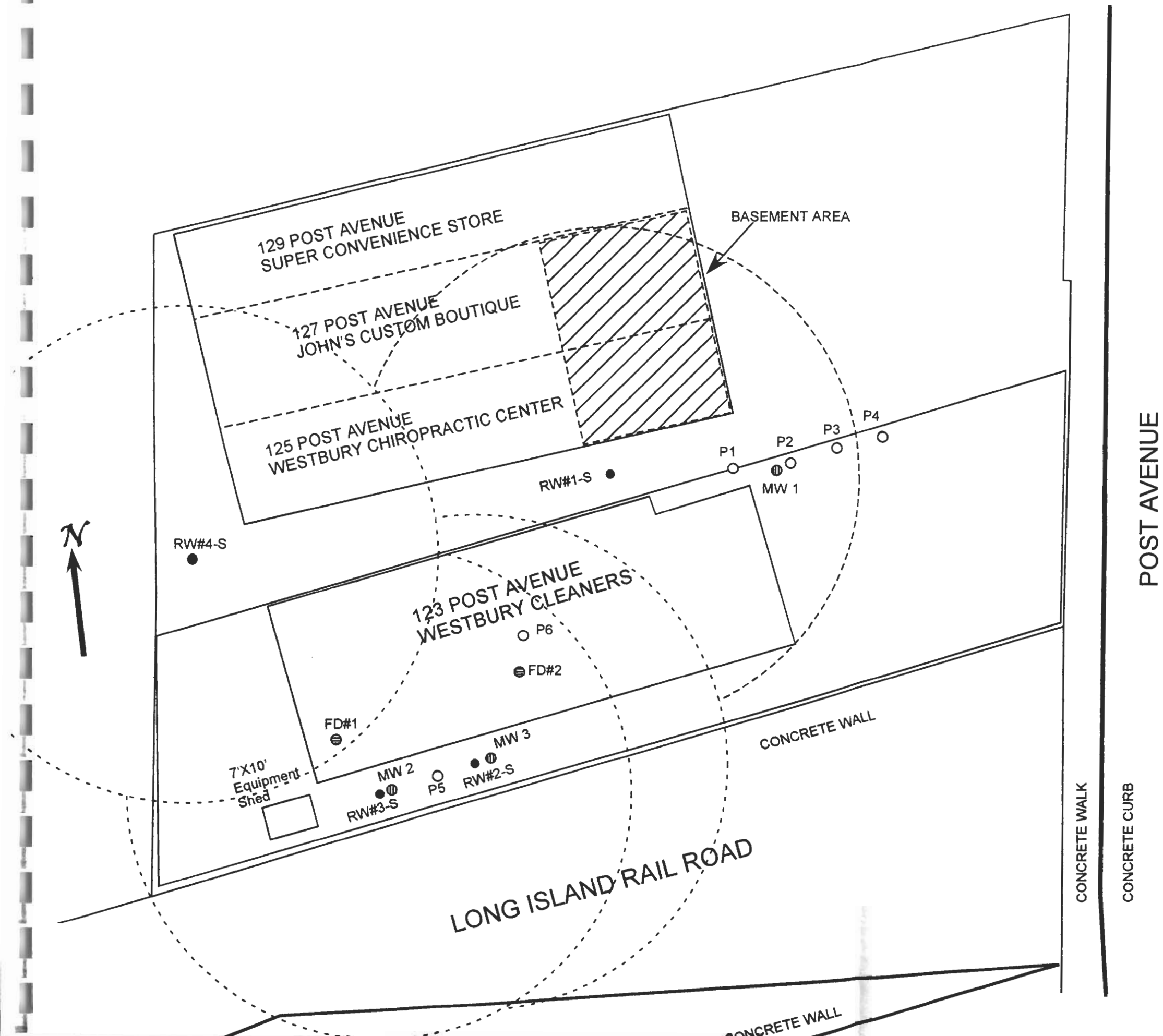
- Remediation Well
- Floor Drain
- Monitoring Well
- Basement Area
- Vapor Monitoring Probe
- Proposed Air Sparge and Deep Soil Vapor Extraction Well
- Cement Ballards
- Proposed SVE Piping
- Proposed AS Piping

Scale: 1 inch = 20 feet

NOTE:
Shallow Remediation Wells
Screened from
10- 20 feet Below Grade
Vapor Monitoring Probes Screened
10-15 feet Below Grade
Deep Remediation Wells Screened
From 20-30 feet Below Grade
Air Sparge Wells Screened From
58-60 feet Below Grade

Figure 6

Radius of Influence
(for 50-feet ROI)
Westbury Valet Dry Cleaners



Legend

- Remediation Well
- Floor Drain
- Monitoring Well
- Radius of Influence
- Basement Area
- Vapor Monitoring Probe

Scale: 1 inch = 20 feet

NOTE:
Remediation Wells Screened from 10- 20 feet Below Grade
Vapor Monitoring Probes Screened From 10-15 feet Below Grade

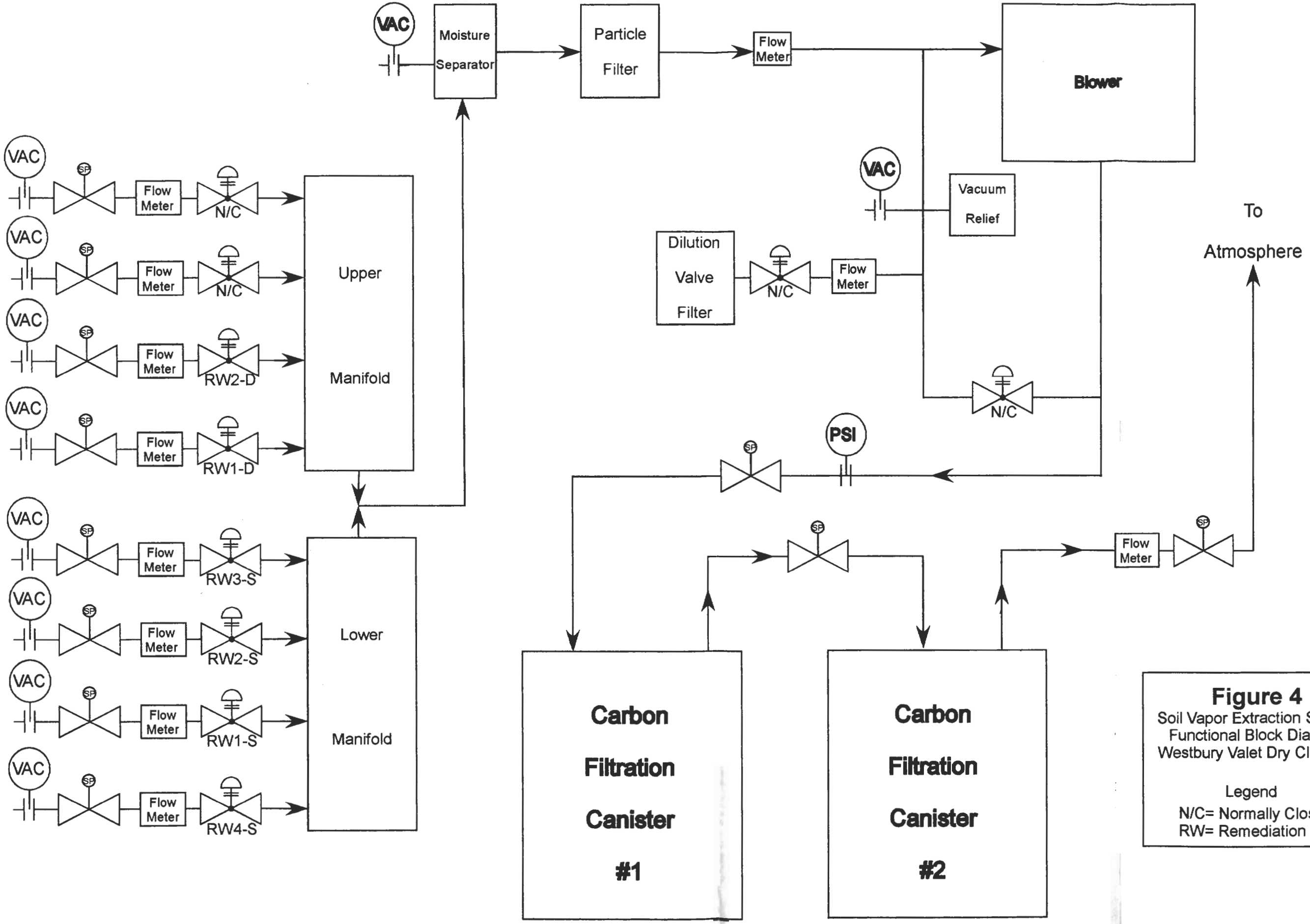
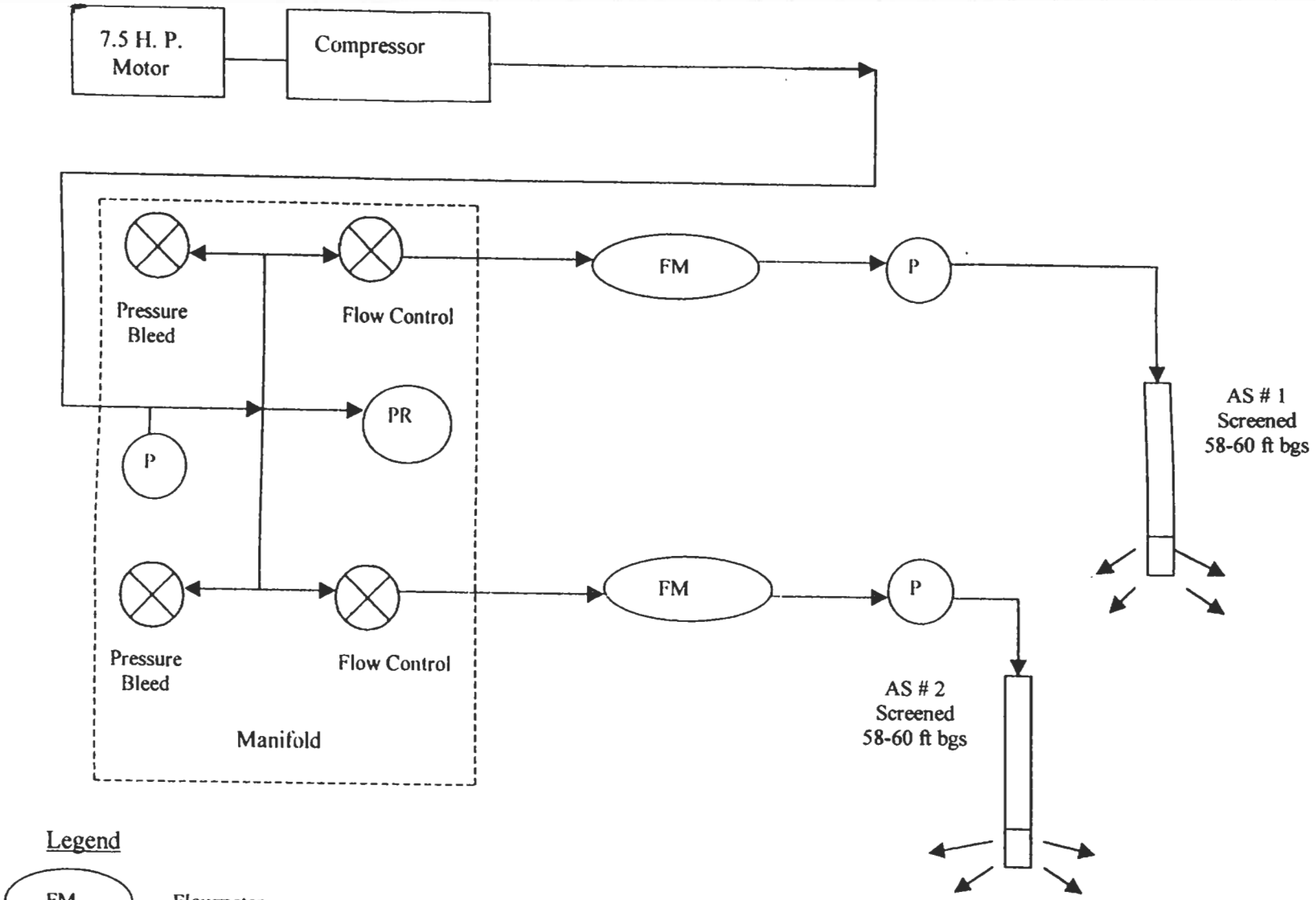


Figure 4
Soil Vapor Extraction System
Functional Block Diagram
Westbury Valet Dry Cleaners

Legend
N/C= Normally Closed
RW= Remediation Well



Legend

FM — Flowmeter

PR — Pressure Relief Valve

P — Pressure Gauge

PVC Ball Valve

Figure 7
Proposed Air Sparge
Functional Block Diagram
Westbury Valet Dry Cleaners

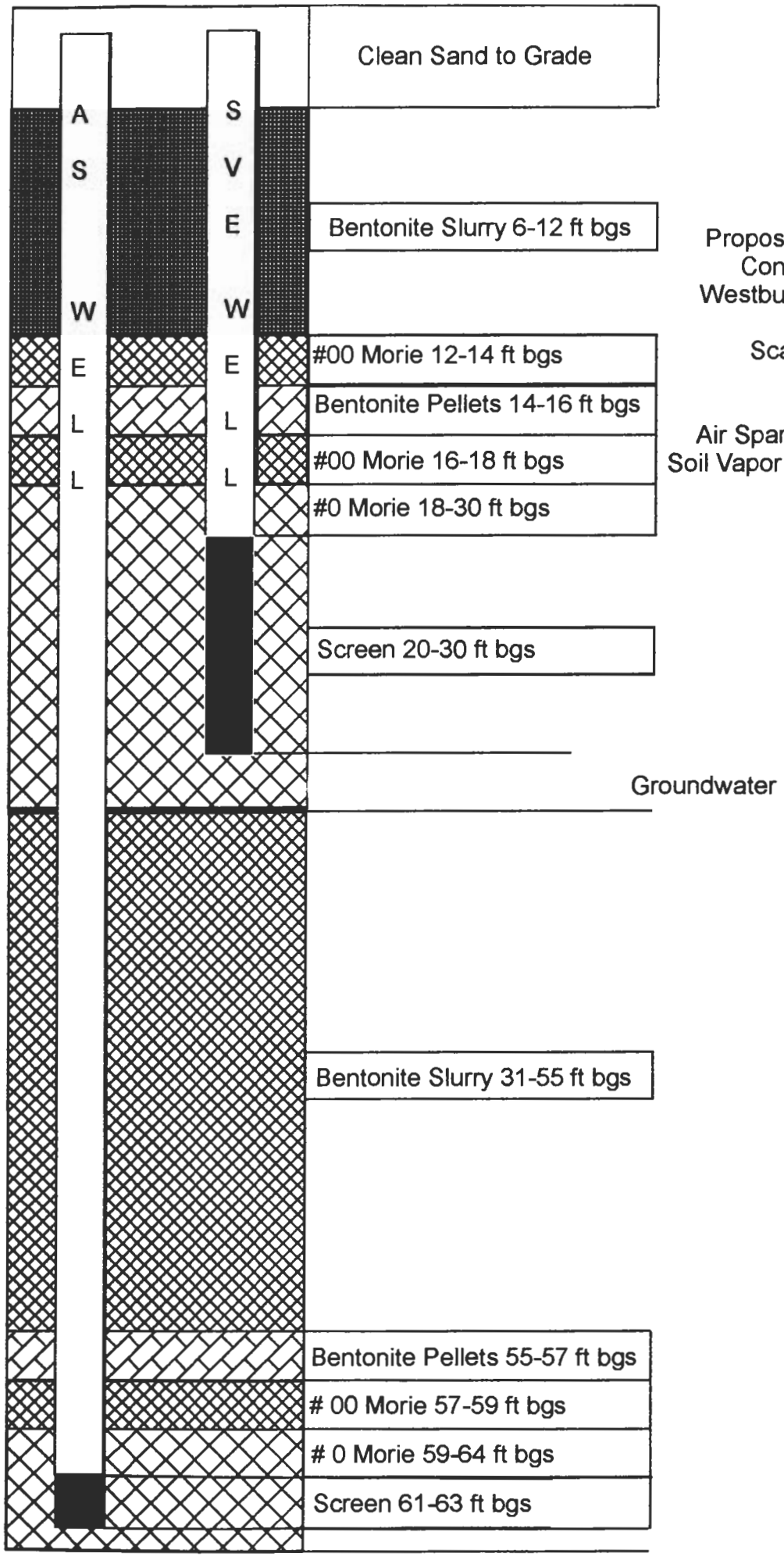


Figure 8

Proposed SVE and AS Well Construction Diagram
Westbury Valet Dry Cleaners

Scale 1inch = 6 feet

Air Sparge Well Diameter= 2"
Soil Vapor Extraction Diameter= 4"

ANSON ENVIRONMENTAL LTD.

771 New York Aven
Huntington, New York 117
516-351-35
Fax: 516-351-36

Environmental Investigation of Class V Well
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

May 30, 1999

"Your Environmental Partner"

Environmental Investigation of Class V Well
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

May 30, 1999

Environmental Investigation of Class V Well
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

May 30, 1999

1.0 EXECUTIVE SUMMARY

Nassau County Department of Health identified two floor drains at Westbury Valet Cleaners and required the sediment to be sampled. Because the sediment in the drains was contaminated, some of it was removed using a vactor truck. However, not all the contamination could be removed from floor drain #2. Therefore, on March 31st, soil samples were collected from 10-11 feet, 20-22 feet, 30-32 feet and 36-40 feet below grade in vicinity of floor drain #2. The four samples were analyzed via EPA method 8260. The concentration of tetrachloroethene (PCE) declined with increases in depth.

On March 17, 1999, three groundwater monitoring wells were installed: one up gradient (MW#1) and one down gradient of each of the floor drains. MW#2 was located down gradient of floor drain #1 and MW#3 was located down gradient of floor drain #2. On March 31, groundwater samples were collected from each of the monitoring wells and submitted for laboratory analysis via EPA method 601. The down gradient water samples had higher concentrations of PCE.

The next step in the remediation of the site is the installation of a soil vapor extraction system to cleanup the soils in the vicinity of floor drain #2. The installation of the system will begin with the calculation of the radius of installation of influence of a 2 horsepower blower connected to an extraction well to be located outside the building in the vicinity of floor drain #2.

2.0 FIELD INVESTIGATIONS

2.1 OFF SITE GROUNDWATER SAMPLING

Apex Environmental, Inc. of Reading, Pennsylvania performed groundwater investigation south of the Long Island Rail Road tracks at 117 Post Avenue, Westbury in October 1997 (Appendix 1) that showed elevated concentrations of PCE in the groundwater down gradient of Westbury Valet Cleaners. The direction of groundwater flow was toward the southwest.

2.2 ONSITE SOIL SAMPLING

One soil boring was installed through the former location of Floor Drain #2. Using a Geoprobe, soil samples were collected at four depths 10-11 feet, 20-22 feet, 30-32 feet and 36-40 feet below grade. The soil sample collected at the 36-40 feet below grade level was collected in groundwater. Each sample was submitted to EcoTest Laboratories for analysis via EPA method 8260. Table 1 summarizes the volatile organic compounds detected above the laboratory detection limit. Actual laboratory data sheets are in Appendix 2.

The soils at each depth were described as:

10-11 feet	yellow coarse sand
20-22 feet	yellowish brown coarse sand
30-32 feet	yellowish coarse sand

Table 1 Volatile organic compounds in soil samples from floor drain #2.

Compounds	10-11 feet	20-22 feet	30-32 feet	36-40 feet	Standard*
tetrachloroethene	270,000 ppb	53 ppb	17 ppb	62 ppb	1,400 ppb
1,4-dichlorobenzene	<1,000 ppb	2 ppb	<1 ppb	<1 ppb	
1,2,4-trichlorobenzene	<1,000 ppb	52 ppb	<1 ppb	<1 ppb	
naphthlene	<1,000 ppb	1 ppb	<1 ppb	<1 ppb	
hexachlorobutadiene	<1,000 ppb	3 ppb	<1 ppb	<1 ppb	
PID headspace reading	1,192 ppm	1,928 ppm	231 ppm	no reading	

Field headspace readings were collected from the soils using a Photoionization Detector (PID) that was calibrated using isobutylene gas.

2.3 ONSITE GROUNDWATER INVESTIGATION

On March 17, 1999, three two-inch diameter groundwater monitoring wells were installed by Miller Environmental Group of Calverton, New York. Each well was installed to a depth of 45 feet below grade using hollow stem augers. Each well was constructed of ten feet of 20 slot screen and the annular space around the screened interval was gravel packed using clean #OO morie sand. MW#1 was installed up gradient of the site while MW#2 and MW#3 were installed down gradient of floor drains #1 and #2, respectively. The drill cuttings from the well installation were placed in 55-gallon steel DOT drums.

The three wells were installed such that the bottom of the wells were 40.45 feet below grade for MW#1, 43.46 feet for MW#2 and 43.95 feet for MW#3.

One week following well installation, the three wells were developed by removing 40 gallons (MW#1), 50 gallons (MW#2) and 45 gallons (MW#3). The development water was placed in clean 55-gallon drums where the water was stored. The water from each drum was filtered using a Carbtrol L-1 Water Purification Canister containing 200

pounds of virgin carbon. The development water was filtered using the Carbtrol filter and was analyzed via EPA method 601. The filtered water contained 1 part per billion of PCE (Appendix 1) and Nassau County Department of Public Works authorized the discharge of the filtered water into the sewers (Appendix 3).

The well construction logs are in Appendix 4.

Depth to water measurements were taken prior to development and then again prior to groundwater sampling on March 31, 1999. These samples were placed on ice and delivered to EcoTest Laboratories of North Babylon, New York. The groundwater samples were analyzed via EPA method 601. Table 2 summarizes the volatile organic compounds detected above the laboratory detection limit. Actual laboratory data sheets are in Appendix 2.

Table 2 Halogenated volatile organic compounds in groundwater.

Compound	MW#1	MW#2	MW#3	Groundwater Standard
1,2-dichloroethene	2 ug/L	13 ug/L	98 ug/L	5 ug/L
trichloroethylene	3 ug/L	<1 ug/L	11 ug/L	5 ug/L
tetrachloroethene	95 ug/L	690 ug/L	20,000 ug/L	5 ug/L
Depth to Water on March 31, 1999	31.18 feet	33.93 feet	33.76 feet	

Based on site-specific conditions, the groundwater flow was calculated to be in a southerly direction.

3.0 INTERPRETATION OF LABORATORY DATA

Soil Sampling – The vertical extent of PCE contamination in floor drain #2 was determined to be approximately 20 feet below grade. The soil headspace field readings and laboratory data were used to make this determination which is based on the New York State TAGM allowable limit of 1,400 parts per billion in soil.

Groundwater – All three of the groundwater samples collected exceed the Class GA groundwater standard for PCE. The down gradient water samples have higher concentrations of PCE than the up gradient. However, there may be an up gradient source of groundwater contamination.

4.0 REMEDIAL ACTIVITIES

4.1 Soils

The contaminated soils around floor drain #1 have been excavated and the remaining soils are clean as was confirmed by laboratory analysis of the endpoint sample. In the

area of floor drain #2, soil has been excavated from the floor to approximately six feet deep. Additional soils cannot be excavated because of soil conditions under the building and the proximity of heavy machinery and the outside wall. Further excavation would threaten the structure and heavy machinery being supported by the floor.

Floor drain #2 has been taken out of service by backfilling it with clean soil and repairing the flooring with concrete.

Soil Vapor Extraction System - To remediate the soils in the vicinity of floor drain #2, AEL proposes a soil vapor extraction system (SVES) that would be screened in the top twenty feet of soil below the floor in the building. The radius of influence is typically 15 feet in sandy soil similar to those that are present on site. To calculate this radius of influence, an on-site pilot test will be conducted.

A pilot test will be conducted for the soil vapor extraction system. The test will be conducted using a 2-horsepower electric regenerative blower connected to a new extraction well that will be installed in the vicinity of MW#2. This extraction well will be installed on the exterior of the building in the vicinity of MW#2 and will be screened between 5 feet and 20 feet below grade. Piezometers will be also be installed 10, 15, 20 and 30 feet to the east of the extraction well. The piezometers will be screened at the same depth as the extraction well and vacuum readings will be recorded using a digital manometer. Vacuum readings equal to or greater than .10 inches of water will be considered to represent an area within the radius of influence of the extraction well.

Once the radius of influence has been calculated, it will be compared to the distance that floor drain #2 is from the extraction well and the horizontal extent of soil contamination. If the extent of contamination exceeds the radius of influence of the soil vapor extraction system, then additional extraction wells will be installed to address the soil contamination.

4.2 Groundwater

The groundwater conditions on-site have not been adequately described to design a groundwater remediation system. The vertical extent of contamination has not been investigated and needs to be prior to remediation system design. The vertical extent of contamination needs to be investigated by installing deeper wells. These wells will be used to sample the water at deeper depths and determine the direction of groundwater flow direction.

5.0 SCHEDULE

The pilot test of the soil vapor extraction system will be conducted within the next thirty days. Once that test has been completed, the system will be permanently installed to begin remediation of the soil contamination. The Nassau County Department of Health

and USEPA will be notified ten working days in advance of the performance of any field investigations.

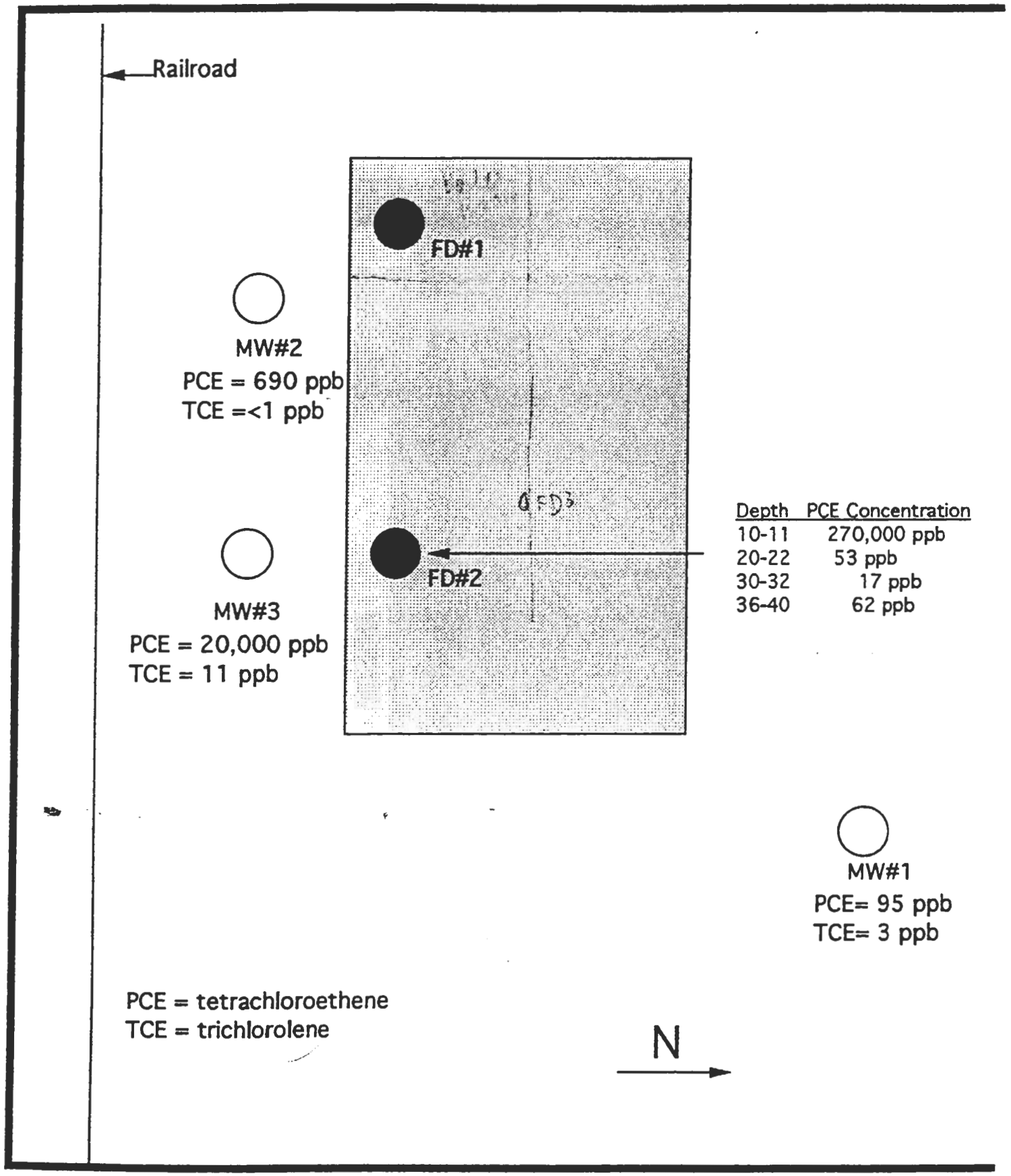


Figure 1 Site Location Map
Westbury Cleaners
123 Post Avenue
Westbury, NewYork

not to scale

Appendix 1

Apex Environmental
October 1997 Environmental Study

Apex environmental, inc.

220 North Park Road
Reading, PA 19610
Telephone (610) 371-84
Facsimile (610) 371-90

GROUND WATER INVESTIGATION

117 Post Avenue
Village of Westbury, Nassau County, New York

SUBMITTED TO:

Mr. Alfred H. Hicks
H.W. 117 Post Corporation
P.O. Box 648
Westbury, New York 11590

PREPARED BY:

Mark E. Zunich
Geologist

REVIEWED BY:

James F. Mattern, C.E.I., P.G.
Senior Environmental Geologist
Regional Manager

Job 9952.001
October 1997

1.0 Introduction

Apex Environmental, Inc. has completed a ground water investigation at 117 Post Avenue in the Village of Westbury, Nassau County, New York (Figure 1). The investigation included the installation, sampling, and surveying of seven monitoring wells to determine the environmental quality and flow direction of the local ground water. Three monitoring wells were installed and sampled during the initial phase of the investigation, conducted during a Phase I Environmental Site Assessment. Based on a review of the ground water analyses of the three wells a second phase of the investigation was conducted, which included the installation and sampling of an additional four wells to further define the environmental quality of the local ground water.

2.0 Ground Water Investigation

2.1 Monitoring Well Installation Procedures

On July 31, 1997 Apex personnel supervised the installation and development of three, four-inch diameter PVC ground water monitoring wells, identified as MW-1, MW-2, and MW-3. The monitoring wells were installed as part of a Phase I Environmental Site Assessment to identify any possible ground water contamination, and determine the local ground water gradient. On September 22 and 23, 1997 Apex personnel returned to the site to supervise the installation of four additional four-inch diameter PVC ground water monitoring wells, identified as MW-4, MW-5, MW-6, and MW-7, based on the contaminant exceedences discovered in MW-1, MW-2, and MW-3, All drilling activities and well development procedures were conducted by Tri-State Drilling Technologies, Inc., Garden City, New York. Ground water monitoring well logs are provided in Appendix A.

The seven monitoring wells were strategically located to intercept and identify any ground water contamination associated with the subject site or entering the subject property from off-site (Figure 2). During monitoring well installation procedures the drill cuttings were screened using visual and olfactory senses and a photoionization detector (PID). No evidence of contamination was observed. All ground water monitoring well installation equipment was decontaminated between each well installation utilizing a high pressure washer/steam cleaner utilizing Liquinox.

2.2 Ground Water Sampling Procedures

On August 8, 1997, Apex personnel purged and sampled monitoring wells MW-1, MW-2, and MW-3. On October 1, 1997, Apex personnel returned to the site and purged and sampled all seven ground water monitoring wells. Utilizing a portable electric powered submersible pump

outfitted with 1" polyethylene well tubing, each monitoring well was purged a minimum of three well volumes, and purge water was monitored for pH, conductivity, and temperature. Purging continued until these geochemical parameters stabilized. The purge water was discharged to the surface. The centrifugal pump was decontaminated between each well with a Liquinox wash and tap water rinse. New polyethylene tubing was utilized for each well.

Clean, disposable, dedicated bailers were used for the collection of ground water samples. Upon collection, each water sample was placed in a laboratory supplied glass sample jar, sealed with electrical tape, labeled with information regarding project site, monitoring well identification, and sample date, and stored in an iced cooler, pending shipment to GLA Laboratories located in King of Prussia, Pennsylvania, a New York State Department of Health-certified laboratory.

Ground water samples collected on August 8, 1997 were submitted for volatile organics by gas chromatograph/mass spectrometer using EPA Method SW-846 8260 and polynuclear aromatic hydrocarbons by high performance liquid chromatograph and florescents using EPA Method SW-846 8310 analysis. Monitoring wells MW-1 and MW-2 were also analyzed for organochlorine pesticides using EPA Method SW-846 8081 and chlorinated herbicides using EPA Method SW-846 8150 analyses. Ground water samples collected on October 1, 1997 were submitted for volatile organic compounds using EPA Method SW-846 5030/8021.

2.3 Laboratory Analytical Results

Laboratory analytical reports for the August 8, 1997 sampling event indicated the presence of tetrachloroethene (PCE) at levels exceeding the USEPA and New York State Department of Environmental Conservation (NYSDEC) drinking water regulations and health advisories maximum contaminant limit (MCL) of 5.0 micrograms per liter (µg/L). Laboratory analysis also reported the presence of benzo(a)anthracene and benzo(a)pyrene in MW-3 at concentrations of 0.011 µg/L and 0.019 µg/L, respectively. The reported concentrations of benzo(a)anthracene and benzo(a)pyrene do not exceed the USEPA regulatory limit (benzo(a)pyrene MCL of 0.2 µg/L) or USEPA guidance value (currently no MCL or health advisory limit for benzo(a)anthracene); however, these concentrations exceed NYSDEC's MCLs. In addition, laboratory analysis reported cis 1,2-dichloroethene in MW-2; however, the reported concentration was below the USEPA and NYSDEC MCLs. Organochlorine pesticides and chlorinated herbicides were not detected in any of the monitoring wells.

Laboratory analysis of the ground water samples collected on October 1, 1997 reported all seven monitoring wells contain PCE at levels exceeding the USEPA and NYSDEC MCLs of 5.0 µg/L. Laboratory analysis also reported the presence of isopropylbenzene in MW-2 and MW-3 at concentrations of 0.94 µg/L and 0.89 µg/L, respectively. Both concentrations are below the NYSDEC MCL of 5 µg/L for isopropylbenzene. Currently, no USEPA MCL exists for isopropylbenzene. Trichloroethene (TCE) was also reported in MW-2, MW-3, MW-5, MW-6, and MW-7; only MW-5 contained a TCE concentration above the USEPA and NYSDEC MCL of 5 µg/l (33µg/L). All other TCE concentrations are within the USEPA and NYSDEC limits. Laboratory analytical results are summarized in Table 1. Laboratory analytical data sheets are provided in Appendix B.

TABLE 1
Ground Water Laboratory Analytical Results
117 Post Avenue, Village of Westbury,
Town of North Hempstead, Nassau County, New York

Monitoring Well	Sample Date	Organochlorine Pesticides	Chlorinated Herbicides	Polynuclear Aromatic Hydrocarbons	Volatile Organics
Units	na	µg/L	µg/L	µg/L	µg/L
NYSDEC MCL	na	na	na	Benzo(a)anthracene = 0.002 Benzo(a)pyrene = 0.002	cis 1,2-Dichloroethene = 7 Isopropylbenzene = 5 Trichloroethene = 5 Tetrachloroethene = 5
USEPA MCL	na	na	na	Benzo(a)anthracene = no limit established Benzo(a)pyrene = 0.2	cis 1,2-Dichloroethene = Trichloroethene = 5 Tetrachloroethene = 5 Isopropylbenzene = no limit established
MW-1	August 8, 1997	Non-Detect	Non-Detect	Non-Detect	**Tetrachloroethene = 1**
	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	**Tetrachloroethene = 1**
MW-2	August 8, 1997	Non-Detect	Non-Detect	Non-Detect	cis 1,2-Dichloroethene = **Tetrachloroethene = 1**
	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	Isopropylbenzene = 0.9 **Tetrachloroethene = 1.** Trichloroethene = 1.7
MW-3	August 8, 1997	Not Analyzed	Not Analyzed	**Benzo(a)anthracene = 0.011** **Benzo(a)pyrene = 0.019**	**Tetrachloroethene = 1**
	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	Isopropylbenzene = 0.8 **Tetrachloroethene = 1** Trichloroethene = 2.
MW-4	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	**Tetrachloroethene =**
MW-5	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	**Tetrachloroethene = 1:** **Trichloroethene = 3**
MW-6	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	**Tetrachloroethene =** Trichloroethene = 1
MW-7	October 1, 1997	Not Analyzed	Not Analyzed	Not Analyzed	**Tetrachloroethene =** Trichloroethene = 0.

na = Not applicable.

BOLD = Exceeds the most restrictive regulatory limit.

4.0 Ground Water Gradient

Upon completion of the monitoring well installations, Apex personnel surveyed the ground water monitoring wells on the subject property and obtained the relative elevations for the top of casing for each well. Utilizing this information and the depth-to-water readings obtained during the October 1, 1997 sampling event, Apex determined that ground water flows in a southwesterly direction beneath the subject property at a gradient of approximately 0.002 feet per foot (ft/ft). The local ground water gradient is shown in Figure 3. All ground water gradient data is summarized in Table 2.

TABLE 2
Relative Ground Water Elevation Data - October 1, 1997
117 Post Avenue, Village of Westbury,
Town of North Hempstead, Nassau County, New York

Ground Water Monitoring Well	Sample Date	Top-of-Casing Relative Elevation	Depth-to-Water	Relative Ground Water Elevation
MW-1	October 1, 1997	95.29	29.67	65.62
MW-2	October 1, 1997	95.77	30.13	65.64
MW-3	October 1, 1997	96.14	30.73	65.41
MW-4	October 1, 1997	95.80	30.08	65.72
MW-5	October 1, 1997	97.04	31.57	65.47
MW-6	October 1, 1997	97.35	32.16	65.19
MW-7	October 1, 1997	95.79	30.27	65.52

5.0 Conclusions

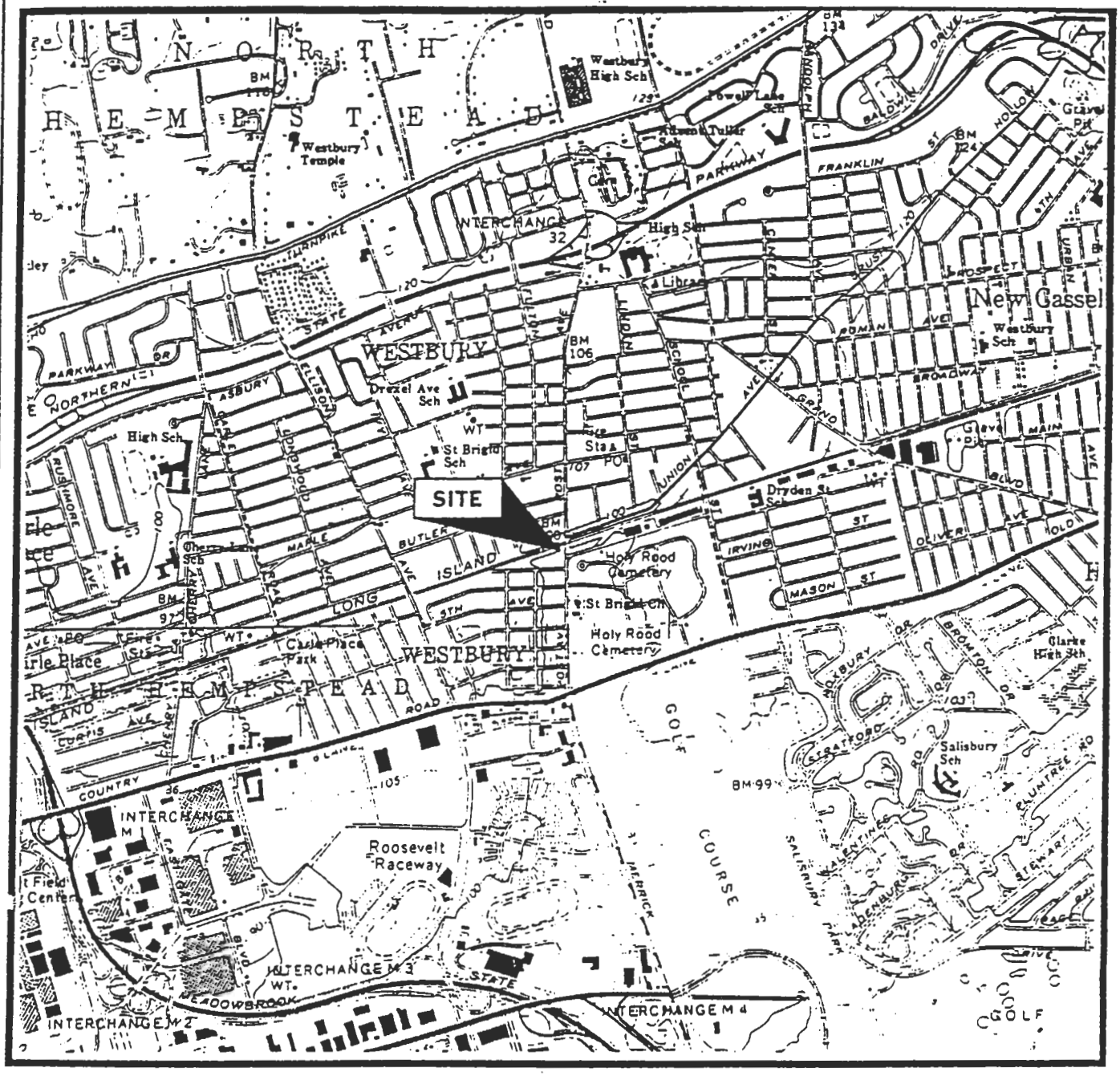
Laboratory analytical results indicate the local ground water beneath the subject property contains levels of PCE and TCE above the USEPA and NYSDEC regulatory standards. A ground water contaminant concentration map (Figure 3) indicates that a PCE contaminant plume is entering the subject property form the north, in the vicinity of MW-5 and MW-2, and follows the local gradient in a southwesterly direction across the site, impacting MW-3, MW-6, and MW-7. Dispersion of the contaminants is also impacting MW-1 and MW-4.

A site history investigation conducted during a Phase I Environmental Site Assessment indicated the subject property was utilized as a coal yard from prior to 1920 through 1983. Currently, the subject property contains a swimming pool supply company, a building material and landscaping business, a construction company, and a second landscaping business. None of the former or present businesses are known to have utilized materials containing the discovered contaminants. However, the Phase I also indicated the presence of a dry cleaning business (Westbury Valet Dry Cleaners) currently located directly north and upgradient of the subject property. Apex personnel reviewed the Triennial Certificate of Operation issued to the Westbury Valet Dry Cleaners, which indicates the facility is permitted to store 100-gallons of PCE. A dry cleaning establishment has reportedly been at this location since the 1950's. Based on the local ground water gradient, and the shape of the PCE plume (Figure 4), Apex concludes the most likely source of the PCE ground water contamination under the subject site is the Westbury Valet Dry Cleaners facility located immediately north of the subject site at 123 Post Avenue.

The benzo(a)anthracene and benzo(a)pyrene detected in the ground water are likely present from the former use of the property as a coal yard. Even though both contaminant concentrations exceed the regulatory limits, Apex believes similar contaminants can be found in many parts of Long Island and the New York City area and is a result of the typical ash backfill previously utilized.

6.0 Recommendations

Apex Environmental, Inc. recommends that the NYSDEC be notified of the exceedences detected during the ground water investigation. All data acquired during the investigation indicates the source of contamination is emanating from an upgradient source, the Westbury Valet Dry Cleaners.



SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

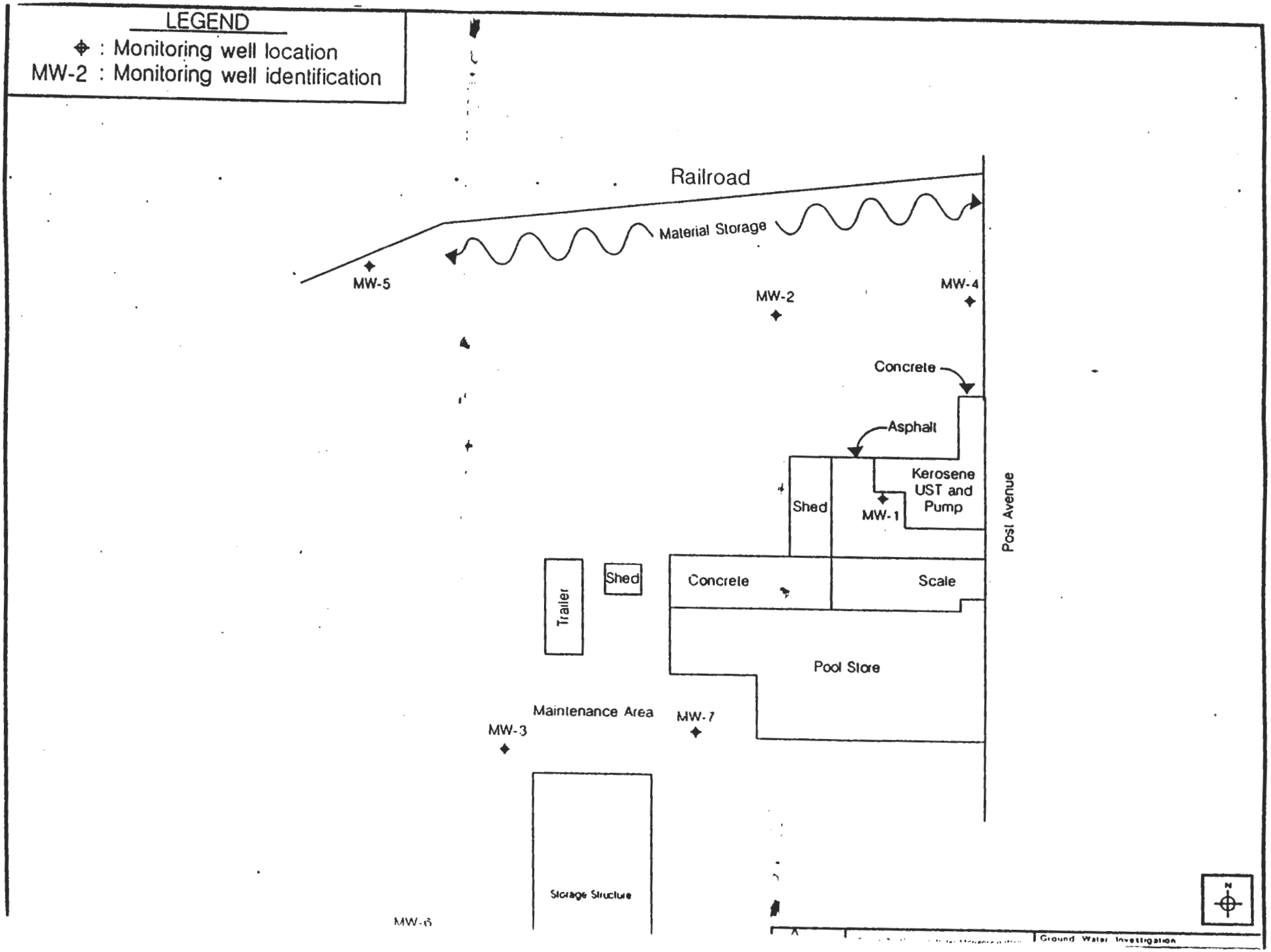
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 7.3 FEET

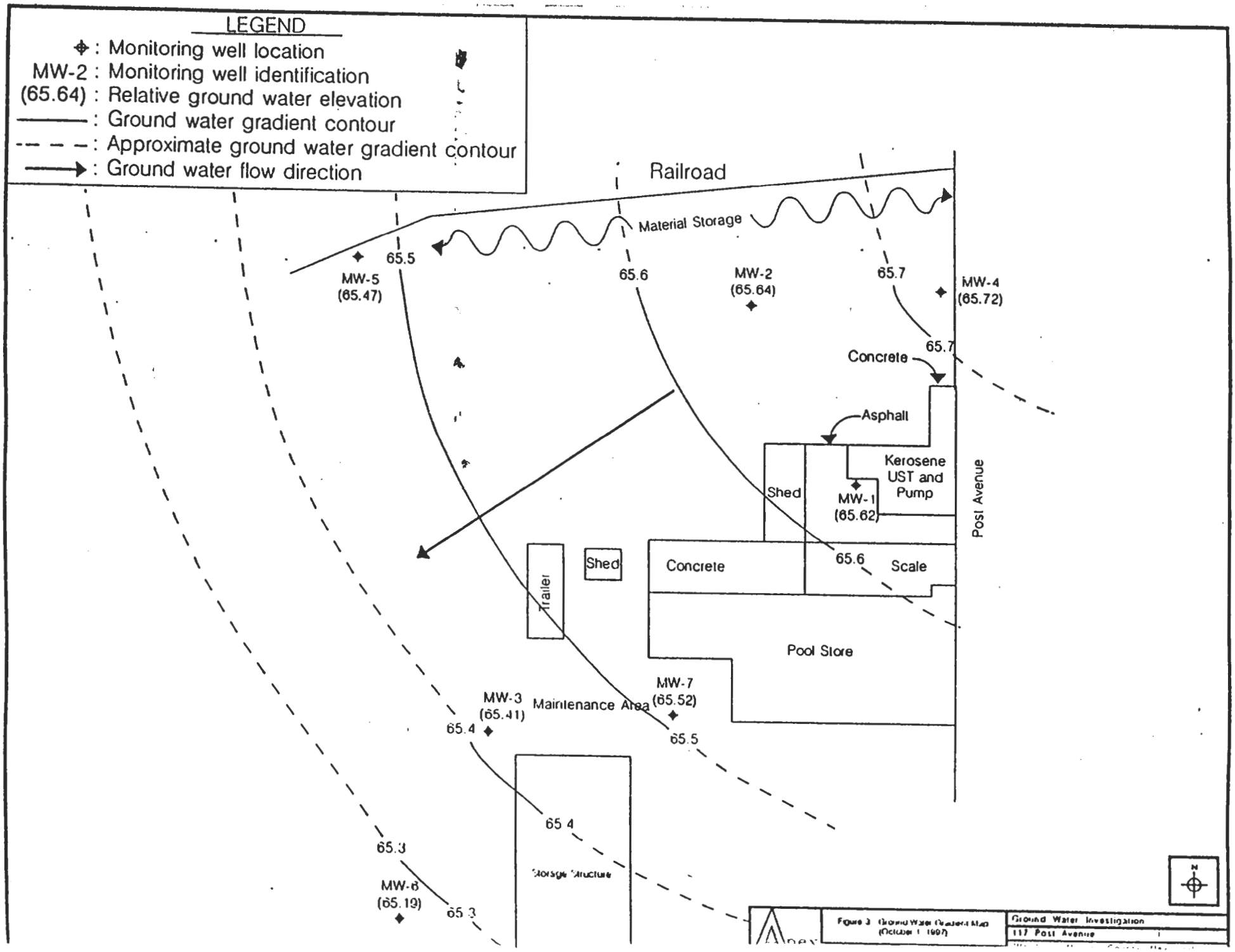
N

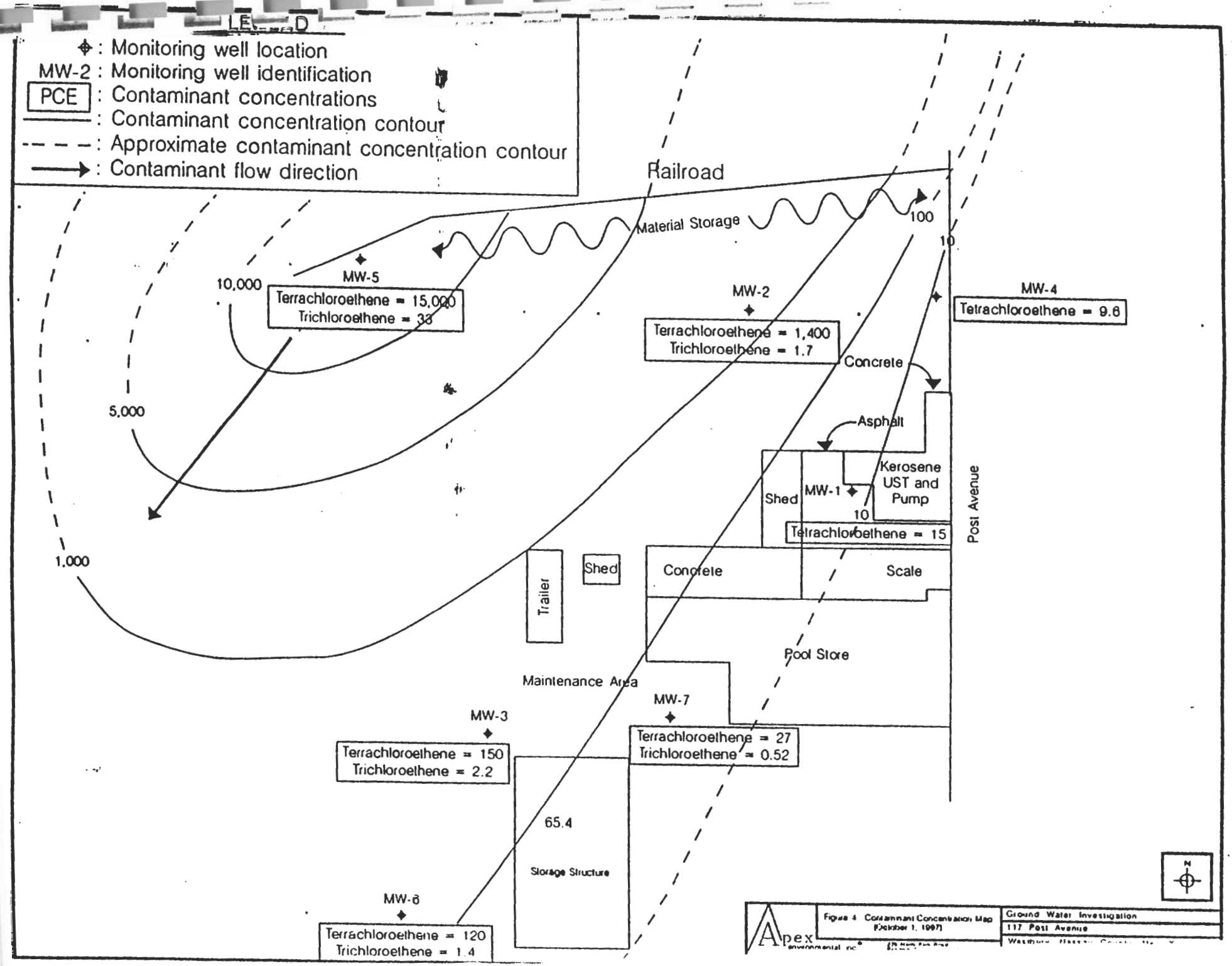
Figure 1 Site Location Map
117 Post Avenue
Westbury, NY 11590

Apex environmental, inc
220 North Park Road
Reading, Pennsylvania 19610
Telephone (610) 371-8400
Facsimile (610) 371-9009

Source: Hicksville, NY and Freeport, NY
7.5 Minute Topographic Quadrangles
Both photorevised 1979


LEGEND
: Monitoring well location
MW-2 : Monitoring well identification
Railroad
Material Storage
MW-5
MW-2
MW-4
Concrete
Asphalt
Kerosene UST and Pump
Shed
MW-1
Post Avenue
Trailer
Shed
Concrete
Scale
Pool Store
Maintenance Area
MW-7
MW-3
Storage Structure
MW-6
N
Ground Water Investigation


LEGEND
⌖ : Monitoring well location
MW-2 : Monitoring well identification
(65.64) : Relative ground water elevation
——— : Ground water gradient contour
- - - : Approximate ground water gradient contour
→ : Ground water flow direction
Railroad
Material Storage
MW-5
(65.47)
65.5
65.6
MW-2
(65.64)
65.7
MW-4
(65.72)
65.7
Concrete
Asphalt
Kerosene
UST and
Pump
Shed
MW-1
(65.62)
Post Avenue
Trailer
Shed
Concrete
65.6
Scale
Pool Store
MW-7
(65.52)
MW-3
(65.41)
Maintenance Area
65.4
65.5
65.4
65.3
MW-6
(65.19)
65.3
Storage Structure
N
Figure 3 Ground Water Gradient Map
(October 1 1997)
Ground Water Investigation
117 Post Avenue


LEGEND
: Monitoring well location
MW-2 : Monitoring well identification
PCE : Contaminant concentrations
: Contaminant concentration contour
: Approximate contaminant concentration contour
: Contaminant flow direction
Railroad
Material Storage
100
10
MW-5
Terrachloroethene = 15,000
Trichloroethene = 33
10,000
MW-2
Terrachloroethene = 1,400
Trichloroethene = 1.7
MW-4
Tetrachloroethene = 9.6
Concrete
5,000
Asphalt
Kerosene UST and Pump
Shed
MW-1
10
Tetrachloroethene = 15
Post Avenue
1,000
Trailer
Shed
Concrete
Scale
Pool Store
Maintenance Area
MW-3
Terrachloroethene = 150
Trichloroethene = 2.2
MW-7
Terrachloroethene = 27
Trichloroethene = 0.52
65.4
Storage Structure
MW-6
Terrachloroethene = 120
Trichloroethene = 1.4
N
Apex environmental inc.
Figure 4 Contaminant Concentration Map (October 1, 1997)
Ground Water Investigation
117 Post Avenue

APPENDIX A

GROUND WATER MONITORING WELL LOGS

APEX™
environmental, inc.

220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue
Location : Westbury, NY
Date : September 25, 1997
Project Manager : James F. Mattern

Job No. : 9932.009

Well ID: MW1

Start Date : July 31, 1997
Complete Date : July 31, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

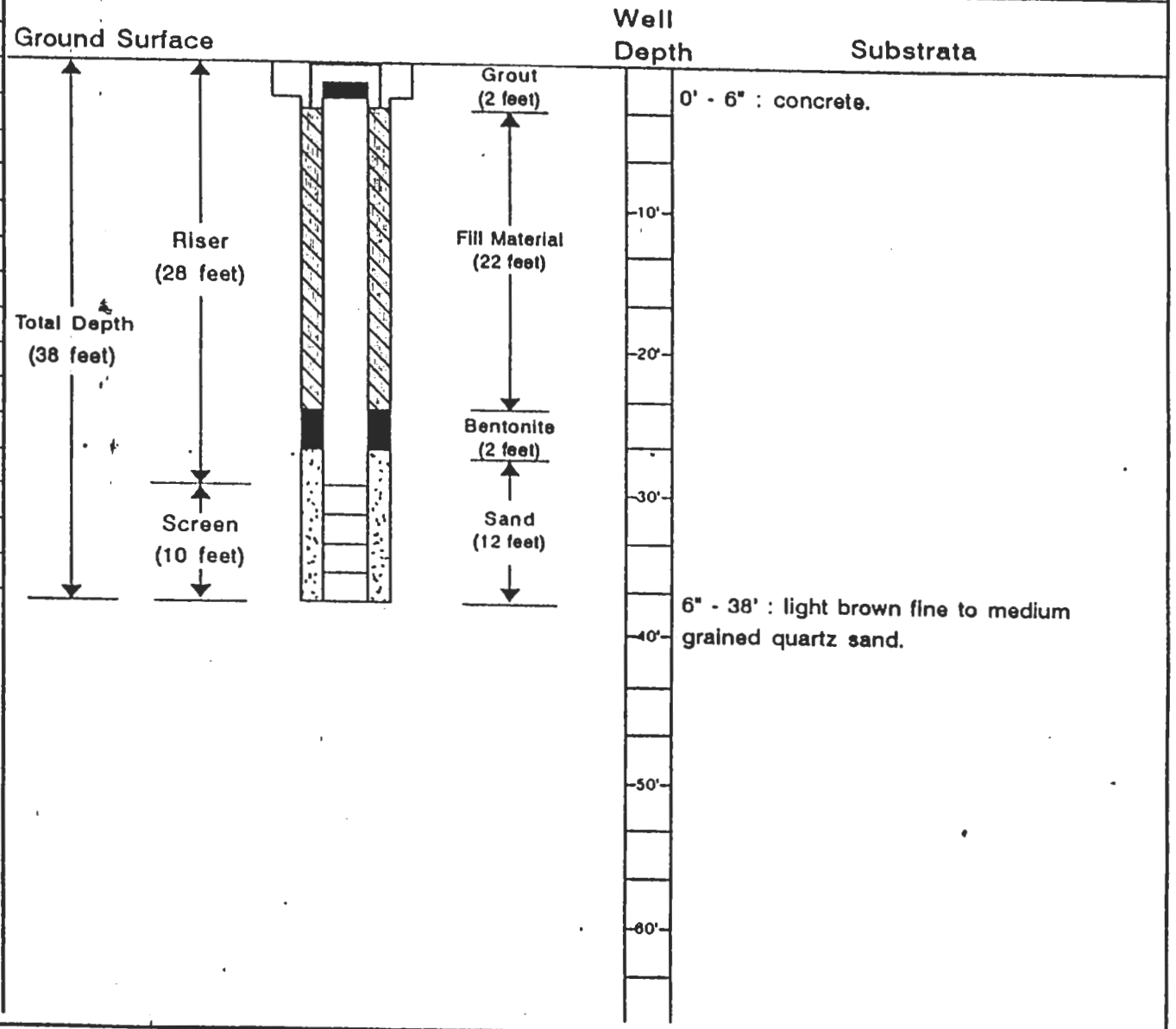
Drilling Method: Auger Relative
Relative Elevation of Well : 92.79

Elevation Measured From: Top of Casing
Depth to Water : 29.45

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Monitoring Well MW-1 Construction Diagram

APEX™
environmental, inc.

220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue
Location : Westbury, NY
Date : September 25, 1997
Project Manager : James F. Mattern

Job No. : 9952.008

Well ID: MW2

Start Date : July 31, 1997
Complete Date : July 31, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

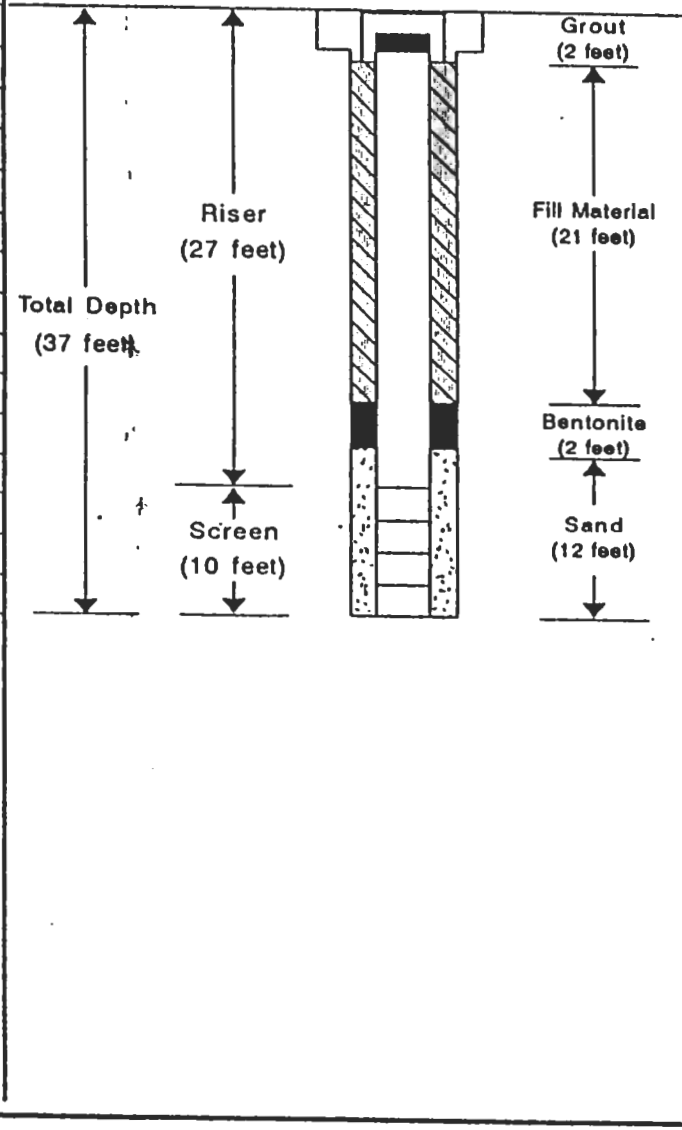
Drilling Method: Auger Relative
Relative Elevation of Well : 93.63

Elevation Measured From: Top of Casing
Depth to Water : 29.91

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Substrata

0' - 6" : fill material.

6" - 37' : light brown fine to medium grained quartz sand.

Monitoring Well MW-2 Construction Diagram

APEX™
environmental, inc.

220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-6400

Project : 117 Post Avenue
Location : Westbury, NY
Date : September 25, 1997
Project Manager : James F. Mattern

Job No. : 9932.009
Well ID: MW3

Start Date : July 31, 1997
Complete Date : July 31, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

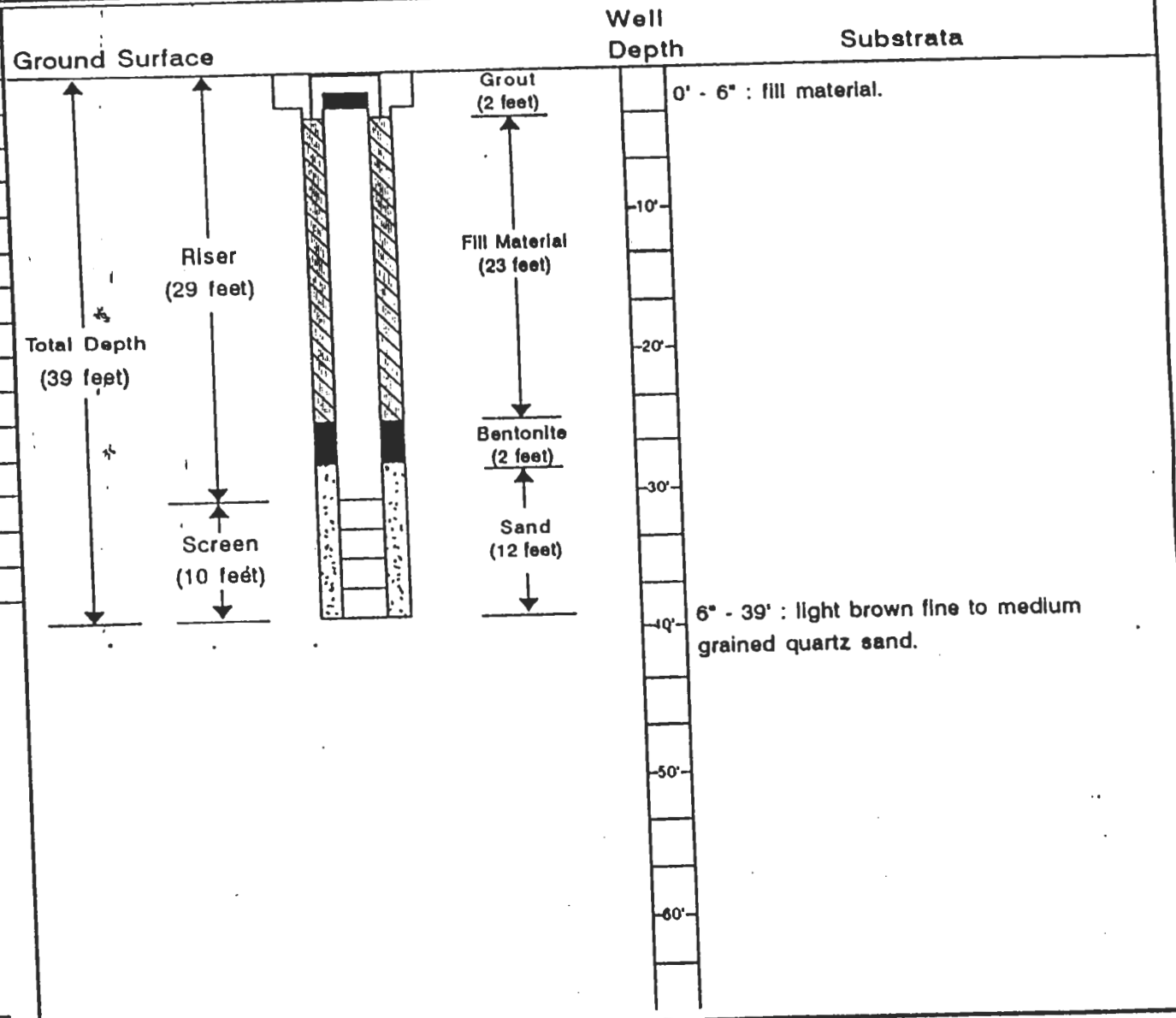
Drilling Method: Auger Relative
Relative Elevation of Well : 94.00

Elevation Measured From: Top of Casing
Depth to Water : 30.52

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Monitoring Well MW-3 Construction Diagram

APEX™
environmental, inc.
220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue
Location : Westbury, NY
Date : October 14, 1997
Project Manager : James F. Mattern

Job No. : 9952.001
Well ID: MW4

Start Date : September 22, 1997
Complete Date : September 22, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

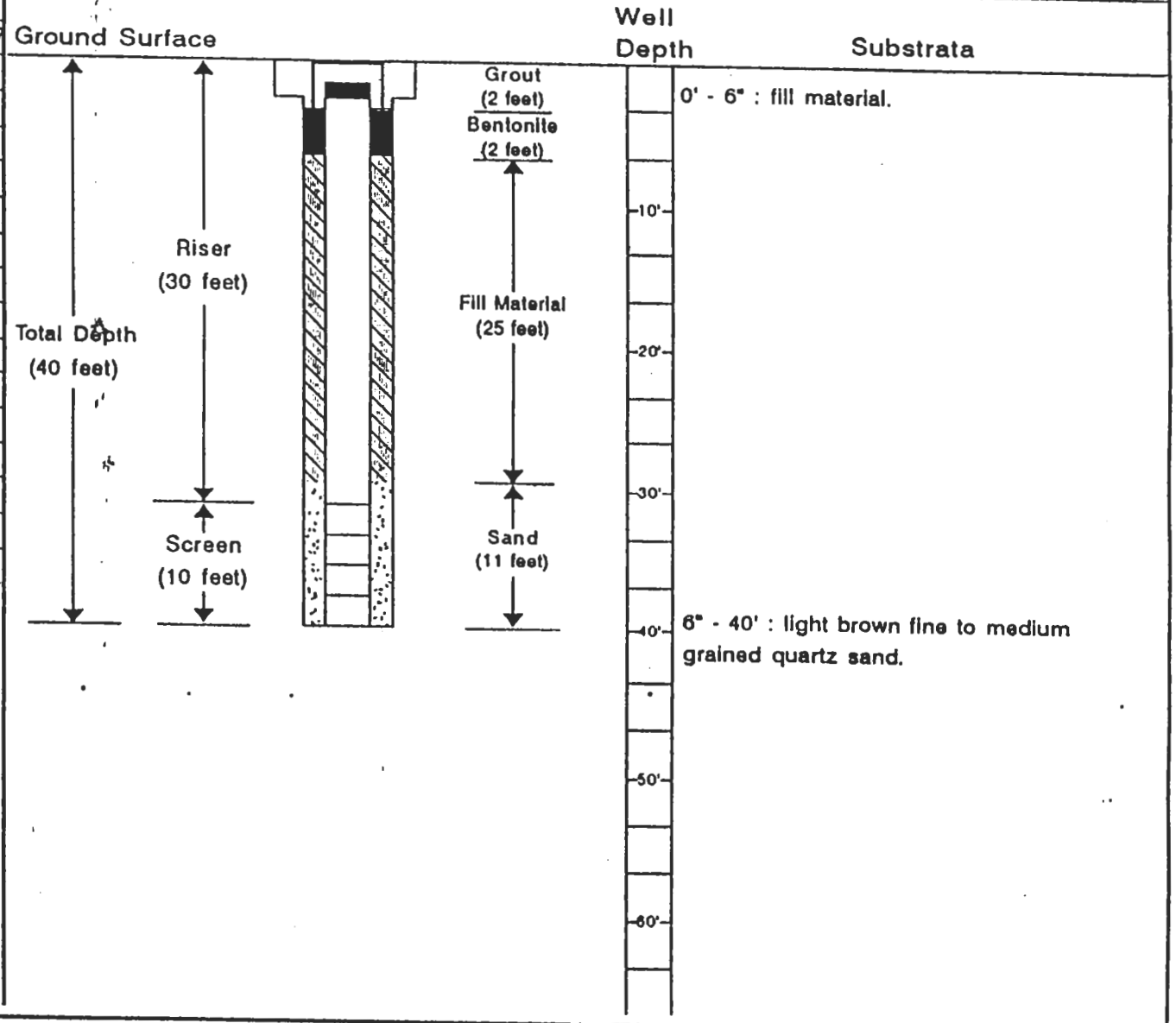
Drilling Method: Auger Relative
Relative Elevation of Well : 95.80

Elevation Measured From: Top of Casing
Depth to Water : 30.08

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Monitoring Well MW-4 Construction Diagram

APEX™
environmental, inc.
220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue	Job No. : 9952.001
Location : Westbury, NY	Well ID: MW5
Date : October 14, 1997	
Project Manager : James F. Mattern	

Start Date : September 22, 1997
Complete Date : September 22, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

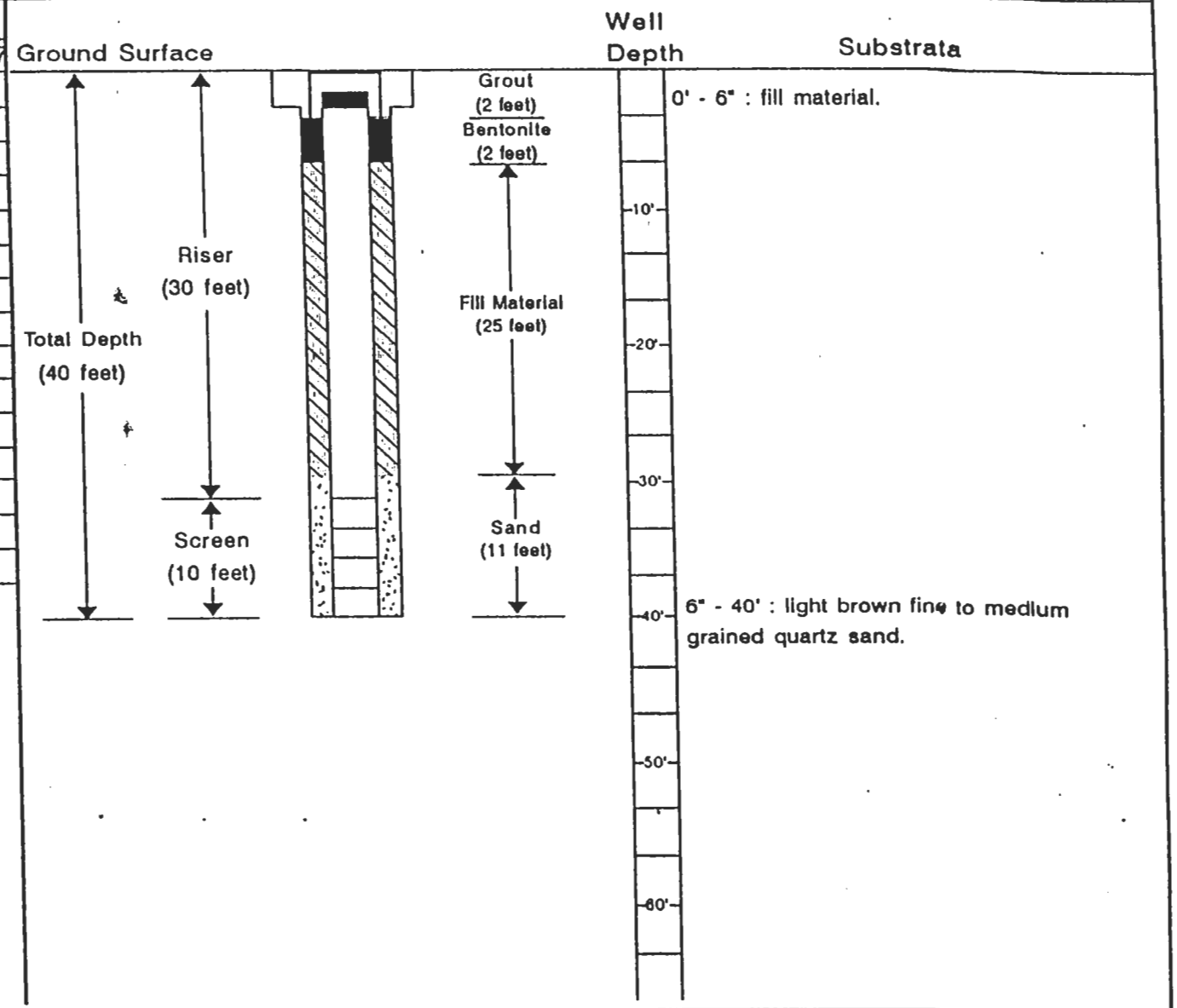
Drilling Method: Auger Relative
Relative Elevation of Well : 97.04

Elevation Measured From: Top of Casing
Depth to Water : 31.57

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Monitoring Well MW-5 Construction Diagram

APEX™
environmental, inc.
220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue
Location : Westbury, NY
Date : October 14, 1997
Project Manager : James F. Mattern

Job No. : 9952.001
Well ID: MW6

Start Date : September 23, 1997
Complete Date : September 23, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

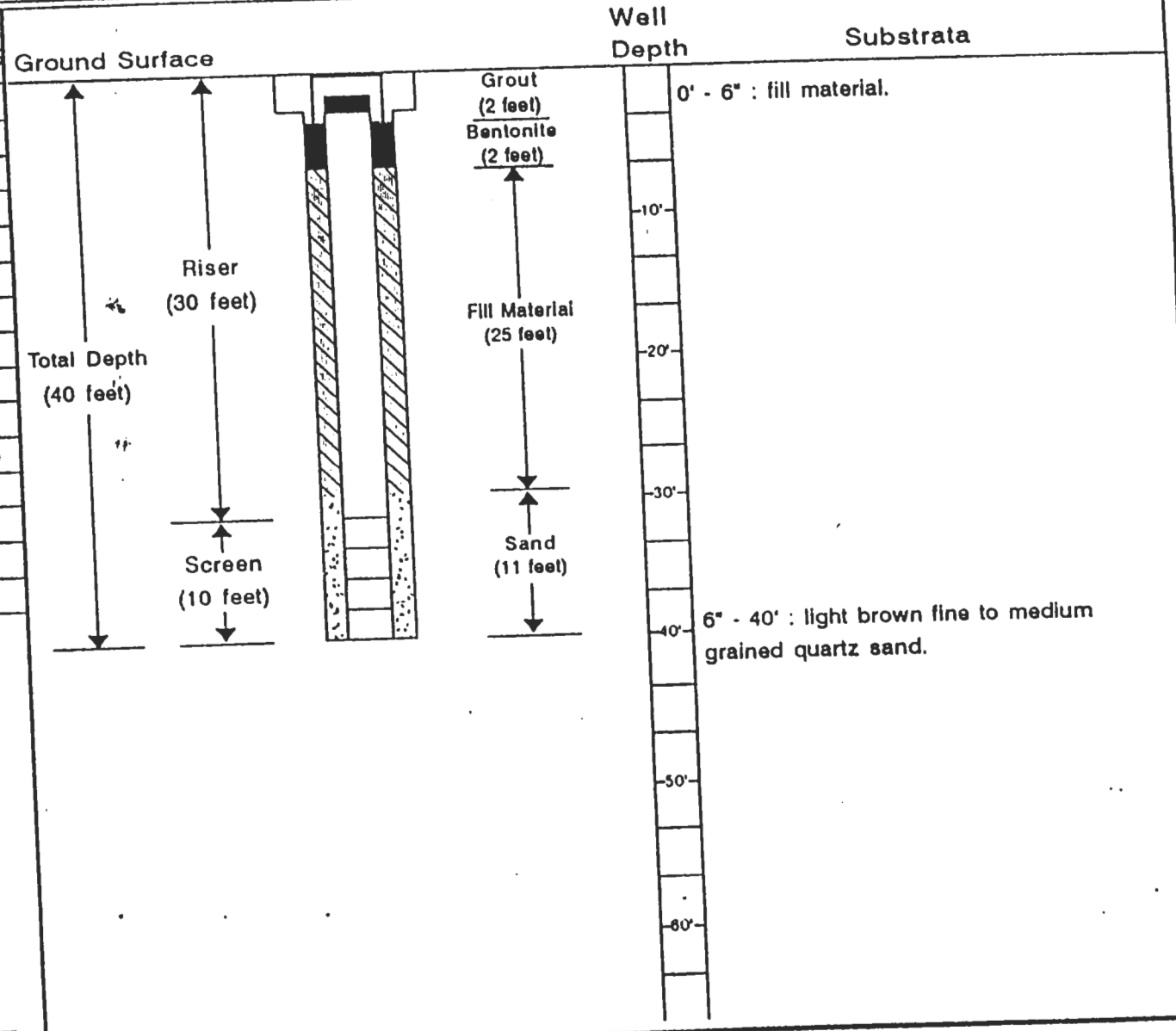
Drilling Method: Auger Relative
Relative Elevation of Well : 97.35

Elevation Measured From: Top of Casing
Depth to Water : 32.16

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



MW-6 Construction Diagram

APEX™
environmental, inc.
220 NORTH PARK ROAD
READING, PENNSYLVANIA 19610
TELEPHONE : (610) 371-8400

Project : 117 Post Avenue
Location : Westbury, NY
Date : October 14, 1997
Project Manager : James F. Mattern

Job No. : 9952.001
Well ID: MW7

Start Date : September 23, 1997
Complete Date : September 23, 1997
Well Cap : Expandable Locking
End Cap : Friction
Security Box : Flush Mount

Hole Diameter : 8 inches
Casing Diameter : 4 inches
Drilling Company : Tri-State Drilling Technolgies, Inc.

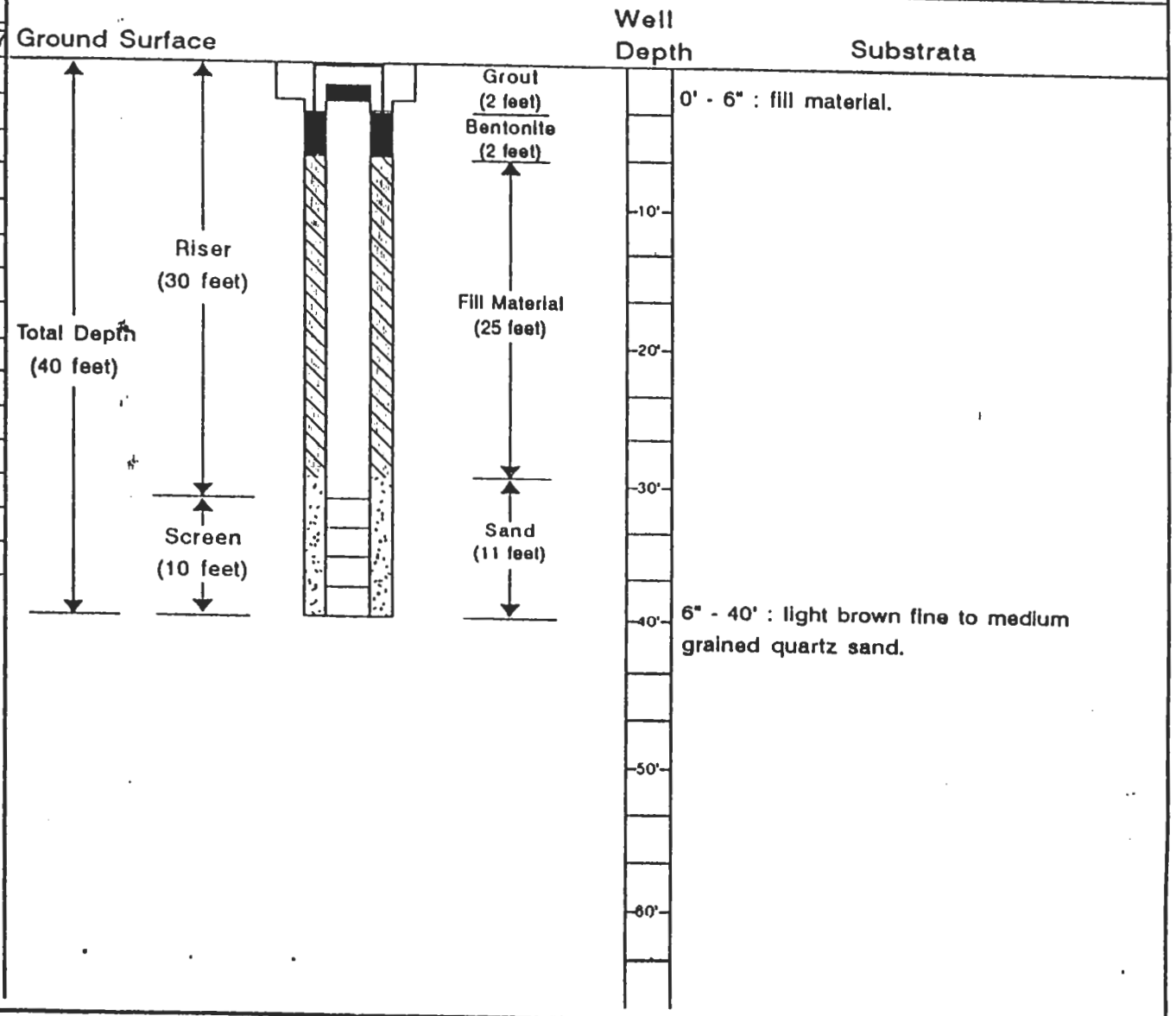
Drilling Method: Auger Relative
Relative Elevation of Well : 95.79

Elevation Measured From: Top of Casing
Depth to Water : 30.27

COMMENTS :

No petroleum odors or signs of contamination observed.

Geologist : Mark E. Zunich



Monitoring Well MW-7 Construction Diagram

APPENDIX B
LABORATORY ANALYTICAL DATA SHEETS AND
CORRESPONDING CHAIN-OF-CUSTODY (August 1997)

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-99

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 199
220 North Park Road	Sample Descript:	Water Post-MW-1-1001	Received:	Oct 1, 199
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 199
Attention: Jim Mattern	Lab Number:	710-0083	Reported:	Oct 7, 199

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	N.D.
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 19
220 North Park Road	Sample Descript:	Water Post-MW-1-1001	Received:	Oct 1, 19
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 19
Attention: Jim Mattern	Lab Number:	710-0083	Reported:	Oct 7, 19

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	15.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

M Slater for

Crystal Pollock
Laboratory Director

GLA LABORATORIES

1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-99

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 199
220 North Park Road	Sample Descript:	Water Post-MW-2-1001	Received:	Oct 1, 199
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 199
Attention: Jim Mattern	Lab Number:	710-0084	Reported:	Oct 7, 199

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	0.94
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-993

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-2-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0084	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	1,400.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	1.7
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

M. Slater for/

Crystal Pollock
Laboratory Director

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-993

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-3-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0085	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	0.89
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-3-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0085	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	150.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	2.2
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

Crystal Pollock
Laboratory Director

7100083.APE <6>

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-4-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0086	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	N.D.
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-993

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-4-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0086	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	9.6
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

Crystal Pollock
Laboratory Director

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 19
220 North Park Road	Sample Descript:	Water Post-MW-5-1001	Received:	Oct 1, 19
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 19
Attention: Jim Mattern	Lab Number:	710-0087	Reported:	Oct 7, 19

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	N.D.
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 : (610) 337-9992 FAX (610) 337-993

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-5-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0087	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	15,000.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	33.0
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

Crystal Pollock
Laboratory Director

GLA LABORATORIES

1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 199
220 North Park Road	Sample Descript:	Water Post-MW-6-1001	Received:	Oct 1, 199
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 199
Attention: Jim Mattern	Lab Number:	710-0088	Reported:	Oct 7, 199

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1 4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	N.D.
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-6-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0088	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	120.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	1.4
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

Crystal Pollock
Laboratory Director

7100083.APE <12>

GLA LABORATORIES

1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-993

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-7-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0089	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.50	N.D.
Bromobenzene	0.50	N.D.
Bromochloromethane	0.50	N.D.
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	0.50	N.D.
n-Butylbenzene	0.50	N.D.
sec-Butylbenzene	0.50	N.D.
tert-Butylbenzene	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
2-Chlorotoluene	0.50	N.D.
4-Chlorotoluene	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	0.50	N.D.
Dibromomethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Dichlorodifluoromethane	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
1,3-Dichloropropane	0.50	N.D.
2,2-Dichloropropane	0.50	N.D.
1,1-Dichloropropene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	0.50	N.D.
p-Isopropyltoluene	0.50	N.D.
Methylene chloride	0.50	N.D.

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

Apex Environmental Inc.	Client Project ID:	Post Ave.	Sampled:	Oct 1, 1997
220 North Park Road	Sample Descript:	Water Post-MW-7-1001	Received:	Oct 1, 1997
Reading, PA 19610	Analysis Method:	5030/8021	Analyzed:	Oct 4, 1997
Attention: Jim Mattern	Lab Number:	710-0089	Reported:	Oct 7, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Detection Limit µg/L	Sample Results µg/L
Naphthalene	1.0	N.D.
n-Propylbenzene	0.50	N.D.
Sytrene	0.50	N.D.
1,1,1,2-Tetrachloroethane	0.50	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	27.0
Toluene	0.50	N.D.
1,2,3-Trichlorobenzene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	0.52
Trichlorofluoromethane	0.50	N.D.
1,2,3-Trichloropropane	0.50	N.D.
1,2,4-Trimethylbenzene	0.50	N.D.
1,3,5-Trimethylbenzene	0.50	N.D.
Vinyl chloride	0.50	N.D.
Total Xylenes	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GLA LABORATORIES

Crystal Pollock
Laboratory Director

7100083.APE <14>

GLA LABORATORIES

CHAIN OF CUSTODY REPORT

1008 W. NINTH AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406
(610) 337-9992 FAX (610) 337-9939

Client: Apex Environmental, Inc.
Address: 220 N. Park Rd.
Reading, PA 19610
Report to: Jim Mattern
Phone #: (610)371-8400
Fax #: (610)371-9009
Project: Post Ave.
Sampler: Mark E. Zmuda
PO/Quote #: 9952.001

Bill To:
Address:
State & Program: NY
Phone #: ( )
Fax #: ( )

TAT: (5 DAY) 4 DAY 3 DAY 2 DAY 1 DAY < 24 HRS.
DATE RESULTS NEEDED: 10/8/97
TEMPERATURE UPON RECEIPT:
AIR BILL NO.

FIELD ID, LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	PRESERVATIVES	NO. CONTAINERS	TYPE CONTAINERS	TCL (VOA) (Volatiles)	SAMPLE CONTROL: CRACKED/BROKEN	SAMPLE CONTROL: IMPROPERLY SEALED	SAMPLE CONTROL: GOOD CONDITION	LABORATORY ID NUMBER
Post-MW1-1001	10/1/97	1300	W	ICE HCl	3	G	X				7100083
Post-MW2-1001		1230					X				7100084
Post-MW3-1001		1400					X				7100085
Post-MW4-1001		1245					X				7100086
Post-MW5-1001		1315					X				7100087
Post-MW6-1001		1330					X				7100088
Post-MW7-1001		1345					X				7100089

RELINQUISHED	RECEIVED	RELINQUISHED	RECEIVED
10/1/97 1846 Mark E Zmuda	10/1/97 1846		
RELINQUISHED	RECEIVED	RELINQUISHED	RECEIVED

COMMENTS: Please Fax results

Appendix 2

Laboratory Data Sheets

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.01 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Water sample, MW#1

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<2
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<1
Trichlorofluomethane	ug/L	<2
1,1 Dichloroethene	ug/L	<1
1,1 Dichloroethane	ug/L	<1
1,2 Dichloroethene	ug/L	2
Chloroform	ug/L	<1
1,2 Dichloroethane	ug/L	<1
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
1,2 Dichloropropane	ug/L	<1
t-1,3Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	3
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c-1,3Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	95

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
1,3 Dichlorobenzene	ug/L	<2
1,2 Dichlorobenzene	ug/L	<2
1,4 Dichlorobenzene	ug/L	<2

cc:

REMARKS:

DIRECTOR

rn= 8379 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.02 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Water sample, MW#2

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<2
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<1
Trichlorofluomethane	ug/L	<2
1,1 Dichloroethene	ug/L	<1
1,1 Dichloroethane	ug/L	<1
1,2 Dichloroethene	ug/L	13
Chloroform	ug/L	<1
1,2 Dichloroethane	ug/L	<1
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
1,2 Dichloropropane	ug/L	<1
t-1,3Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c-1,3Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	690

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
1,3 Dichlorobenzene	ug/L	<2
1,2 Dichlorobenzene	ug/L	<2
1,4 Dichlorobenzene	ug/L	<2

cc:

REMARKS:

DIRECTOR

rn= 8380 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.03 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Water sample, MW#3

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<2
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<1
Trichlorofluomethane	ug/L	<2
1,1 Dichloroethene	ug/L	<1
1,1 Dichloroethane	ug/L	<1
1,2 Dichloroethene	ug/L	98
Chloroform	ug/L	<1
1,2 Dichloroethane	ug/L	<1
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
1,2 Dichloropropane	ug/L	<1
t-1,3Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	11
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c-1,3Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	20000

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
1,3 Dichlorobenzene	ug/L	<2
1,2 Dichlorobenzene	ug/L	<2
1,4 Dichlorobenzene	ug/L	<2

cc:

REMARKS:

DIRECTOR

rn= 8381 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.05 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (10-11)

ANALYTICAL PARAMETERS		
Vinyl Chloride	ug/Kg	<1000
Trichlorofluomethane	ug/Kg	<1000
1,1 Dichloroethene	ug/Kg	<1000
Methylene Chloride	ug/Kg	<1000
t-1,2-Dichloroethene	ug/Kg	<1000
1,1 Dichloroethane	ug/Kg	<1000
2,2-Dichloropropane	ug/Kg	<1000
c-1,2-Dichloroethene	ug/Kg	<1000
Bromochloromethane	ug/Kg	<1000
Chloroform	ug/Kg	<1000
111 Trichloroethane	ug/Kg	<1000
1,1-Dichloropropene	ug/Kg	<1000
Carbon Tetrachloride	ug/Kg	<1000
Benzene	ug/Kg	<1000
1,2 Dichloroethane	ug/Kg	<1000
Trichloroethylene	ug/Kg	<1000
1,2 Dichloropropane	ug/Kg	<1000
Bromodichloromethane	ug/Kg	<1000
Dibromomethane	ug/Kg	<1000
Toluene	ug/Kg	<1000
112 Trichloroethane	ug/Kg	<1000
Tetrachloroethene	ug/Kg	270000
1,3-Dichloropropane	ug/Kg	<1000
Chlorodibromomethane	ug/Kg	<1000
1,2 Dibromoethane	ug/Kg	<1000

ANALYTICAL PARAMETERS		
1112Tetrachloroethan	ug/Kg	<1000
Chlorobenzene	ug/Kg	<1000
Ethyl Benzene	ug/Kg	<1000

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 1 of 2.
Elevated detection limit due to interference in sample.

DIRECTOR Thomas R. [illegible]

rn= 8383 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.05 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (10-11)

ANALYTICAL PARAMETERS		
m + p Xylene	ug/Kg	<2000
o Xylene	ug/Kg	<1000
Styrene	ug/Kg	<1000
Bromoform	ug/Kg	<1000
Isopropylbenzene	ug/Kg	<1000
1122Tetrachloroethan	ug/Kg	<1000
Bromobenzene	ug/Kg	<1000
123-Trichloropropane	ug/Kg	<1000
n-Propylbenzene	ug/Kg	<1000
2-Chlorotoluene	ug/Kg	<1000
135-Trimethylbenzene	ug/Kg	<1000
4-Chlorotoluene	ug/Kg	<1000
tert-Butylbenzene	ug/Kg	<1000
124-Trimethylbenzene	ug/Kg	<1000
sec-Butylbenzene	ug/Kg	<1000
p-Isopropyltoluene	ug/Kg	<1000
1,2 Dichlorobenzene	ug/Kg	<1000
1,3 Dichlorobenzene	ug/Kg	<1000
1,4 Dichlorobenzene	ug/Kg	<1000
DBCP	ug/Kg	<1000
124-Trichlorobenzene	ug/Kg	<1000
Hexachlorobutadiene	ug/Kg	<1000
Naphthalene	ug/Kg	<1000
123-Trichlorobenzene	ug/Kg	<1000
c-1,3Dichloropropene	ug/Kg	<1000

ANALYTICAL PARAMETERS		
t-1,3Dichloropropene	ug/Kg	<1000
Acetone	ug/Kg	<10000
% Solids		98

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 2 of 2.
Elevated detection limit due to interference in sample.

DIRECTOR

rn= 8384 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.07 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (30-32)

ANALYTICAL PARAMETERS		
Vinyl Chloride	ug/Kg	<1
Trichlorofluomethane	ug/Kg	<1
1,1 Dichloroethene	ug/Kg	<1
Methylene Chloride	ug/Kg	<1
t-1,2-Dichloroethene	ug/Kg	<1
1,1 Dichloroethane	ug/Kg	<1
2,2-Dichloropropane	ug/Kg	<1
c-1,2-Dichloroethene	ug/Kg	<1
Bromochloromethane	ug/Kg	<1
Chloroform	ug/Kg	<1
111 Trichloroethane	ug/Kg	<1
1,1-Dichloropropene	ug/Kg	<1
Carbon Tetrachloride	ug/Kg	<1
Benzene	ug/Kg	<1
1,2 Dichloroethane	ug/Kg	<1
Trichloroethylene	ug/Kg	<1
1,2 Dichloropropane	ug/Kg	<1
Bromodichloromethane	ug/Kg	<1
Dibromomethane	ug/Kg	<1
Toluene	ug/Kg	<1
112 Trichloroethane	ug/Kg	<1
Tetrachloroethene	ug/Kg	17
1,3-Dichloropropane	ug/Kg	<1
Chlorodibromomethane	ug/Kg	<1
1,2 Dibromoethane	ug/Kg	<1

ANALYTICAL PARAMETERS		
1112Tetrachloroethan	ug/Kg	<1
Chlorobenzene	ug/Kg	<1
Ethyl Benzene	ug/Kg	<1

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 1 of 2.

DIRECTOR

rn= 8387 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.06 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (20-22)

ANALYTICAL PARAMETERS		
Vinyl Chloride	ug/Kg	<1
Trichlorofluomethane	ug/Kg	<1
1,1 Dichloroethene	ug/Kg	<1
Methylene Chloride	ug/Kg	<1
t-1,2-Dichloroethene	ug/Kg	<1
1,1 Dichloroethane	ug/Kg	<1
2,2-Dichloropropane	ug/Kg	<1
c-1,2-Dichloroethene	ug/Kg	<1
Bromochloromethane	ug/Kg	<1
Chloroform	ug/Kg	<1
111 Trichloroethane	ug/Kg	<1
1,1-Dichloropropene	ug/Kg	<1
Carbon Tetrachloride	ug/Kg	<1
Benzene	ug/Kg	<1
1,2 Dichloroethane	ug/Kg	<1
Trichloroethylene	ug/Kg	<1
1,2 Dichloropropane	ug/Kg	<1
Bromodichloromethane	ug/Kg	<1
Dibromomethane	ug/Kg	<1
Toluene	ug/Kg	<1
112 Trichloroethane	ug/Kg	<1
Tetrachloroethene	ug/Kg	53
1,3-Dichloropropane	ug/Kg	<1
Chlorodibromomethane	ug/Kg	<1
1,2 Dibromoethane	ug/Kg	<1

ANALYTICAL PARAMETERS		
1112Tetrachloroethan	ug/Kg	<1
Chlorobenzene	ug/Kg	<1
Ethyl Benzene	ug/Kg	<1

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 1 of 2.

DIRECTOR

rn= 8385 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.06 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (20-22)

ANALYTICAL PARAMETERS		
m + p Xylene	ug/Kg	<2
o Xylene	ug/Kg	<1
Styrene	ug/Kg	<1
Bromoform	ug/Kg	<1
Isopropylbenzene	ug/Kg	<1
1122Tetrachloroethan	ug/Kg	<1
Bromobenzene	ug/Kg	<1
123-Trichloropropane	ug/Kg	<1
n-Propylbenzene	ug/Kg	<1
2-Chlorotoluene	ug/Kg	<1
135-Trimethylbenzene	ug/Kg	<1
4-Chlorotoluene	ug/Kg	<1
tert-Butylbenzene	ug/Kg	<1
124-Trimethylbenzene	ug/Kg	<1
sec-Butylbenzene	ug/Kg	<1
p-Isopropyltoluene	ug/Kg	<1
1,2 Dichlorobenzene	ug/Kg	<1
1,3 Dichlorobenzene	ug/Kg	<1
1,4 Dichlorobenzene	ug/Kg	2
DBCP	ug/Kg	<1
124-Trichlorobenzene	ug/Kg	52
Hexachlorobutadiene	ug/Kg	3
Naphthalene	ug/Kg	1
123-Trichlorobenzene	ug/Kg	<1
c-1,3Dichloropropene	ug/Kg	<1

ANALYTICAL PARAMETERS		
t-1,3Dichloropropene	ug/Kg	<1
Acetone	ug/Kg	<10
% Solids		98

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 2 of 2.

DIRECTOR Thomas K...

rn= 8386 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.07 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (30-32)

ANALYTICAL PARAMETERS		
Vinyl Chloride	ug/Kg	<1
Trichlorofluomethane	ug/Kg	<1
1,1 Dichloroethene	ug/Kg	<1
Methylene Chloride	ug/Kg	<1
t-1,2-Dichloroethene	ug/Kg	<1
1,1 Dichloroethane	ug/Kg	<1
2,2-Dichloropropane	ug/Kg	<1
c-1,2-Dichloroethene	ug/Kg	<1
Bromochloromethane	ug/Kg	<1
Chloroform	ug/Kg	<1
111 Trichloroethane	ug/Kg	<1
1,1-Dichloropropene	ug/Kg	<1
Carbon Tetrachloride	ug/Kg	<1
Benzene	ug/Kg	<1
1,2 Dichloroethane	ug/Kg	<1
Trichloroethylene	ug/Kg	<1
1,2 Dichloropropane	ug/Kg	<1
Bromodichloromethane	ug/Kg	<1
Dibromomethane	ug/Kg	<1
Toluene	ug/Kg	<1
112 Trichloroethane	ug/Kg	<1
Tetrachloroethene	ug/Kg	17
1,3-Dichloropropane	ug/Kg	<1
Chlorodibromomethane	ug/Kg	<1
1,2 Dibromoethane	ug/Kg	<1

ANALYTICAL PARAMETERS		
1112Tetrachloroethan	ug/Kg	<1
Chlorobenzene	ug/Kg	<1
Ethyl Benzene	ug/Kg	<1

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 1 of 2.

DIRECTOR

rn= 8387 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.07 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Soil sample, FD#2 (30-32)

ANALYTICAL PARAMETERS		
m + p Xylene	ug/Kg	<2
o Xylene	ug/Kg	<1
Styrene	ug/Kg	<1
Bromoform	ug/Kg	<1
Isopropylbenzene	ug/Kg	<1
1122Tetrachloroethan	ug/Kg	<1
Bromobenzene	ug/Kg	<1
123-Trichloropropane	ug/Kg	<1
n-Propylbenzene	ug/Kg	<1
2-Chlorotoluene	ug/Kg	<1
135-Trimethylbenzene	ug/Kg	<1
4-Chlorotoluene	ug/Kg	<1
tert-Butylbenzene	ug/Kg	<1
124-Trimethylbenzene	ug/Kg	<1
sec-Butylbenzene	ug/Kg	<1
p-Isopropyltoluene	ug/Kg	<1
1,2 Dichlorobenzene	ug/Kg	<1
1,3 Dichlorobenzene	ug/Kg	<1
1,4 Dichlorobenzene	ug/Kg	<1
DBCP	ug/Kg	<1
124-Trichlorobenzene	ug/Kg	<1
Hexachlorobutadiene	ug/Kg	<1
Naphthalene	ug/Kg	<1
123-Trichlorobenzene	ug/Kg	<1
c-1,3Dichloropropene	ug/Kg	<1

ANALYTICAL PARAMETERS		
t-1,3Dichloropropene	ug/Kg	<1
Acetone	ug/Kg	<10
% Solids		83

cc:

REMARKS: Volatile Organic Compounds by EPA Method 8260.
Page 2 of 2.

DIRECTOR

n= 8388 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.991339.04 04/09/99

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743
ATTN: Dennis Madigan

SOURCE OF SAMPLE: Westbury Dry Cleaners, #96002
COLLECTED BY: Client DATE COL'D:03/31/99 RECEIVED:04/01/99

SAMPLE: Water sample, FD#2 (GW 36-40)

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<2
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<1
Trichlorofluomethane	ug/L	<2
1,1 Dichloroethene	ug/L	<1
1,1 Dichloroethane	ug/L	<1
1,2 Dichloroethene	ug/L	<1
Chloroform	ug/L	<1
1,2 Dichloroethane	ug/L	<1
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
1,2 Dichloropropane	ug/L	<1
t-1,3Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c-1,3Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	62

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
1,3 Dichlorobenzene	ug/L	<2
1,2 Dichlorobenzene	ug/L	<2
1,4 Dichlorobenzene	ug/L	<2

cc:

REMARKS:

DIRECTOR

tn= 8382 NYSDOH ID# 10320

Appendix 3

Nassau County Discharge Letter

THOMAS S. GULOTTA
COUNTY EXECUTIVE

JOHN M. WALTZ, P.E.
COMMISSIONER

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
MINEOLA, NEW YORK 11501-4822

April 2, 1999

Mr. Dennis Madigan
Anson Environmental Ltd.
771 New York Avenue
Huntington, New York 11743

Re: Westbury Cleaners
123 Post Avenue
Westbury, New York

Dear Mr. Madigan:

Your request to discharge approximately 165 gallons of well development water to the public sewer through the building sewer, on-site, has been considered and is hereby approved.

This determination of approval for the proposed and regulated discharge is based on the non-hazardous nature and sewer acceptable quality of the wastewater as indicated through certified laboratory analyses.

Your concern and cooperation are appreciated. If you have any questions with regard to this matter, please call me at 516-571-7352.

Very truly yours,

Maurice J. Osman
Chief Chemist

MJO:sm

c: Richard Cotugno, NCDPW

Appendix 2

Manufacturer's Information Sheets

Measurement Accessories

Blower Connection Key
NPT – American National Standard Taper Pipe Thread (Male)
NPSC – American National Standard Straight Pipe Thread for Coupling (Female)
SO – Slip On (Smooth – No Threads)

Air Flow Meter

FEATURES

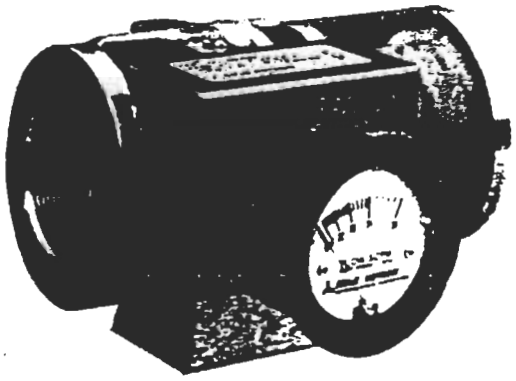
- Direct reading in SCFM
- Low pressure drop (2-4" typical) across the flow meter
- Non-clogging, low impedance air stream
- Light weight aluminum
- No moving parts
- Large easy-to-read dial
- Accurate within 2% at standard conditions
- Good repeatability
- Available in 2", 3" and 4" sizes
- Factory configured for quick installation
- .048" Allen key supplied for gauge adjustment

OPTIONS

- For 4-20 mA outputs and digital readouts see page G-9
- High temperature version (above 140°F)
- Corrosion-resistant version with Chem-Tough™ or in stainless steel
- FDA-approved Food Tough™ surface conversion
- High pressure version (100 PSI)

BENEFITS

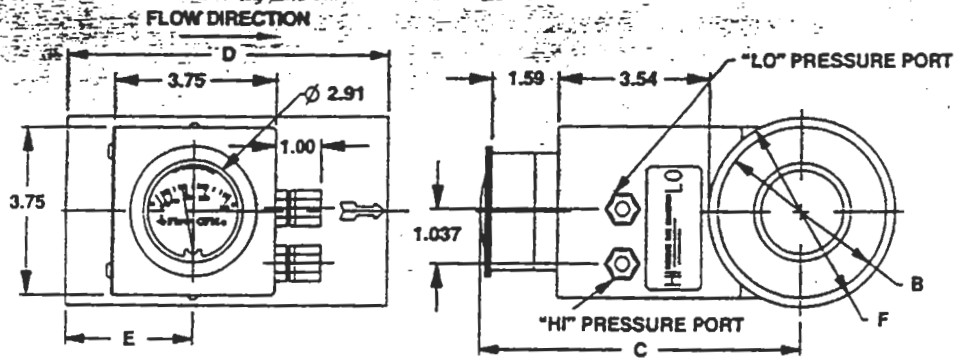
- OPTIMIZE SYSTEM EFFICIENCY
  Measuring the correct air flow can assist you in fine-tuning to your system's optimal efficiency.
- BALANCE MULTI-PIPING SYSTEMS
  When evacuating CFM from more than one pipe, different run lengths or end system impedance can cause one pipe to handle more CFM than the other. With an accurate CFM reading, piping can be balanced by bleeding air in/out or by creating an extra impedance.
- DETECT CHANNELING OR PLUGGING
  For systems in which channeling or plugging can occur, a change in the CFM measured can help indicate the unseen changes in your system.



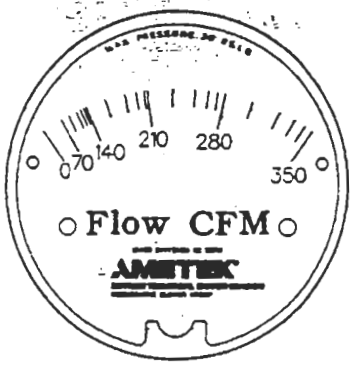
Current Models		Flow Range	B	C	D	E	F	Replaces	
Model	Part #	(SCFM)	Threads	Length	Width			Model	Part #
FM20C030Q	550599	6-30	2" - 11.5 NPSC	7.18"	7.0"	2.0"	3.75"	FM20A030Q	550312
FM20C045Q	550600	9-45						FM20A045Q	550313
FM20C065Q	550601	13-65						FM20A065Q	550314
FM20C125Q	550602	25-125			5.6"			FM20A125Q	550256
FM20C175Q	550603	35-175						FM20A175Q	550255
FM20C225Q	550604	45-225						FM20A225Q	550254
FM30C250Q	550605	50-250	3" - 8 NPSC	7.52"	7.4"	2.5"	4.43"	FM30A250Q	550259
FM30C350Q	550606	70-350						FM30A350Q	550258
FM30C475Q	550607	95-475						FM30A475Q	550257
FM40C450Q	550608	90-450	4" - 8 NPSC	8.00"	7.7"	2.7"	5.43"	FM40A450Q	550262
FM40C600Q	550609	120-600						FM40A600Q	550261

Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 606, S543, 6, 623, S7, S75
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 702, 808, S85, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 823, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 1223, 14, S15, P15 (Inlet Only)

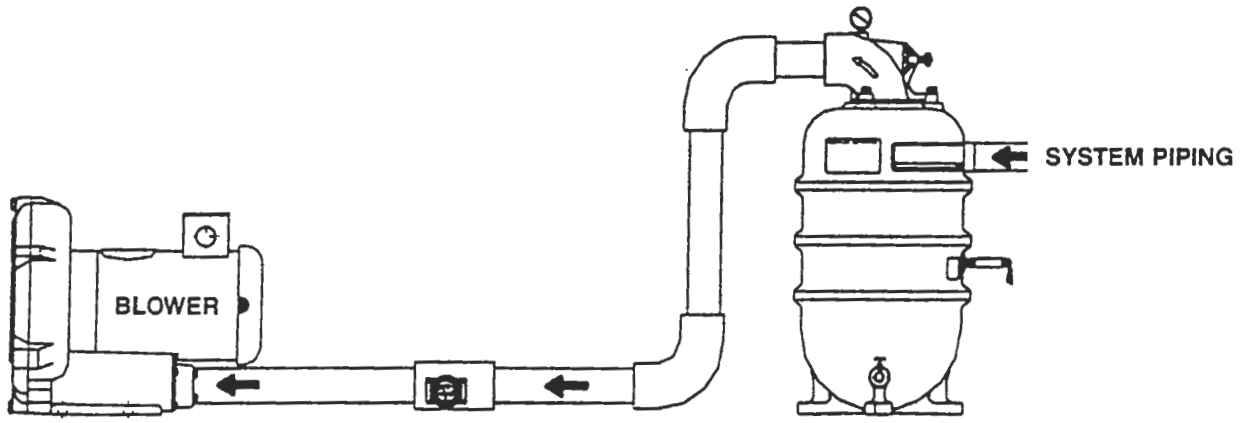
TYPICAL FLOW METER ARRANGEMENT



ANALOG FLOW METER



TYPICAL GAUGE FACE



HIGH TEMPERATURE/PRESSURE CORRECTION

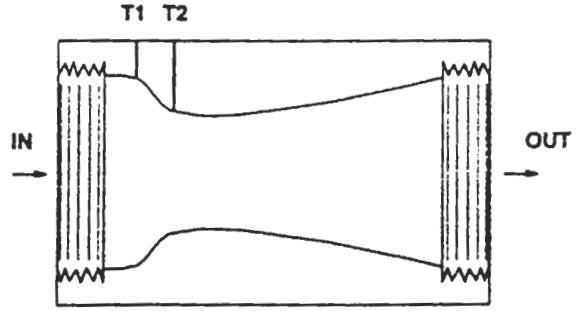
$$SCFM_2 = \frac{SCFM_1}{\sqrt{\left(\frac{14.7}{Pf_2}\right) \times \left(\frac{530}{Tf_2 + 460}\right)}}$$

Pf_2 = Absolute Pressure in PSIA

Tf_2 = Temperature in °F

- Use on inlet to limit need to correct for high pressure or elevated outlet temperature
- Standard model limits = 140°F and 30 PSIG

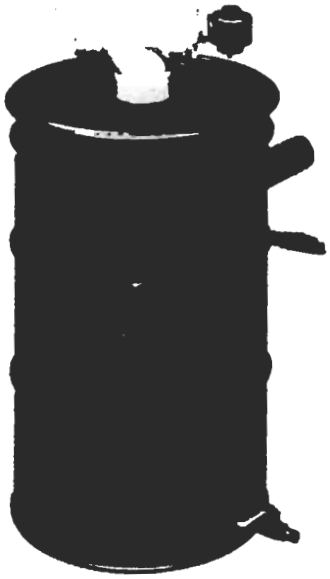
HOW IT WORKS



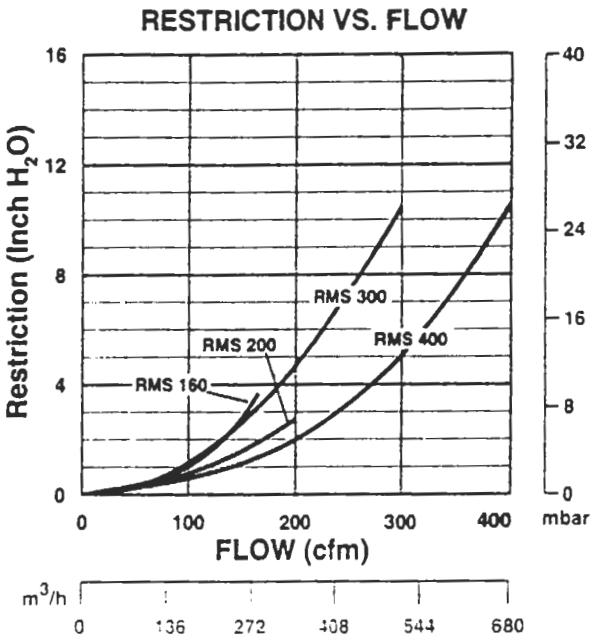
Rotron's flow meter is a venturi style design. After air enters the inlet, the pressure is measured in the T1 tap. The second tap, T2, measures the pressure at the throat. The differential between T1 and T2 registers across a special calibrated CFM gauge to provide accurate readings. The throat is then expanded back to the original size to keep pressure loss to under 2-4 IWG.

LIQUID SE

The separator removes liquids from the gas stream in a soil vapor extraction process, to help protect both blower and vapor treatment system from corrosion and mineral deposit buildup. The separator is located between the extraction wells and the blower. An in-line filter is installed between separator and blower.



Cut away to show ball float. Above model shows optional explosion proof float switch

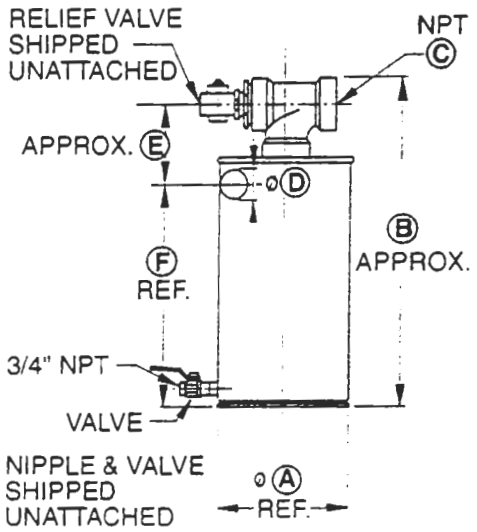


Regenair® Liquid Separator Specifications

Practical Design Engineered to remove and contain moisture ranging from a fine mist to slugs of water from blower inlet air streams, Gast separators incorporate a cyclonic action which results in a very high degree of efficiency.
A floating ball valve which closes when the liquid level becomes too high prevents collected liquid from overflowing back into the air stream. When the float valve closes an integral vacuum relief valve opens, admitting air to cool the blower and prevent overheating.

Rugged Construction Gast separator drums are made from ribbed heavy gauge cold-rolled steel, with heavy steel inlet, drain and float switch ports welded to the drum wall. Drum interiors are epoxy coated to resist abrasion, corrosion and chemicals, while the drum exterior is coated with durable urethane. For ease of connection, the outlet port is female pipe threaded. The heavy-duty 304 stainless steel ball float resists chemicals.

Included is a pilot operated precision relief valve capable of functioning over a wide duty range. This vacuum relief valve is designed and built to proven reliability and durability standards. Moving parts are nickelplated for corrosion resistance and smooth operation.



Part No.	Liq. Cap. (gal.)	A(dia.)	Dim. B	C(NPT)	D(dia.)	Dim. E	Dim. F
RMS160	10	14.8"	37.5"	2"	2"	7.5"	26.6"
RMS200	19	19.7"	35"	2"	2"	7.5"	26.6"
RMS300	19	19.7"	35"	2.5"	2.5"	7.5"	26.6"
RMS400	40	24"	44"	3"	3"	9.7"	29"

Filtration Accessories

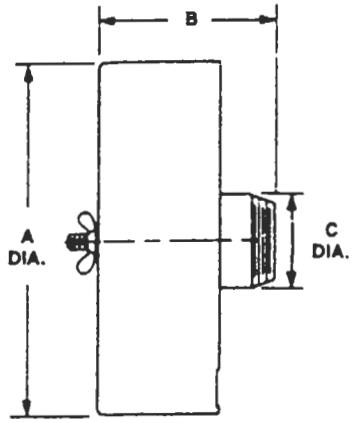
Blower Connection Key
NPT – American National Standard Taper Pipe Thread (Male)
NPSC – American National Standard Straight Pipe Thread for Coupling (Female)
SO – Slip On (Smooth – No Threads)

Inlet Filter (Single Connection)

Inlet Filters protect the blower and the air distribution system from dust, and other airborne particles and contaminants. Normally used in pressure systems.

SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available



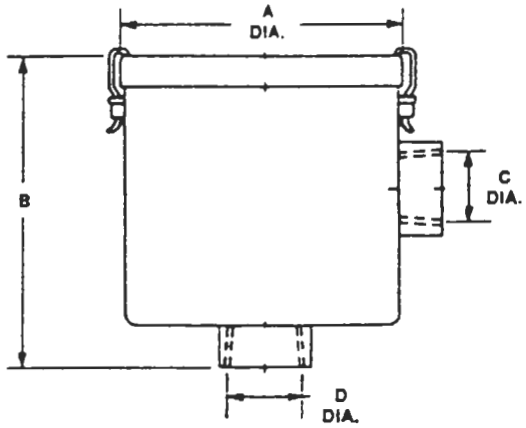
Standard Media Part Number	Z Media Filter Part Number	Reference Blower Model	Connection Inlet	Dimensions (Inches) A	B	C	Filter Element
477411		A	2.00 SO	4.56	7.00	2.00	271078
516466	517865	B	1.00 NPT	6.00	6.50	1.00	515132
515122	517866	C,D	1.50 NPT	6.00	6.50	1.50	515132
515123	517867	E	2.00 NPT	7.75	7.25	2.00	515133
515124	517868	E	2.00 NPT	10.00	12.25	2.00	515134
515125	517869	F	2.50 NPT	10.00	12.50	2.50	515134
515145	517870	G	3.00 NPT	10.00	13.00	3.00	515134
515151	517871	H	4.00 NPT	10.00	14.00	4.00	515135
516511	517872	H	6.00 NPT	16.00	15.00	6.00	516515

Inline Filter (Dual Connection)

Inline Filters protect the blower from harmful dust and other particles that may be drawn into the blower through the air distribution system. Normally used in vacuum systems.

SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available



Standard Media Part Number	Z Media Filter Part Number	Reference Blower Model	Connection Inlet	Connection Outlet	Dimensions (Inches) A	B	C	D	Filter Element
271200		A	1.75 SO	2.00 SO	5.25	8.31	2.00	1.75	271078
516461	517886	B	1.00 NPSC-F	1.00 NPSC-F	7.25	6.50	1.00	1.00	516434
515254	517887	C,D	1.50 NPSC-F	1.50 NPSC-F	7.00	6.50	1.50	1.50	516434
515255	517888	E	2.00 NPSC-F	2.00 NPSC-F	8.00	10.25	2.00	2.00	516435
515256	517889	F	2.50 NPSC-F	2.50 NPSC	8.00	10.25	2.50	2.50	516435
516463*	517890	G	3.00 NPT-M	3.00 NTP-M	14.00	26.50	3.00	3.00	515135
516465*	517891	H	4.00 NPT-M	4.00 NPT-M	14.00	27.00	4.00	4.00	515135
517611*	517892	H	6.00 NPT-M	6.00 NPT-M	18.00	28.00	6.00	6.00	516515

* Feature 1/4" threaded tap for gauge connection on inlet and outlet

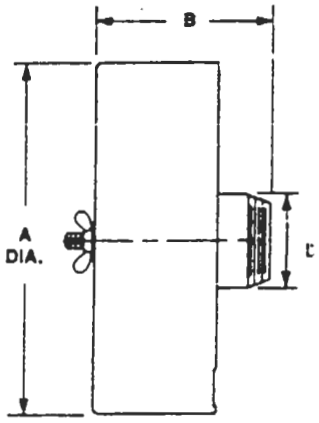
Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 606, S543, 6, 623, S7, S75
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 707, 808, S85, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 823, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 1223, 14, S15, P15 (Inlet Only)

Filtratio
Accessorie

Filter Silencers (Single Connection)

* For Supplemental silencing only. (Used to augment existing muffling systems.)

Filter/Silencers reduce noise levels while ensuring clean air is provided to the blower and the air distribution system. Normally used in pressure applications.



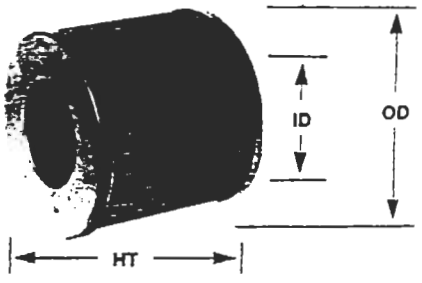
SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)

Standard Media Part Number	Z Media Filter Part Number	Reference Blower Model	Connection Inlet	Dimensions (Inches) A	B	C	Filter Element
516487	517878	B	1.00 NPT	6.00	6.50	1.00	515132
516489	517879	C,D	1.50 NPT	6.00	6.50	1.50	515132
516491	517880	E	2.00 NPT	10.00	7.25	2.00	515133
516493	517881	E	2.00 NPT	10.00	12.25	2.00	515134
516495	517882	F	2.50 NPT	10.00	12.50	2.50	515134
516497	517883	G	3.00 NPT	10.00	12.50	3.00	515134
516499	517884	H	4.00 NPT	16.00	14.00	4.00	515135
516513	517885	H	6.00 NPT	16.00	15.00	6.00	516515

Filter Element

All Rotron Air Filters and Filter/Silencers have replaceable filter elements. The filter media is polyester designed for high efficiency over a wide spectrum of industrial applications. See filter element cross reference table.



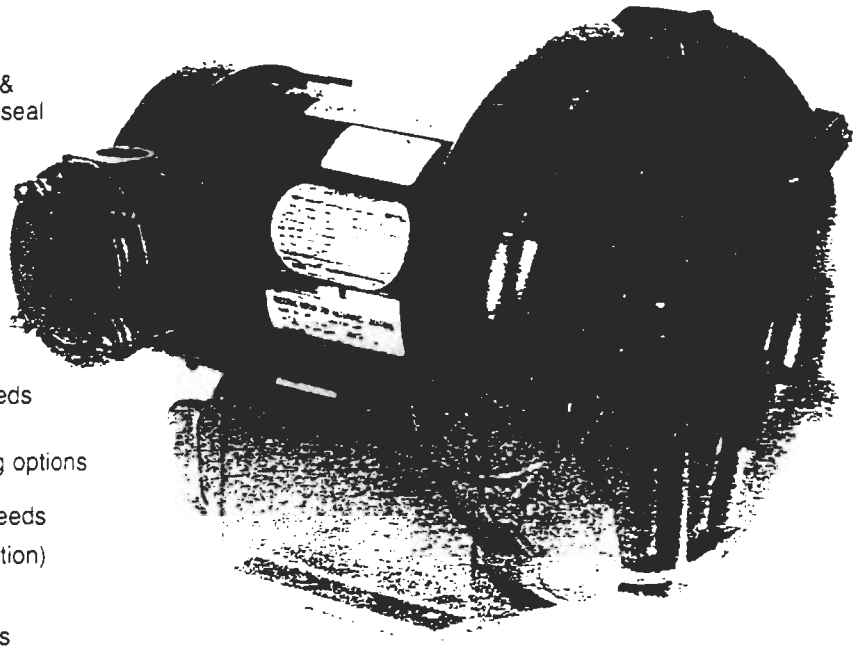
FOR DR BLOWER MODELS

Standard Replacement Filter Element Cross Reference Table					
271200	271078	515158	515134	516489	515132
477411	271078	515254	516434	516491	515133
515122	515132	515255	516435	516493	515134
515123	515133	515256	516435	516495	515134
515124	515134	516461	516434	516497	515134
515125	515134	516463	515135	516499	515135
515145	515134	516465	515135	516511	516515
515151	515135	516466	515132	516513	516515
515157	515133	516487	515133	517611	516515

Standard Media Part Number	Z Media Filter Part Number	ID (Inches)	OD (Inches)	HT (Inches)	Area (Sq/Ft)
515132	517873	3.00	4.38	4.75	1.5
515133	517874	3.63	5.88	4.75	2.3
515134	517875	4.63	5.88	9.50	4.5
515135	517876	4.75	7.88	9.63	8.3
516434	517893	2.56	5.00	4.75	2.0
516435	517894	3.50	5.88	8.75	4.5
516515	517877	8.00	11.75	9.63	19.0

EN 606 & CP 606
Explosion-Proof Regenerative Blower

FEATURES
- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 200 SCFM
- Maximum pressure: 75 IWG
- Maximum vacuum: 75 IWG
- Standard motor: 3.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

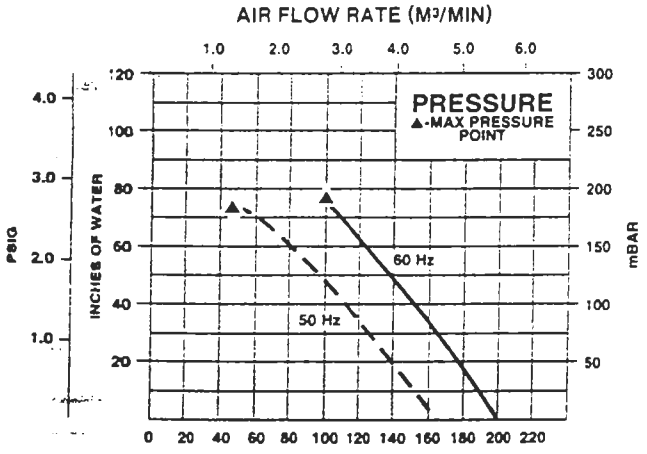


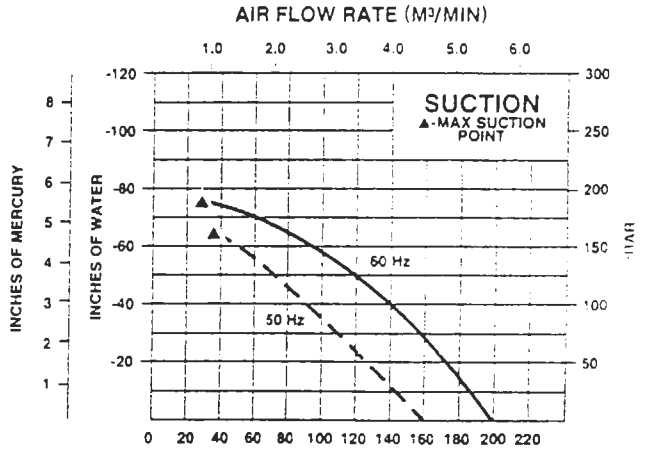
MOTOR OPTIONS
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES (See Catalog Accessory Section)
- Flowmeters reading in SCFM
- Filters & moisture separators
  Pressure gauges, vacuum gauges & relief valves
  Switches – air flow, pressure, vacuum or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

BLOWER PERFORMANCE AT STANDARD CONDITIONS

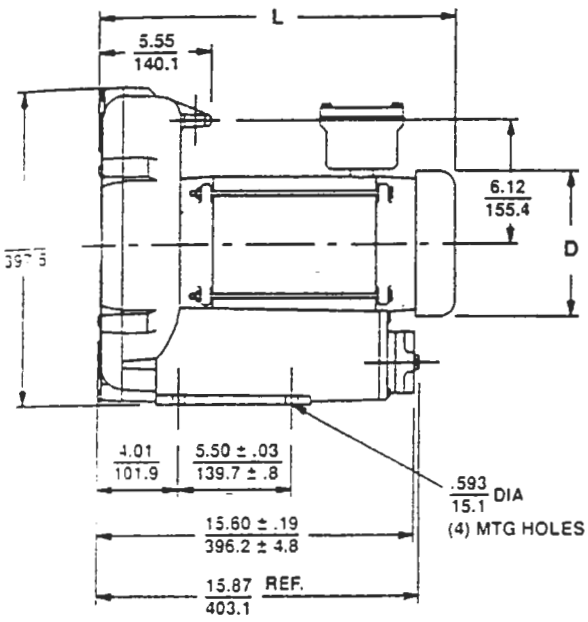


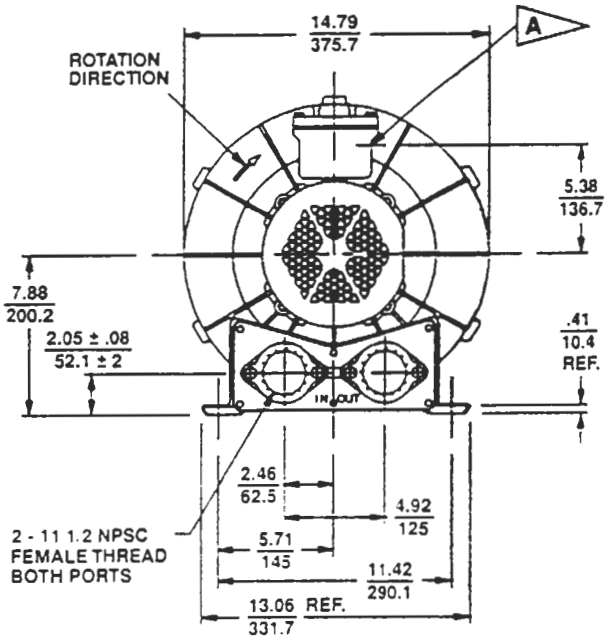


AMETEK Rotron TMD

EN 606 & CP 60
Explosion-Proof Regenerative Blowe

Scale CAD drawing available upon reque





DIMENSIONS: IN / MM
TOLERANCES: .XX ± .1 / 2.5
UNLESS OTHERWISE NOTED)

MODEL	L (IN) ± .3	L (MM) ± 8	D (IN) ± .1	D(MM) ±3
EN/CP606M72ML	17.89	454	7.2	182
EN/CP606M5ML	19.9	505	8.5	216

A — 0.75" NPT CONDUIT CONNECTION

SPECIFICATIONS

MODEL	EN606M5ML	EN606M72ML		EN606M86ML	CP606FU5MLR	CP606FU72MLR
Part No.	038538	038536		038437	–	038972
Motor Enclosure – Shaft Material	Explosion-proof – CS	Explosion-proof – CS		Explosion-proof – CS	Chem XP – SS	Chem XP – SS
Horsepower	3.0	3.0		3.0	Same as EN606M5ML – 038538 except add Chemical Processing (CP) features from catalog inside front cover	Same as EN606M72ML – 038536 except add Chemical Processing (CP) features from catalog inside front cover
Phase – Frequency [1]	Single - 60 Hz	Three - 60 Hz		Three - 60 Hz		
Voltage [1]	208-230	208-230	460	575		
Maximum Nameplate Amps	15.5-14.5	7.8-7.4	3.7	3.0		
Maximum Blower Amps [3]	19	7.6	3.8	3.1		
Inrush Amps	94-88	60-54	27	26		
Starter Size	1	0	0	0		
Service Factor	1.0	1.0		1.0		
Thermal Protection [2]	Class B - Pilot Duty	Class B - Pilot Duty		Class B - Pilot Duty		
XP Motor Class – Group	I-D, II-F&G	I-D, II-F&G		I-D, II-F&G		
Shipping Weight	130 lb (59 kg)	106 lb (48 kg)		106 lb (48 kg)		

[1] Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors a factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our du voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-22 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside o certified range.

[2] Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated moto or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet ambient temperatures above 40°C.

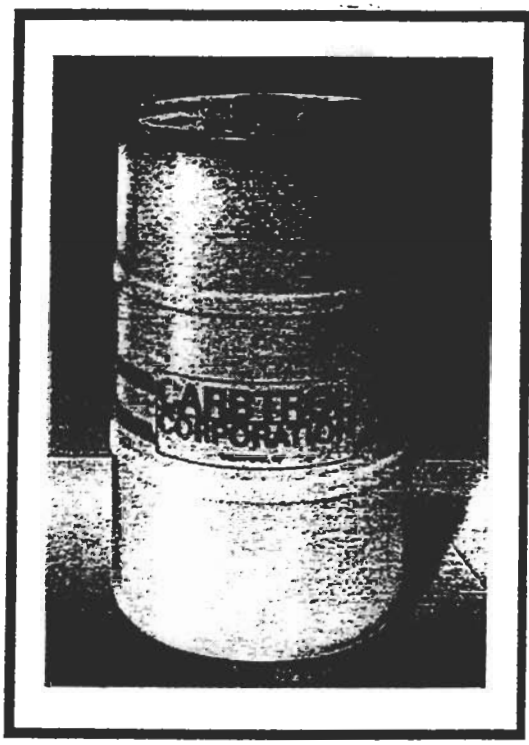
[3] Maximum blower amps corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and ambient temperature reaches the maximum operating temperature.

Specifications subject to change without notice. Please consult your Local Field Sales Engineer for specification updates.

CARBTROL®

AIR PURIFICATION CANISTERS 140-200 LB. ACTIVATED CARBON

G-1
G-2
G-3



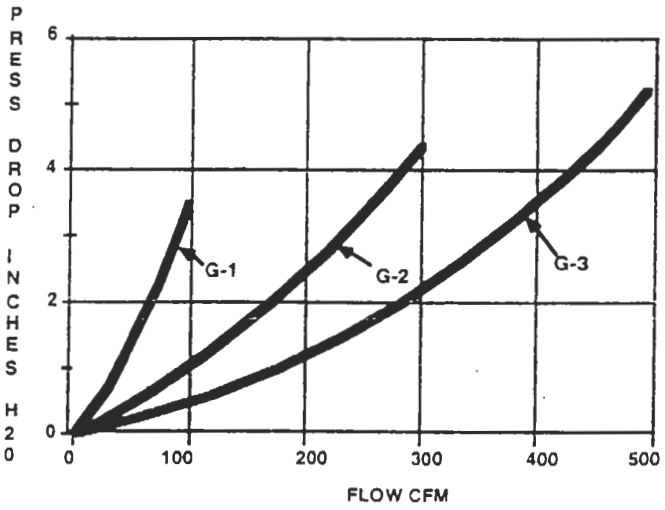
The CARBTROL "G" Canisters handles flows up to 500 CFM.

FEATURES

- High activity carbon.
- Epoxy lined steel or polyethylene construction.
- Acceptable for transport of hazardous spent carbon.
- Side drain for removal of accumulated condensate.
- Low pressure drop.
- PVC internal piping.
- High temperature (180°F) steel units available.

APPLICATIONS

- Soil vapor remediation
- Air stripper exhausts
- Tank vents
- Exhaust hoods
- Work area purification
- Sewage plant odor control



AT-116

CARBTROL CORPORATION

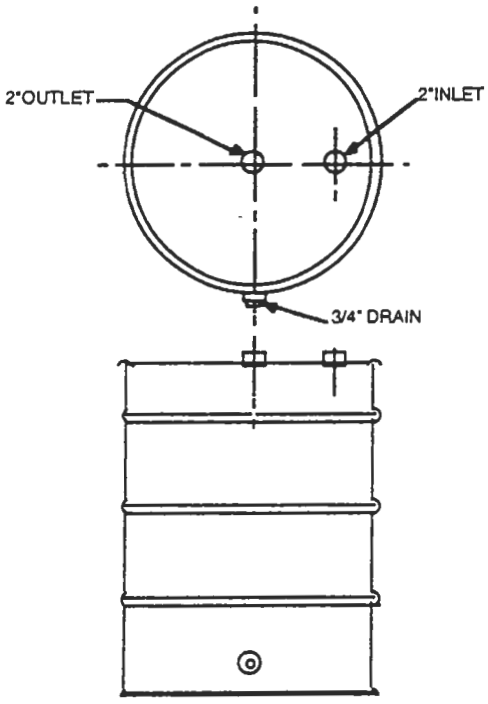
51 Riverside Avenue
Westport, CT 06880

1-800-242-1150 • Fax # (203) 226-5322
Web Address: http://www.carbtrol.com

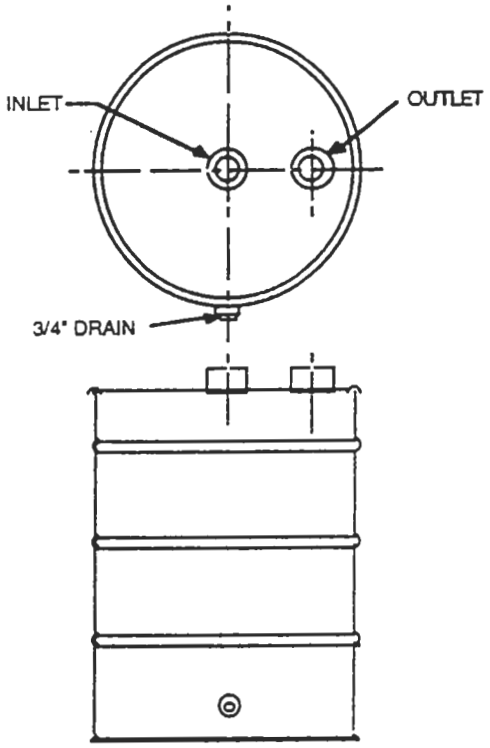
CARBTROL®

AIR PURIFICATION CANISTERS 140-200 LB. ACTIVATED CARBON

G-1
G-2
G-3



MODEL G-1



MODEL G-2,G-3

SPECIFICATIONS

MODEL	DIAMETER/HEIGHT	CARBON WEIGHT	INLET/OUTLET	MAXIMUM RATED FLOW	APPROXIMATE SHIP WEIGHT
G-1*	24"/36"	200 lbs.	2"/2"	100 CFM	240 lbs.
G-2*	24"/36"	170 lbs.	4"/4"	300 CFM	210 lbs.
G-3P	24"/36"	140 lbs.	6"/6"	500 CFM	180 lbs.
G-3S	24"/34"	140 lbs.	4"/4"	500 CFM	180 lbs.

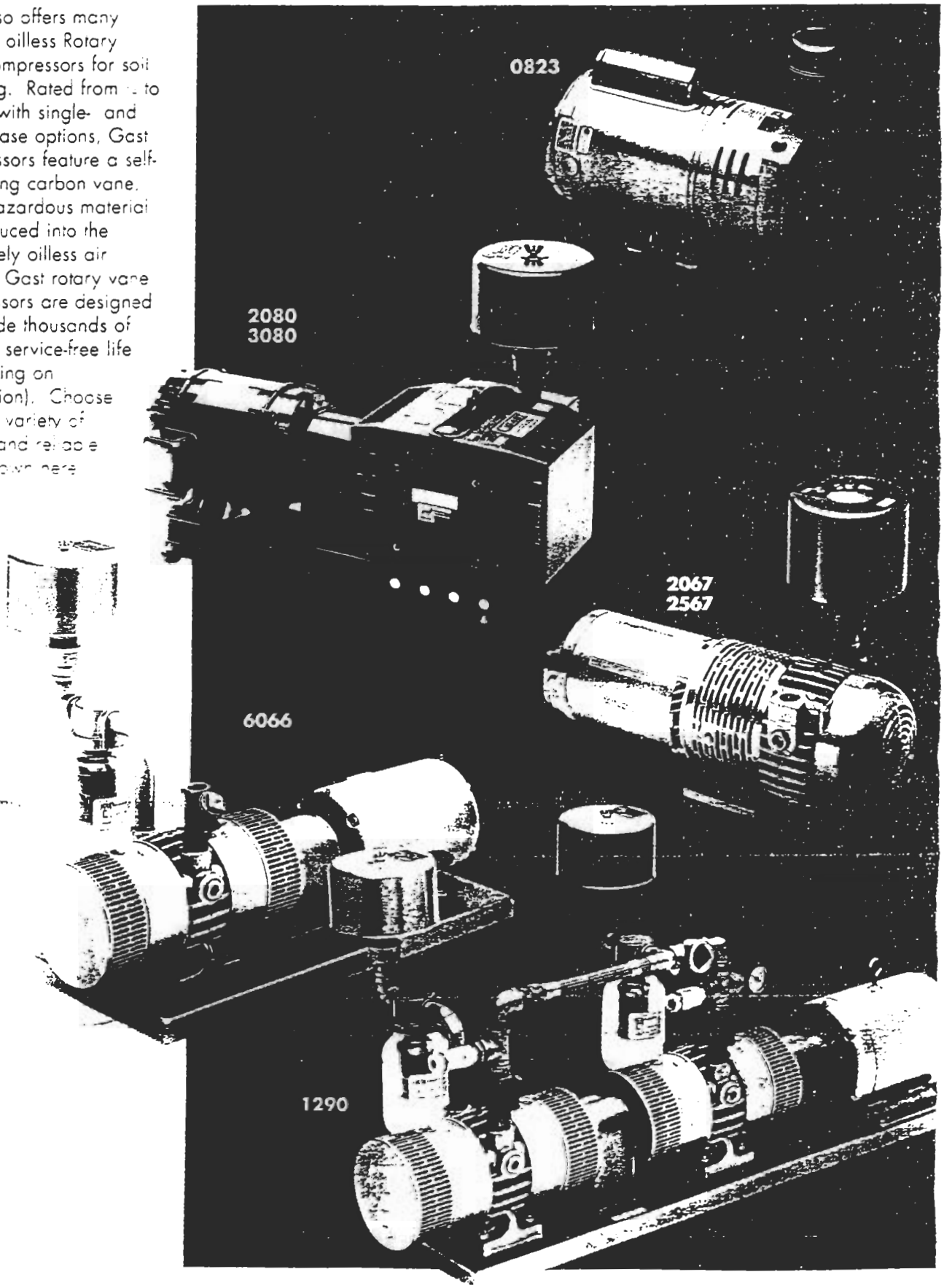
* Specify: Polyethylene (P) or Epoxy Lined Steel (S)

SAFETY

Certain chemical compounds in the presence of activated carbon may oxidize, decompose or polymerize. This could result in temperature increases sufficient to cause ignition of the activated carbon or adsorbed material. If a compounds reaction with activated carbon is unknown, appropriate tests should be considered.

CARBTROL® CORPORATION
51 Riverside Avenue
Westport, CT 06880
1-800-242-1150 • Fax # (203) 226-5322
Web Address: http://www.carbtrol.com

Gast also offers many types of oilless Rotary Vane compressors for soil sparging. Rated from ¼ to 15 HP, with single- and three-phase options, Gast compressors feature a self-lubricating carbon vane, so no hazardous material is introduced into the completely oilless air stream. Gast rotary vane compressors are designed to provide thousands of hours of service-free life (depending on application). Choose from the variety of rugged and reliable styles shown here.



SPARGING – COMPRESSORS – ROTARY VANE

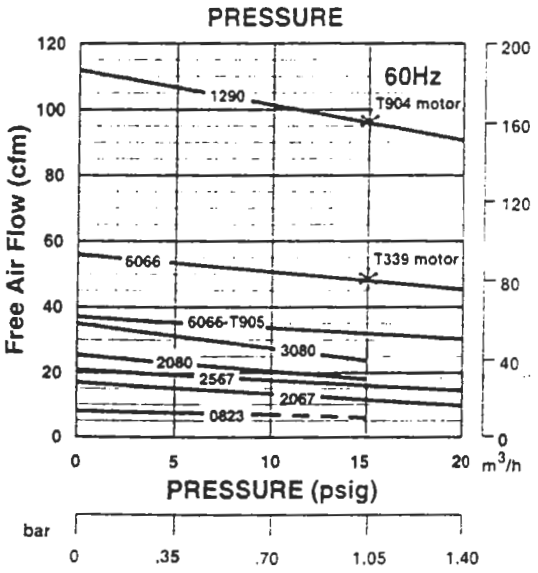
Product Specifications Model Number	Motor Specifications Phase	Hz	Voltage	HP	Max. Pressure @ 60Hz psig	1 bar	Max. Flow @ 60Hz cfm	m³h	Net Wt. lbs	kg
0823-P155-G608X*	Single	50	100-110/220-240	0.75	10 (15 inter)	0,7 (1,0)	8	14	50	23
		60	100-115/208-230							
2080-P124-T337	Three	60	230/460	2.0	15	1,0	25	42	135	61
2080-P124-T906X	Single	60	115/230	3.0	15	1,0	25	42	135	61
3080-P124-T338	Three	60	208-230/460	3.0	15	1,0	35	59	160	72
3080-P124-T907X	Single	60	208-230	5.0	15	1,0	35	59	160	72
2067-P118-G470X†	Single	60	115/230	1.5	20	1,4	17	29	84	38
2067-P118-G471*†	Three	50	220/380-415	1.0	20	1,4	17	29	84	38
		60	208-230/460	1.5						
2567-P132-G475†	Three	60	230/460	2.0	20	1,4	21	36	85	38
2567-P132-T908X†	Single	60	115/230	2.0	20	1,4	21	36	85	38
6066-P122-T339***†	Three	60	208-230/460	5.0	15	1,0	55	93	205	92
6066-P122A-T905 **†	Three	60	208-230/460	5.0	20	1,4	37	63	205	92
6066-P122A-T909†	Three	60	208-230/460	7.5	20	1,4	55	93	205	92
1290-P110-T904**†	Three	60	208-230/460	10	15	1,0	112	190	430	194
1290-P110A-T910†	Three	60	208-230/460	15	20	1,4	112	190	440	198

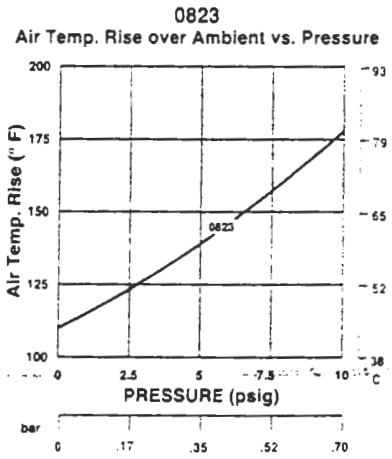
*For 50Hz performance reduce air flow on grid by approximately 17%.

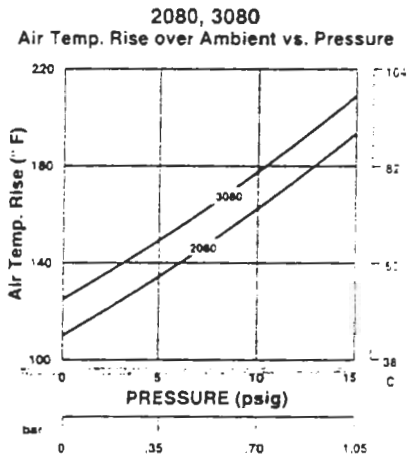
**6 pole motor; 1140 RPM

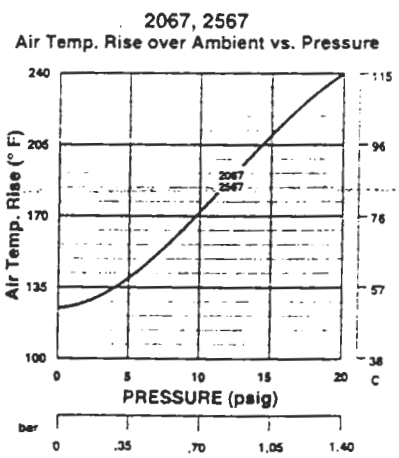
***These models are capable of 15 psi max. performance, reference performance grid below

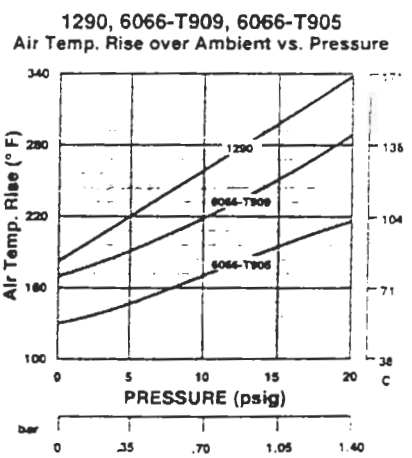
†Also available as separate drive, less the motor. To order as a separate drive version, specify the first two sets of digits only of this model number. Consult factory or distributor for the correct Nema frame size motor to use. Customer supplied motor must have minimum service factor of 1.15





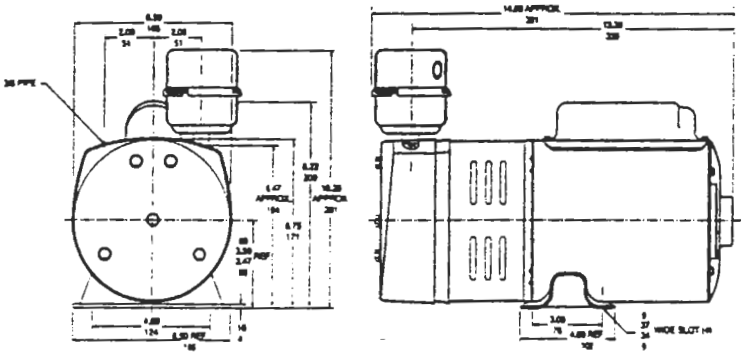






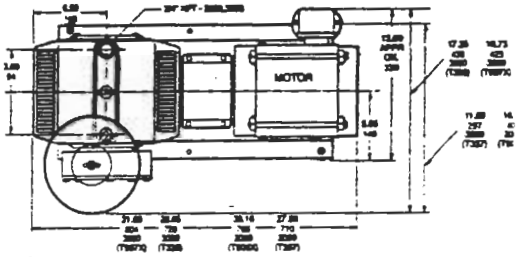
(mm) (inches)

Model 0823

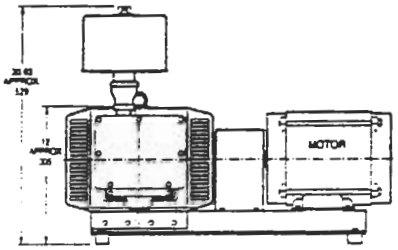


Models 2080, 3080

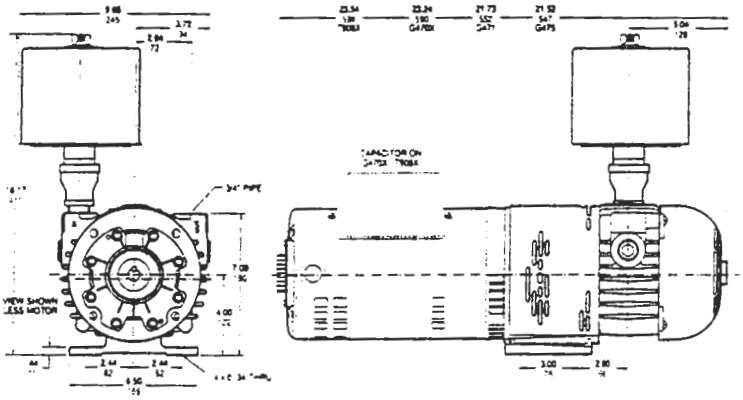
Top view



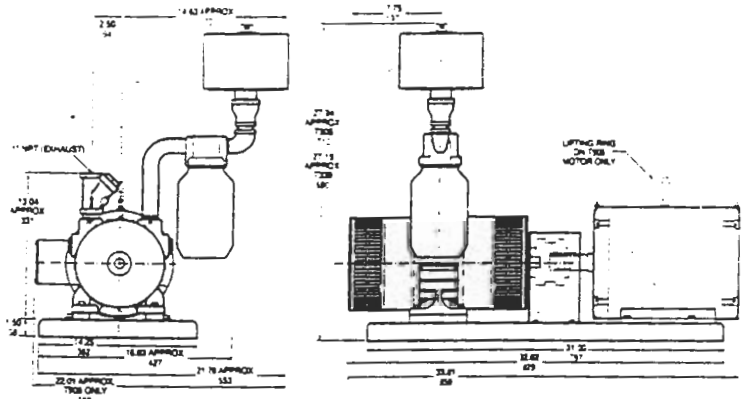
Side view



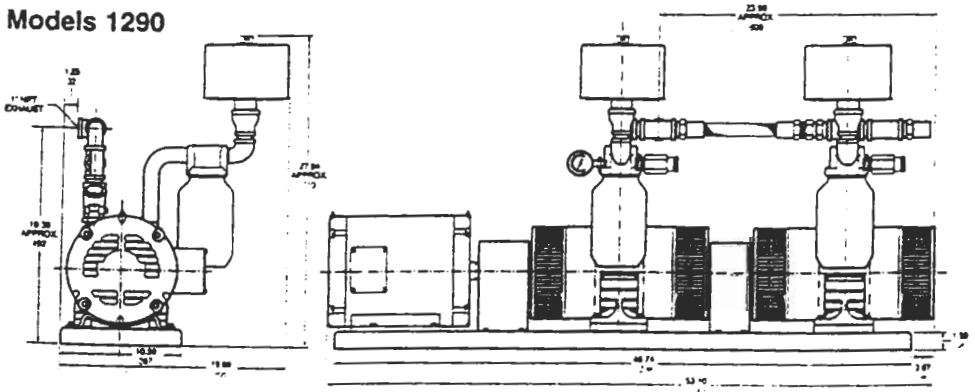
Models 2067, 2567



Models 6066



Models 1290



NOTICE: Overall length dimensions are reference only, due to optional motor sizes available

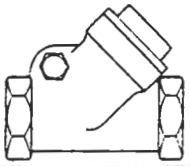
Pressure-Vacuum Gauge

To monitor the system performance so maximum duties are not exceeded. Using two gauges (one on each side of the filter) is a great way to know when the filter needs servicing.

AJ497	Vacuum gauge	0-60" H_2O, 1/4" NPT connection	Blowers
AE134	Vacuum gauge	0-160" H_2O, 1/4" NPT connection	Blowers
AE134F	Vacuum gauge	0-15" HG, 1/4" NPT connection	R4H Blower
AA644B	Pressure gauge	0-30 psi, 1/4" NPT	80 Series, 2567, 2067, 6066, 0823
AE133	Pressure gauge	0-160" H_2O, 1/4" NPT connection	Blowers
AE133A	Pressure gauge	0-200" H_2O, 1/4" NPT connection	Blowers
AE133F	Pressure gauge	0-15 psi, 1/4" NPT connection	R4H Blower
AJ496	Pressure gauge	0-60" H_2O, 1/4" NPT connection	SVE Blowers

Check Valve

Designed to prevent back-wash of fluids that would enter the blower. Also prevents air back-streaming if needed. Can be mounted with discharge either vertical or horizontal. Valve will open with 3" of water pressure.



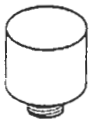
AH326D	Check valve	1-1/2" NPT (3" H_2O cracking pressure)	Blowers
AH326F	Check valve	2" NPT (3" H_2O cracking pressure)	Blowers
AH326G	Check valve	2-1/2" NPT (3" H_2O cracking pressure)	R7 Blower

Relief Valve

By setting a relief valve at a given pressure/vacuum you can ensure excessive duties will not harm the blower or products in your application.

AG258

AN225

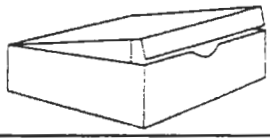


PV Series

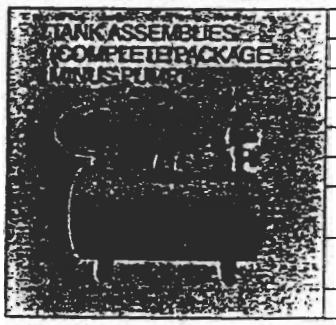
AA307	Relief valve	For pressure, 3/4" NPT, adjustable 2-25 psi	6066, 2567 Series
AA600	Relief valve	For pressure. 3/8" NPT, adjustable 2-30 psi	0823
AG258	Relief valve	1-1/2" NPT adjustable 30-170" H_2O, vac. or press., 200 CFM max.	Blowers
AG258F	Relief valve	2-1/2" NPT adjustable for higher flows, vacuum or pressure	Blowers
PV065	Relief valve	For pressure, pre-set for 6.5 psi, 1-1/4" NPT connection (60Hz)	R3H Blower
PV072	Relief valve	For pressure, pre-set for 7.2 psi, 1-1/4" NPT connection (60Hz)	R3H Blower
PV098	Relief valve	For pressure, pre-set for 9.8 psi, 1-1/4" NPT connection (50Hz)	R4H Blower
PV102	Relief valve	For pressure, pre-set for 10.2 psi, 1-1/4" NPT connection (60Hz)	R4H Blower
AN225	Relief valve	15-45 cfm, 3/4" NPT connection, adjustable 0-20 psi	2080, 3080, 4080 Series

Service Kit

If pump performance on rotary vane models diminishes, installation of the Service Kit replacement parts will have it performing like new again.



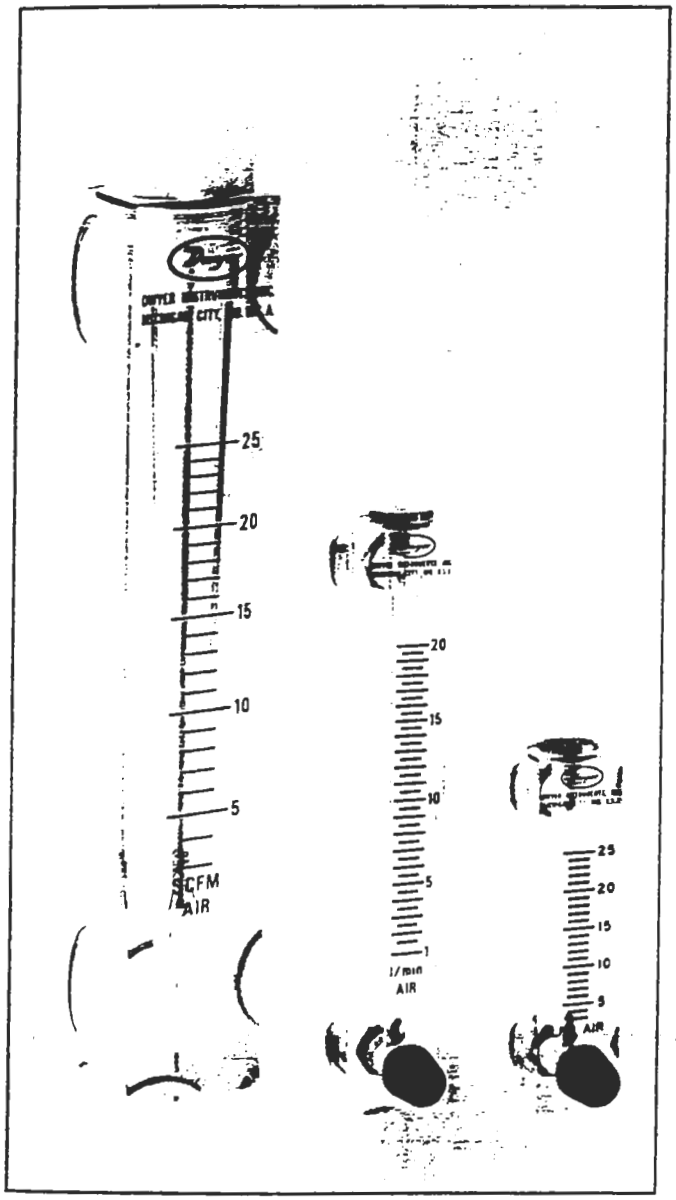
K479A	Service Kit	Includes items for unit repair	0823 Model
K504	Service Kit	Includes items for unit repair	6066, 1290 (uses 2)
K583	Service Kit	Includes items for unit repair	2567 Models
K584	Service Kit	Includes items for unit repair	2080, 3080, 4080 Models
K585	Service Kit	Filter/Muffler Kit only	2080, 3080, 4080 Models

ACCESSORY	PART NO.	DESCRIPTION	USED ON
	AB140	¾" BORE, 5" P.D., SINGLE GROOVE	1550, 2065, 2565
	AB140A	9/16" BORE, 5" P.D., SINGLE GROOVE	1065
	AB140C	½" BORE, 5" P.D., SINGLE GROOVE	VAB, VB8
	AC374	⅞" BORE 6.5" P.D., SINGLE GROOVE	10 × 1040
	AC374B	⅞" BORE 6.5" P.D., SINGLE GROOVE WITH HUB	11 × 1740, 3040
	AC376	⅞" BORE 6.5" P.D., DOUBLE GROOVE	3040
	AC374C	¾" BORE 6.5" P.D., SINGLE GROOVE	2065, 2565, 4565
	AC376B	1" BORE 6.5" P.D., DOUBLE GROOVE	4565
	AC376D	1⅛" BORE 6.5" P.D., DOUBLE GROOVE	2565, 4565
	AK670A	⅝" BORE 6" P.D., SINGLE GROOVE	PCD, PCA
	AD139A	½" BORE 3.7" P.D., SINGLE GROOVE	0440
	AH255	32 OUNCES OF NON-FLAMMABLE FLUSHING SOLVENT	*
	AH255A	16 OUNCES SPRAY CAN OF NON-FLAMMABLE SOLVENT	*
	AF265	DIAPHRAGM-TYPE UNLOADING PRESSURE SWITCH 10-100 PSI RANGE, 20-30 LB. DIFFERENTIAL	ROA-DOA
	AF564	DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 20-30 LB. DIFFERENTIAL	ALL SIMPLEX SYSTEMS
	AG527S	LIKE AF564 WITH 6-FOOT ELECTRICAL POWER CORD ATTACHED	1HAB, 1LAA, 2HAH
	AE163A	DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 10-13 LB. DIFFERENTIAL	PISTON UNITS FOR DR SPRINKLER INDUSTRY
	AK620	DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 6 LB. MINIMUM DIFFERENTIAL	PISTON UNITS FOR DR SPRINKLER INDUSTRY
	AF599D	2 GALLON TANK ASSM FOR ROA & DOA SERIES (PRESSURE)	DOA/ROA-P106T-AA
	AF599	2 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (PRESSURE)	1HAB, 2HAH
	AF599A	2 GALLON TANK ASSM FOR 56 FRAME PISTON (PRESSURE)	4HCC, 5HCD
	AK329	2 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (LOW PRESSURE)	1LAA-11T-M100X
	AF600	12 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (PRESSURE)	1HAB, 2HAH, 3HB8
	AF600B	12 GALLON TANK ASSEMBLY FOR 56 FRAME PISTON (PRESSURE)	4HCC, 5HCD, 6HCA
	AF601	20 GALLON TANK ASSEMBLY FOR 2 CYLINDER 56 FRAME PISTON (PRESSURE)	4HCC, 5HCD, 6HCA
	AF252	20 GALLON TANK ASSEMBLY FOR 4 CYLINDER 56 FRAME PISTON (PRESSURE)	6HDK, 7HDD, 8HDM
	AF606	30 GALLON TANK ASSEMBLY FOR 56 FRAME PISTON (PRESSURE)	5HCD, 6HCA, 7HDD, 8HDM
	AG258	RELIEF VALVE, 1½" NPT, ADJUSTABLE 30-170" H_2O	FLOWS BELOW 200 CFM (MAY NEED 2 ON SOME BLOWER APPLICATIONS
	AE238	CHECK VALVE, ¼" NPT	ALL RECIPS UP TO ½ Hi 0211, 0240-440, 0323, 0523
	AJ824	CHECK VALVE, ⅜" NPT	0465, 0765, 0740, 0870, 0823, 1023
	AH326A	CHECK VALVE, ¾" NPT	2067, 2567, 2065, 2565, 3040, 11 × 1740
	AH326B	CHECK VALVE, 1" NPT	4565, 5565, 6066, R1, R2
	AH326C	CHECK VALVE, 1¼" NPT	R3
	AH326D	CHECK VALVE, 1½" NPT	R4, R5, SDR4, SDR5
	AH326F	CHECK VALVE, 2" NPT	R6, R6P, R6PP, R6PS, SDR6, SDR6P
	AH326G	CHECK VALVE, 2½" NPT	R7
	AA203	RELIEF VALVE, ⅛" NPT ADJUSTABLE 2-25 PSI	FLOWS BELOW 2 CFM
	AA205	RELIEF VALVE, ¼" NPT ADJUSTABLE 2-25 PSI	FLOWS BELOW 2 CFM
	AA600	RELIEF VALVE, ⅜" NPT ADJUSTABLE 2-30 PSI	FLOWS BELOW 15 CFM
	AA307	RELIEF VALVE, ¾" NPT ADJUSTABLE 2-25 PSI	FLOWS BELOW 50 CFM
	AE960	RELIEF VALVE, 1" NPT ADJUSTABLE 2-20 PSI	FLOWS BELOW 60 CFM
	AE248	MANUAL DRAIN VALVE, ¼" NPT	ALL SYSTEMS
	AG528H	AUTOMATIC DRAIN VALVE, ¼" NPT	OPTION FOR SYSTEMS
	AF682A	TANK SAFETY VALVE, ¼" NPT (ASME CODED)	ALL SYSTEMS

***FOR ANSWERS ON FLUSHING PROCEDURES, CONSULT YOUR GAST REP/DISTRIBUTOR OR GAST FACTORY SERVICE DEPARTMENT OR REFER TO YOUR PARTS LIST AND OPERATING PROCEDURES.**

Series VF Visi-Float® Flowmeters

Precision machined from solid acrylic – Used to indicate or manually control air or gas flow from .1 SCFH to 100 SCFM . . . water from .6 GPH to 20 GPM



(VFCII shown above)

Dwyer Visi-Float® flowmeter bodies are cut and precision machined from solid, clear acrylic plastic blocks. This construction not only produces a handsome finished product, but permits complete visual inspection. As a result, the Dwyer Visi-Float® flowmeters are especially popular for medical and laboratory equipment applications.

Scales are easy to read – The front scale location and white background provides excellent visibility. The direct reading scales are hot stamped into the plastic and will not wear off. Mid-range calibration is established with a master flowmeter. Accuracy is ±5% of full scale for VFA models, ±3% for VFB, and ±2% for VFC. Scales average 2" long on the VFA models, 4" long on VFB, and 5" long on VFC.

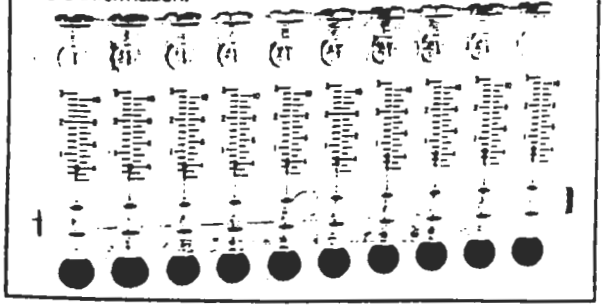
Durable and attractive construction – The machined acrylic bodies of the Dwyer Visi-Float flowmeters are practically unbreakable. Fabrication is backed by over 60 years of experience in acrylic instrument machining. The tapered bore is precision machined to a smooth surface that provides perfect visibility of the indicating float. The VFA and VFB models are available with either brass or stainless steel inlet and outlet connections and are tapped for ¼" NPT Thread. VFB models 85 and 86 have either ½" back or ¾" end connections. The VFC models have PVC 1" NPT female connections and VFCII units are equipped with acetal thermoplastic 1" NPT male fittings. VFCII fittings also include hex wrench flats to prevent stripped threads. All standard models employ Buna-N "O" rings for leak proof operation and are available with either back or end connections for horizontal or vertical piping. Precision metering valves in brass or stainless steel are available for most VFA and VFB models. VFC models, intended for use with external metering valves, include a stainless steel guide rod and large diameter float for excellent stability and visibility at higher flow rates. Two options are offered for VFCII units, specifically designed for applications requiring FDA approved materials. Choose 316 stainless steel float and guide rod and Viton® "O" rings. See OPTIONS for ordering codes.

Easy installation – All Visi-Float® flowmeters have metal mounting inserts on rear for panel mounting. They can also be supported directly by system piping.

OEM specials – See page 5 of this bulletin for a small sampling of custom designed flowmeters we have built.

Special Multi-Column Visi-Float Flowmeters

Perfect for OEM applications, Visi-Float flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.



How To Order

1. Select series by letter designation, VFA, VFA–EC, VFA–SS, VFA–EC–SS, VFB, VFB–EC, VFB–SS, VFB–EC–SS, VFC, VFC–EC, VFCII or VFCII–EC.
2. Add ordering number to specify range. Example: VFB–50.
3. Add suffix BV for brass valve, SSV for stainless steel valve. Example: VFB–50–SSV.
4. For adjustable pointer flag add –PF. Available only on VFA and VFB. Example: VFB–50–SSV–PF.
5. Add additional options or accessories as required.

	SPECIFICATIONS
Meter Body	Acrylic plastic. Metering tube machined into body
Wetted Metal Parts	VFA & VFB-Brass std., SS opt. VFC-SS std.
Floats	St. Steel, Blk. Glass, Alum., K Monel
Float Stops	Stainless Steel Springs
Pipe Connections	VFA & VFB-¼" NPT (See note at right under dimensions)* VFC-1" NPT
"O" Rings	Buna-N
Mounting Inserts	10-32x6" deep
Scale	Hot pressed into acrylic body
Knobs	ABS Plastic
Maximum Pressures and Temperatures	VFA & VFB without valve: 100 PSIG (690 kPa)@ 150°F (85°C) 150 PSIG (1034 kPa)@ 100°F (38°C) VFA & VFB with valve: 100 PSIG (690 kPa)@ 150°F(85°C) VFC: 100 PSIG (690 kPa) @ 120°F(48°C)
Accuracy	Model VFA, 5%; Model VFB, 3% Model VFC, 2% of full scale

	OPTIONS	CODE
Metering Valve & Connection	Brass (VFA, VFB)	BV
	Stainless Steel (VFA, VFB)	SSV
Connections only	Stainless Steel (VFA, VFB)	SS
End Connections	Fittings on bottom and top (All Models)	EC
Pointer Flag	Red ABS Plastic (VFA, VFB)	PF
FDA Acceptable	316 SS float and guide rod (required, VFCII)	FDA
FDA Acceptable	Viton O-rings (required, VFCII)	VIT

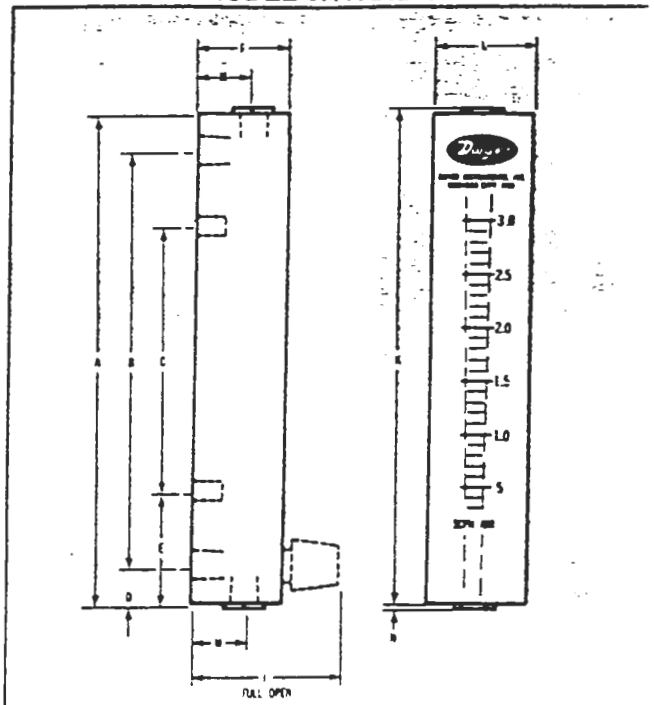
Series VF VISI-FLOAT® Models and Range
STOCKED MODELS in bold

Model VFA — 2" Scale				Model VFB — 4" Scale	
Range SCFH Air	Ordering No.	Range LPM Air	Ordering No.	Range SCFH Air	Ordering No.
.1-1	1	.06-0.5	21	.3-3	50
.2-2	2	.15-1	22	1-10	91
.6-5	3	.6-5	23	2-20	51
1-10	4	1-10	24	4-40	52
2-20	5	3-25	25	10-100	53
4-30	6	6-50	26	15-150	54
5-50	7	10-100	27	20-200	55
10-100	8			SCFM Air	
20-200	9			.3-3	90
CC Water per min.		Gal. Water per hour		CC/Min. Air	
				100-1000	60
6-50	32	.6-5	41	LPM Air	
10-100	33	2-10	42	.2-4	65
20-200	34	3-20	43	1-10	66
		8-40	44	1-20	67
				3-30	68
Model VFC — 5" Scale				4-40	69
Range SCFM Air	Order-ing No.	Range GPM Water	Order-ing No.	CC/Min. Water	
2.5-25	121	.5-5	141	2-30	82
5-50	122	1-10	142	GPH Water	
10-100	123	2-20	143	.5-12	80
				1-20	83
				6-60	81
LPM Air		LPM Water		GPM Water	
60-700	131	2-20	151	.2-2	85
200-1400	132	4-40	152	.5-5	86
300-2800	133	10-75	153		

Prices (Add $10.40 to VFB prices for ranges 85 and 86.)

VFA	$21.40	VFA-EC	$20.80
VFA-SS	24.50	VFA-EC-SS	24.00
VFA-BV	26.60	-PF pointer flag	1.00
VFA-SSV	35.50	-RKA regulator kit	64.90
VFB	$30.10	VFB-EC	$30.30
VFB-SS	32.80	VFB-EC-SS	32.40
VFB-BV	36.10	-PF pointer flag	1.00
VFB-SSV	43.90	-RK-VFB regulator kit	64.90
VFC	$74.40	VFCII-EC	$74.40
VFC-EC	74.40	-FDA (VFCII only)	7.50
VFCII	74.40	-VIT (VFCII only)	3.75

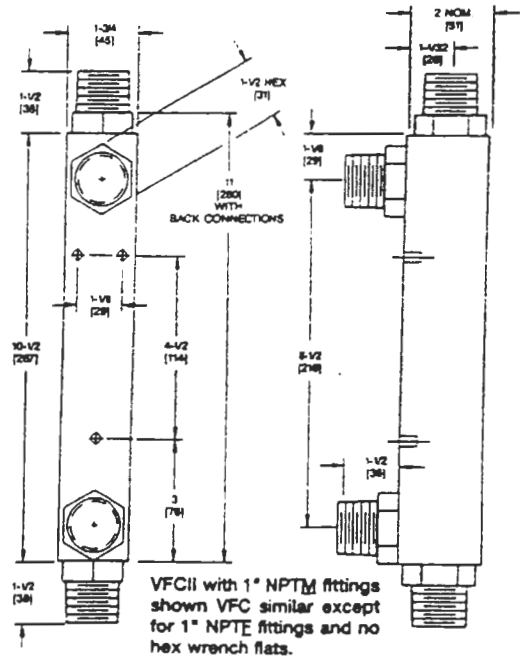
MODEL VFA AND VFB



DIMENSION-IN INCHES		
	Model VFA	Model VFB
A	4	6½
B	3 (¼ NPT female)	5½ (¼ NPT female)*
C	1⅜ (10-32 Thread)	3½ (10-32 thread)
D	½	½
E	1 3/16	1½
F	1¼	1¼
I	2 1/16 (BV or SSV)	2 1/16 (BV or SSV)
K	4½	6 1/16
L	1	1¼
M	¾ (EC)	¾ (EC)
N	½ (EC)	½ (EC)

*VFB ranges 85 and 86 have ¼" NPT back connections or ⅜" NPT end connections. These ranges not available with brass valves.

MODEL VFCII



VFCII with 1" NPTM fittings shown VFC similar except for 1" NPTF fittings and no hex wrench flats.

Appendix 3

Construction Details

For

Groundwater Monitoring Wells

Soil Vapor Extraction Wells

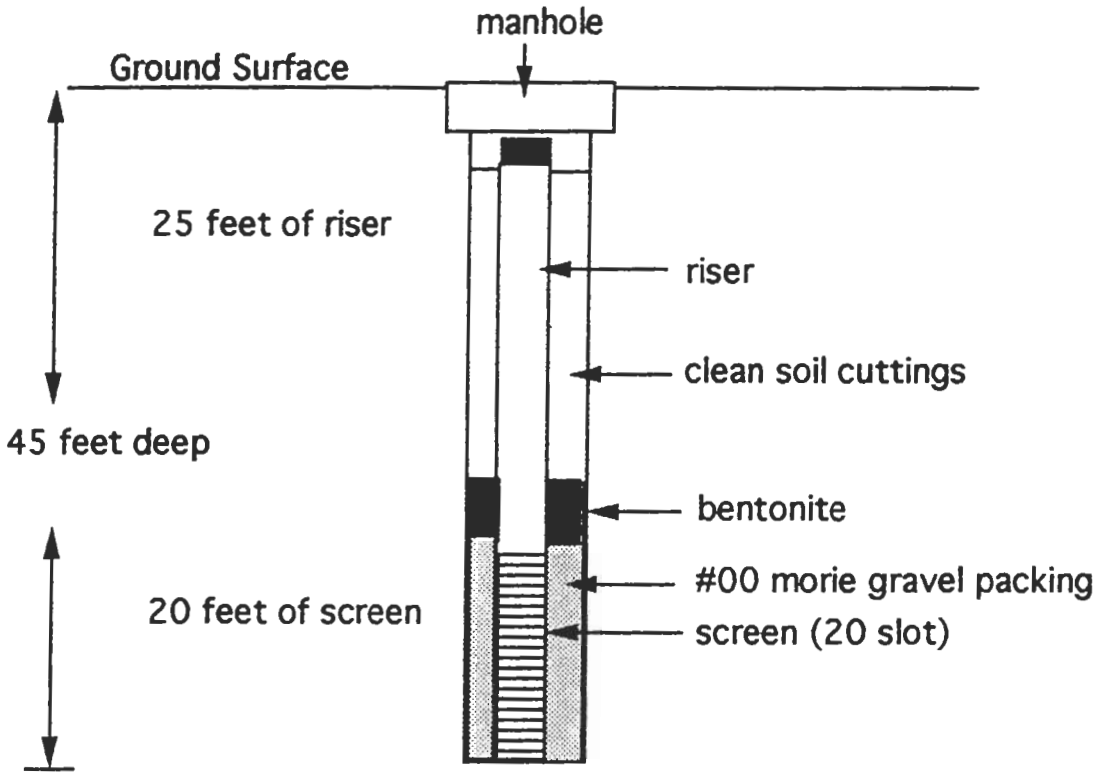
Vapor Monitoring Piezometers

Construction Details For
Groundwater Monitoring Wells and
Soil Vapor Extraction Wells
Westbury Valet Dry Cleaners

Well ID #	Vapor or Monitoring	Total Depth	Screen Interval (s)	Slot Size	Date Installed	Intermediate Seals/Depths
MW # 1	Monitoring Water	40.55 ft bgs	25-40.55 ft	# 20	3/17/99	# 2 Morie/40.55-25 ft Gravel Pack/ 25-23 ft Clean Cuttings to Grade
MW # 2	Monitoring Water	44.21 ft bgs	25-44.21 ft	# 20	3/17/99	# 2 Morie/44.21-25 ft Gravel Pack/ 25-23 ft Clean Cuttings to Grade
MW # 3	Monitoring Water	44.6 ft bgs	25-44.6 ft	# 20	3/17/99	# 2 Morie/44.60-25 ft Gravel Pack/ 25-23 ft Clean Cuttings to Grade
RW-1S	Vapor	21 ft bgs	11-21 ft	# 10	7/19/01	# 0 Morie/ 21-9.75 ft # 00 Morie/ 9.75-8.75 ft Bentonite Pellets/ 8.75-7.75 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 7.75-6.75 ft Bentonite Slurry/ 5.75-2.5 ft Clean Sand to Grade
RW-2S	Vapor	21 ft bgs	11-21 ft	# 10	7/19/01	# 0 Morie/ 21-9.5 ft # 00 Morie/ 9.5-9ft Bentonite Pellets/ 9-8ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 8-6.25 ft Bentonite Slurry/ 6.25ft-2.5 ft Clean Sand to Grade
RW-3S	Vapor	21 ft bgs	11-21 ft	# 10	7/19/01	# 0 Morie/ 21-10ft # 00 Morie/ 10-8.5 ft Bentonite Pellets/ 8.5-7.0 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 7.0-5.75 ft Bentonite Slurry/ 5.75-2 ft Clean Sand to Grade
RW-4S	Vapor	21t bgs	11-21 ft	# 10	7/19/01	# 0 Morie/ 21-10 ft # 00 Morie/ 10-8ft Bentonite Pellets/ 8-7 ft 10 Gallons H2O to Hydrate Pellets # 00 Morie/ 7-6 ft Bentonite Slurry/ 6-2.5 ft Clean Sand to Grade

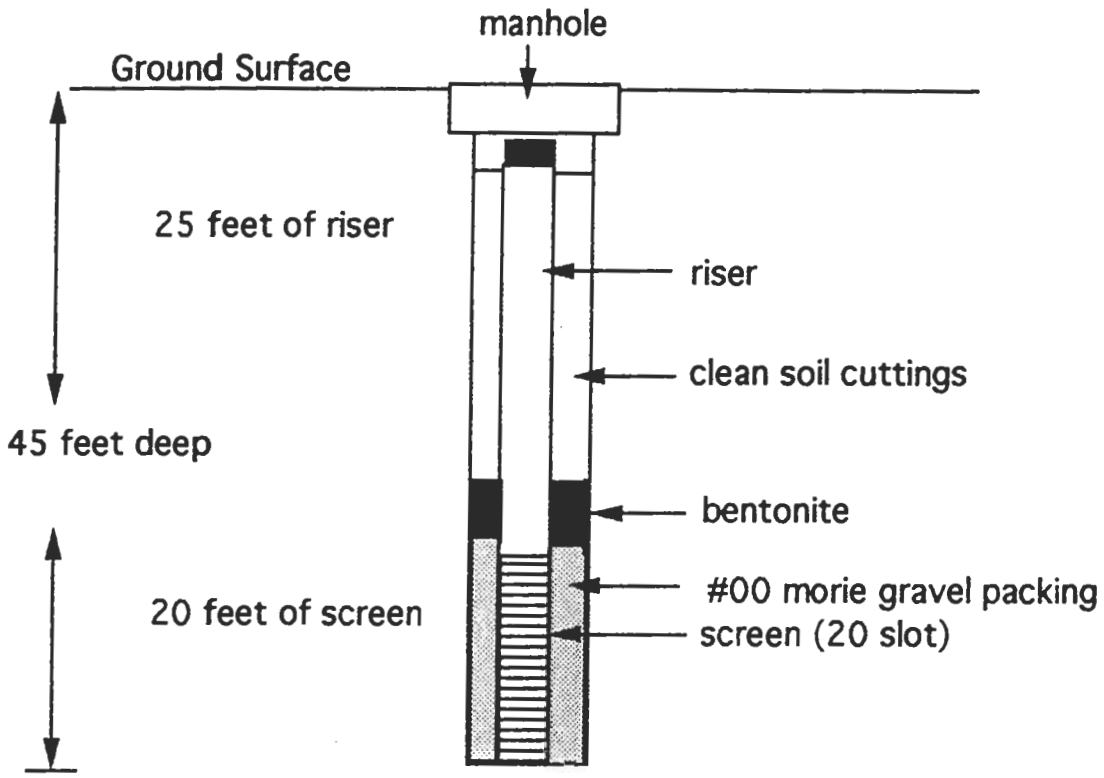
Construction Details For
Vapor Monitoring Piezometers
Westbury Valet Dry Cleaners

Well ID #	Vapor or Monitoring	Total Depth	Screen Interval (s)	Slot Size	Date Installed	Intermediate Seals/Depths
P-1	Monitoring Vapor	15 ft bgs	15-10 ft	# 10	7/20/01	# 0 Morie/ 15-9 ft # 00 Morie/ 9-7.5 ft Bentonite Pellets/ 7.5-6 ft 10 Gallons H2O to Hydrate Pellets Bentonite Slurry/ 6-2 ft Clean Sand to Grade
P-2	Monitoring Vapor	15.5 ft bgs	10.5-15.5 ft	# 10	7/20/01	# 0 Morie/ 15.5-9 ft # 00 Morie/ 9-8 ft Bentonite Pellets/ 8-6 ft 10 Gallons H2O to Hydrate Pellets Bentonite Slurry/ 6-2ft Clean Sand to Grade
P-3	Monitoring Vapor	15.5 ft bgs	10.5-15.5 ft	# 10	7/20/01	# 0 Morie/ 15.5-9 ft # 00 Morie/ 9-8.25 ft Bentonite Pellets/ 8.25-7.50 ft 10 Gallons H2O to Hydrate Pellets Bentonite Slurry/ 7.50-2 ft Clean Sand to Grade
P-4	Monitoring Vapor	15.5 ft bgs	10.5-15.5 ft	# 10	7/20/01	# 0 Morie/ 15.5-8.75 ft # 00 Morie/ 8.75-8.00 ft Bentonite Pellets/ 8-7ft 10 Gallons H2O to Hydrate Pellets Bentonite Slurry/ 7-2 ft Clean Sand to Grade
P-5	Monitoring Vapor	16 ft bgs	11-16 ft	# 10	7/19/01	# 0 Morie/ 16-9.5 ft # 00 Morie/ 9.5-8.5 ft Bentonite Pellets/ 8.5-7.0 ft 10 Gallons H2O to Hydrate Pellets # 00 Moire/ 7.0-5.75 ft Bentonite Slurry/ 5.75-2 ft Clean Sand to Grade
P-6	Monitoring Vapor	14.5 ft bgs	9.5-14.5 ft	# 10	5/10/01	Installed Via Direct Push Bentonite Slurry at Grade



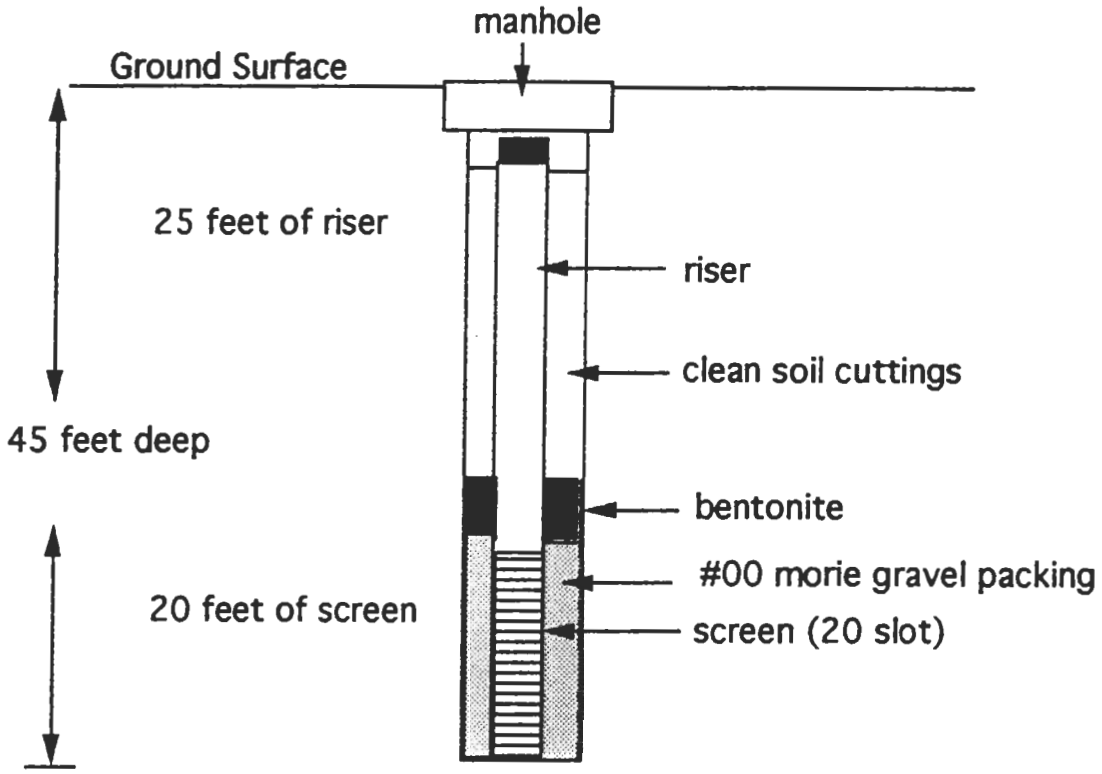
Monitoring Well MW-1 Construction Diagram
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

Anson Environmental Ltd.



Monitoring Well MW-2 Construction Diagram
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

Anson Environmental Ltd.



Monitoring Well MW-3 Construction Diagram
Westbury Valet Cleaners
123 Post Avenue
Westbury, New York

Anson Environmental Ltd.

Appendix 4

O & M Checklist for SVE/Air Sparge System

at

Westbury Valet Dry Cleaners

123 Post Ave
Westbury, NY 11590

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date _____ Inspected By: _____

Control Panel	Arrival	Departure
System	On / Off	On / Off
SVE Relief Valve	Open / Closed	cfm

SVE SYSTEM INSIDE TRAILER	
Was Moisture Separator Emptied?	Yes / No
Moisture Disposal Drum	F / 75 / 50 / 25 / E

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW1-S	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
RW2-S	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
RW3-S	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
RW4-S	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
RW1-D	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
RW2-D	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C
	cfm	ppm	inches of Water	O / 75 / 50 / 25 / C

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum	inch of water			inch of Water
Pressure		psi		
Flow	cfm	cfm	cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	ppm	ppm	ppm	
Temp	degrees F	degrees F	degrees F	

SVE Radius of Influence

Piezometer ID	Vacuum (inches of water)	Piezometer ID	Vacuum (inches of water)	Notes
P-1		P-6		
P-2		MW # 1		
P-3		MW # 2		
P-4		MW # 3		
P-5				

AIR SPARGE SYSTEM INSIDE TRAILER	
Cleaned Particulate Filter	Yes / No
Compressor Discharge Pressure	psi
Air Sparge Air Temperature	degrees F

AIR SPARGE WELL READINGS (INSIDE TRAILER)			
Sparge WELL #	**Pressure Reading**	**Air Flow**	**Notes**
AS Well #1	psi	SCFH	
AS Well #2	psi	SCFH	
	psi	SCFH	
	psi	SCFH	
	psi	SCFH	

DEPTH TO GROUNDWATER MEASUREMENTS			
Monitoring Well	**DTW (feet)**		
MW #1			
MW #2			
MW #3			

NOTES

Appendix 5

Instruction Manual

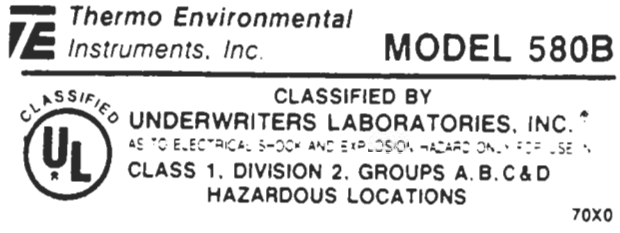
Model 580B OVM / Datalogger

Selected Manual Sections

INSTRUCTION MANUAL

OVM / DATALOGGER

MODEL 580B



THERMO ENVIRONMENTAL INSTRUMENTS INC.

8 WEST FORGE PARKWAY . FRANKLIN, MA 02038

TEL: (508) 520-0430 . TELEX: 200205 THEMO UR

FAX: (508) 520-1460

P/N 16860

REVISED 9/91

SECTION I

INTRODUCTION

1 INTRODUCTION

The 580B is a portable Organic Vapor Meter (OVM), which detects and quantitates most organic vapors with a highly sensitive photoionization detector (PID). The 580B has an operating range of 0-2000 parts per million (ppm) with a minimum detectable of 0.1 ppm. No support gases are required.

The 580B is controlled by a microprocessor which provides many features that were not previously available. Maximum signal hold, detector linearization, overrange lockout, IBM PC (or compatible) interface, extensive data logging capabilities and much more. With the many features provided by the 580B leak detection, head space measurements, and field survey are all easily accomplished. Completely portable, the 580B operates from internal batteries for eight hours in the field.

1.1 ABOUT THIS MANUAL

This manual is broken down into eight chapters. The first chapter (this one) provides a general overview of the 580B. Chapter two discusses, in great detail, the extensive facilities of the 580B. The focus of this chapter is on how to use the seven switches to access the various facilities. Chapter three explains, in detail, how to perform routine maintenance on the 580B. Chapter four is a technical discussion of calibration and methods for generating standards. Chapter five is a technical discussion of a few applications which illustrate some of the uses of the 580B. Chapter six is a technical discussion of methods for collecting a sample using the 580B. Chapter seven is a discussion of the communication facilities provided by the 580B. Chapter eight contains two flow charts which illustrate the 580B software flow. This chapter is a helpful tool for the new user. Appendix A is a detailed explanation of the 580B communication protocol. This chapter is provided in order to allow a programmer to develop specialized communication software for the 580B. There are several other addendums which contain miscellaneous information about the 580B.

1.2 INSTRUMENT OVERVIEW

This section describes various points of interest on the 580B. Each number refers to a number in Figure 1.1.

1. **POWER PLUG** - The power plug is used to run the instrument from its internal batteries. There is a chain attached to the power plug so that it will not be lost.

2. **RS-232 CONNECTOR** - This connector is used for communi-

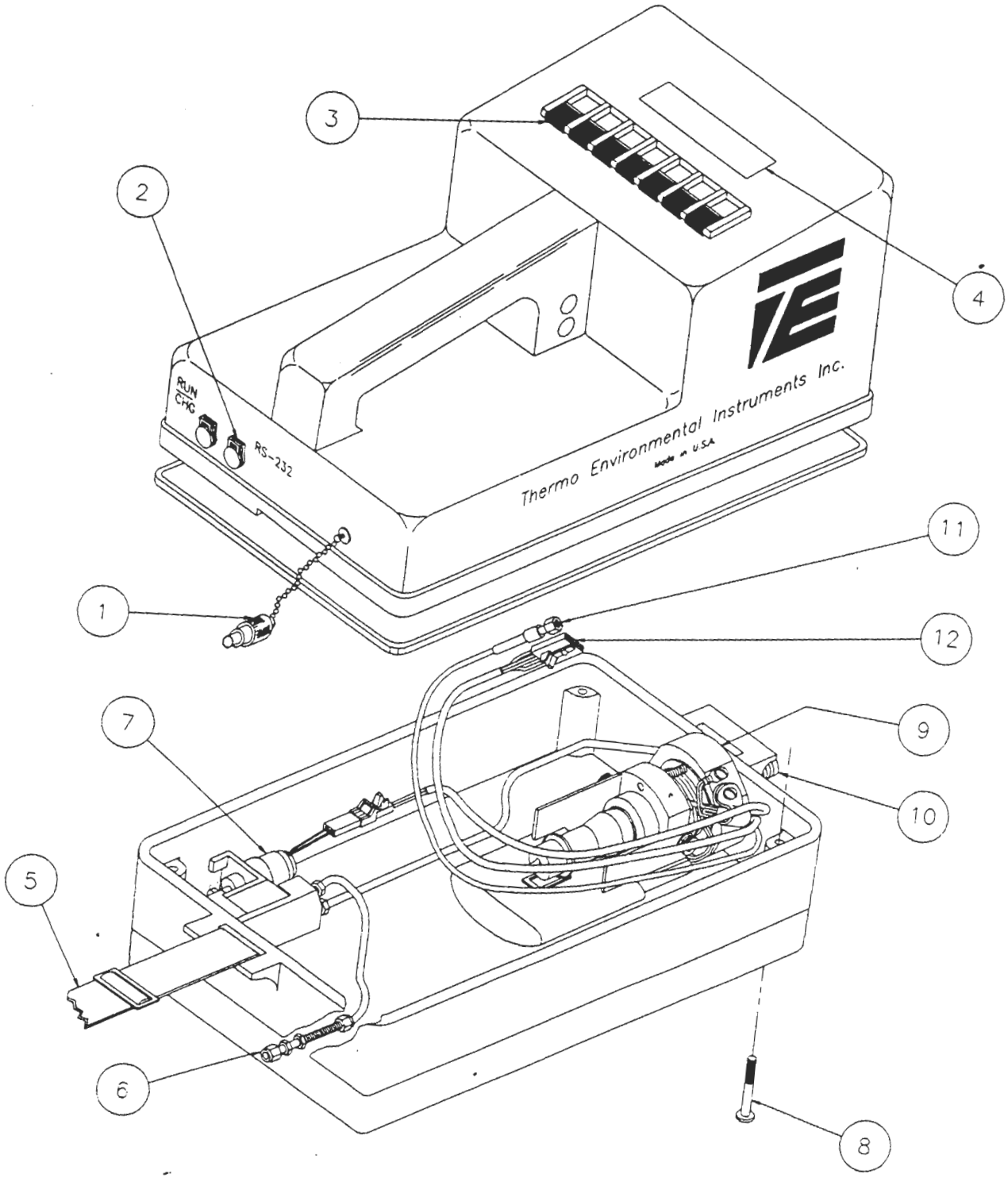


Figure 1.1
Instrument Assembly

cation with a serial printer or computer. A communication cable provided with the instrument fits into the receptacle.

3. **KEY PAD** - There are seven switches which operate the 580B. The switch marked ON/OFF is used to turn the pump and lamp on and off. The switch marked LIGHT will turn on backlighting for the two line display. The other five switches perform various functions. For a detailed description of the function of each switch see chapter two or the flow charts in chapter eight.

4. **DISPLAY** - The 580B has a two line by sixteen character display.

5. **SHOULDER STRAP** - There is an adjustable shoulder strap for carrying the 580B.

6. **SAMPLE EXIT PORT** - The 580B sample is drawn into the detector by a positive displacement pump and then sent back out through the exit port.

NOTE : The photoionization detector is a non destructive detector so the sample may be collected at the exit for further analysis (see Chapter Six).

7. **PUMP** - The 580B pump draws the sample into the detector.

8. **MOUNTING SCREWS** - There are four captive screws which hold the 580B top and bottom together. The screws are specially designed so that they do not fall out when they are loosened out of the case top.

9. **DETECTOR** - The photoionization detector is shown with the lamp and high voltage power supply.

10. **SAMPLE INLET** - Sample is drawn into the detector through the sample inlet at the front of the 580B.

11. **SIGNAL CABLE** - The PID signal is brought up to the microprocessor, for analysis, via the coaxial signal cable.

12. **BASE HARNESS** - The base harness plugs into a connector on the case top.

1.3 580B FEATURES

This section provides a brief overview of the various features of the 580B. After reading this section the user should have a good idea of what the instrument can do. Chapters two and three will explain, in detail, how each feature is selected.

TURNING ON PUMP AND LAMP - The pump and lamp are turned on by pressing the ON/OFF switch (the instrument power must already be on).

CALIBRATION - Calibration of the 580B is extremely impor-

tant. Chapter two explains how to calibrate the 580B in great detail. Chapter four discusses at length some of the basic theory and methods behind calibration. It is strongly suggested that this chapter be read in order to gain a deeper understanding of usage of the 580B. Chapter three also discusses calibration.

CONCENTRATIONS - Once the lamp and pump have been turned on the 580B begins to display the concentration of the incoming sample on the bottom line of the display. Normally the top line of the display will be a bar graph (logarithmic on a scale of zero to 2000). The operator may however select the MAX HOLD mode of operation. When in MAX HOLD, the top line of the display will show the highest concentration recorded.

LOGGING - The 580B provides extensive facilities for logging information. The operator may save a particular reading along with a six digit location code and a date and time stamp. If the 580B is in the MAX HOLD mode when logging is initiated then the max hold value will be logged.

AUTO LOGGING - Logging may be performed automatically by using the 580B's auto logging feature. Auto logging is not allowed while in the MAX HOLD mode. When auto logging is selected a LOGGING INTERVAL is selected (anywhere from one second to 99 minutes and 59 seconds). At the end of each logging interval the present concentration will be logged (the location code is automatically incremented each time).

AVERAGE - The 580B normally updates the concentration once per second. The operator has the option of setting the averaging time anywhere from one second up to four minutes.

NOTE : The bottom line of the display will be blank until the first averaging interval is completed. The top line will however be updated each second.

RESPONSE FACTOR - A response factor may be used in order to relate a particular gas to the calibration gas. When computing the displayed concentration the microprocessor multiplies the measured concentration by the response factor and displays the result. If the response factor is one, then the concentration is not changed. Chapters four and five explain some uses of the response factor.

LAMP SELECTION - The 580B allows for calibration data to be saved for one 10.0 eV lamp and one 11.8 eV lamp. This allows lamps to be switched in the field without requiring recalibration. A lamp serial number may also be entered.

ALARM - An alarm level may be selected. The 580B will sound an audible alarm (the top line will also indicate an alarm) whenever the concentration goes above the selected alarm level.

ACCESS - The 580B provides four access levels so that various features may be "locked out." User identification number

and instrument number are also provided.

CLOCK - The 580B has an internal clock which will run even when the instrument power is cut off.

COMMUNICATION - The 580B has a serial communication port for outputing data to a serial printer. Many of the 580B features may be accessed from a remote computer through the serial communication port (there is communication software available which will run on an IBM PC or clone).

DISPLAY LOGGED DATA - The logged data may be displayed on the 580B's two line display.

SECTION II

PRINCIPAL OF OPERATION

2.1 PHOTOIONIZATION DETECTOR OPERATION & THEORY

2.1.1 GENERAL

The sample is drawn into the ion chamber by a pump down stream of the detector. Here the sample is bombarded by ultra-violet light (UV) exciting the molecule. If the energy, (hU) of the UV light is greater than the ionization potential (IP) of the sample molecule (R) an electron will be removed, ionizing the molecule. A positively charged molecule and a free electron are produced, as :

$$R + hu \rightarrow R^+ + e^-$$

Several typical reactions follow:

C_6H_6 (benzene) + hu -> $C_6H_6^+ + e^-$ IP = 9.2 eV

$H_2C{=}CHCl$ (VCM) + hu -> $H_2C{=}CHCl^+ + e^-$ IP = 9.9 eV

C_3H_8 (propane) + hu -> $C_3H_8^+ + e^-$ IP = 10.9 eV

For this reason the ionization potential of the subject molecule plays an important role in selecting the lamp energy. Ionization potentials are expressed in electron volts (eV). A list of ionization potentials can be found in Appendix E of this manual or a more complete list in the CRC "Handbook of Chemistry and Physics".

2.1.2 LAMP ENERGIES

There are three lamps available from TEI, 10.0 eV, 10.6 eV, and 11.8 eV. The different energies are obtained by filling the lamp envelopes with different gases and selecting a window which will pass the wavelength produced when the gas is excited. The combination of gas and windows which produce these energies are listed below:

ENERGY	GAS	WINDOW	WAVELENGTH (nm)
10.0 eV	Krypton	MgF	123.6
10.6 eV	Krypton	MgF	117.4
11.8 eV	Argon	LiF	105.1

Though ionization potential will help the user select a lamp, it will not give any information as to the performance of

the detector in measuring a specific compound. The response of the system varies considerably from compound to compound even though they may have the same ionization potential. Some generalizations may help the user obtain a feeling for the difference in response between compounds.

2.1.3 COMPARATIVE RESPONSE

The following is an idealized response chart. No attempt is made to quantitate the relationship, it's a guideline.

Decreasing PID Response:
- Aromatic Compounds
- Unsaturated Compounds
- Saturated Compounds
- Ketones
- Alcohols
- Compounds with Sub Groups

It becomes obvious that sensitivity is influenced by the electronegativity of the molecule though this is not a predictable measure of performance. The only true test of performance is to measure the specific compound of interest and compare it to a good performing standard such as isobutylene.

2.1.4 RESPONSE FACTORS

This relative comparison with isobutylene mentioned above is a very effective way of measuring a variety of compounds without the need to recalibrate for each compound.

The development of a RESPONSE FACTOR allows the operator to correct the instrument's response given a one to one correspondence for all compounds measured, using isobutylene as the reference standard.

Note: Because there is variation in lamp production and hence performance, it is suggested that all calibration and subsequent development of response factors be done on the same lamp/instrument combination.

The preparation of standards and the development of response factors is discussed in subsequent sections of this manual. Once the response factor is generated, it is entered into the 580. The instrument automatically reports the concentration of the compound measured in relative units. It is important to recognize that all compounds measured at that time will be reported relative to the response factor entered in the instrument. For example, if we have calibrated the instrument on isobutylene and have entered a response factor for benzene, we will read concentrations with a one to one correspondence to benzene. If during these measurements toluene or any other compound is encountered, the instrument will report the concentration as if it was measuring benzene. For this reason care should be taken when using this facility.

The above discussion should give the reader a good overview of PID performance. To further understand the intricacies of the

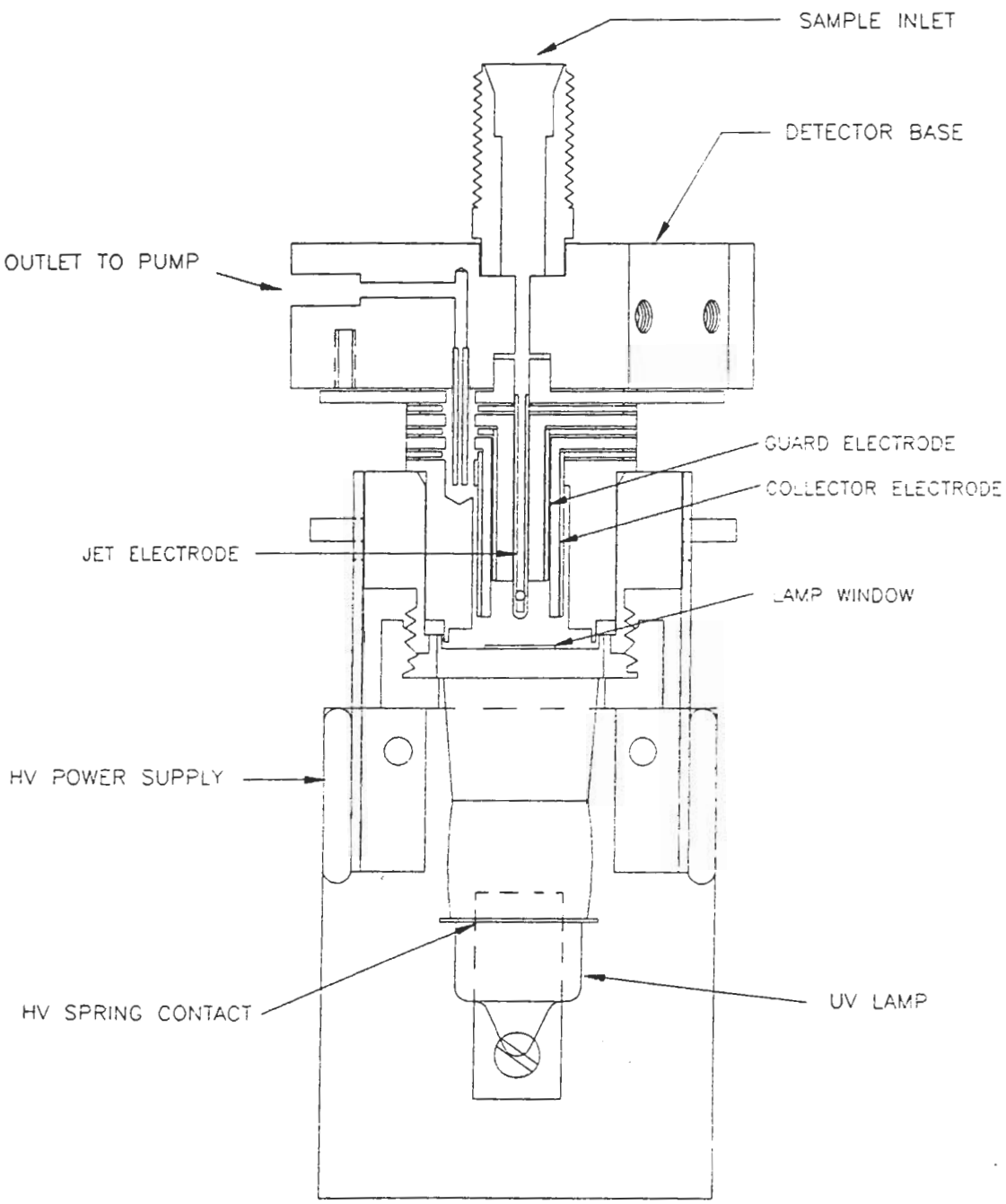


Figure 2.1
Photo Ionization Detector

instrument it is suggested that the user prepare a number of standards of different compounds and measure them relative to isobutylene. Included in this comparison should be several mixtures of compounds such as gasoline, paint thinner, or cleaning solvent, etc. Through this type of study the inequity of the PID response will be better understood making the Model 580 a more effective tool. The use of the instrument is discussed in greater detail in subsequent sections.

2.1.5 PHOTOIONIZATION DETECTOR

The detector is constructed of Teflon and stainless steel to eliminate chemical interaction with the surfaces that are encountered by the sample. To further reduce possible interaction with the surfaces, the flow rate thru the detector is high, 400 - 500 cc/min developing a very dynamic transport of the sample.

Referring to Figure 2.1, the sample is drawn into the ionization chamber through the jet electrode where the UV radiation from the lamp ionizes the sample. A bias voltage of several hundred volts is applied to the jet to aid in the collection of ions. As a result of the ionization process and the impingement of the UV energy from the lamp on the sample, positively charged ions and free electrons are produced. The jet is negative relative to the collector where the electrons are collected.

Between the jet and the collector, separated on both sides by Teflon, is the guard electrode. Its function is to eliminate surface currents which could flow between the two active electrodes. When the Teflon surfaces become dirty during use, there can be the development of a conduction path on the Teflon, which increases in high humidity situations. The guard electrode eliminates this path. The collector electrode is connected to the electrometer which measures the ion current produced during the ionization process. The sample is moved through the detector by an external pump which is on the exit of the detector.

2.2 PROGRAM OPERATION

2.2.1 INTRODUCTION

The 580B has seven switches located just below the display. They are labeled:

ON/OFF MODE/STORE RESET LIGHT +/INC -/CRSR SPKR

The ON/OFF switch toggles the lamp and pump power between on and off. The MODE/STORE, RESET, +/INC, -/CRSR and SPKR switches all have various meanings (including none at all) depending upon the mode. The SPKR switch normally is used to toggle the instrument speaker between on and off. Pressing the MODE/STORE switch will cause the 580B to return to the Run mode, except when the 580B is already in this mode. In which case it will cause the 580B to enter the Log mode.

The LIGHT switch is used to illuminate the display.

The 580B has several modes. Some of the modes may have sub modes. The modes and sub modes are tabulated below.

Run mode
    Concentration meter normal
    Max hold
Log mode
Parameter mode
    Calibration mode
Access mode
Clock mode
Communication mode

The following sections will describe each mode and how to get to them and through them. It is strongly suggested that this section be carefully read and that the 580B be used along with the manual in order to re-enforce the manual.

2.2.2 POWER FOR LAMP AND PUMP

When the 580B is first turned on (see section 1.3) the display will indicate that the lamp is not lit. Pressing the ON/OFF switch will tell the microprocessor to turn on the lamp and the pump. The microprocessor will send power to the lamp and pump and then "look" to see if the lamp is actually lit. If it did not light then the microprocessor will try again.

If after fourteen seconds the lamp still will not light, then the microprocessor will indicate a lamp out condition.

In the event that the microprocessor is unable to light the lamp, check the seating of the lamp (see section 3.1). If the problem persists, call service.

Once the lamp is lit, the display will show the PPM (parts per million) on the bottom line. The top line will either be a bar graph or the maximum reading (see section 2.2.3).

To turn the lamp and pump off simply press the ON/OFF switch.

2.2.3 RUN MODES

The 580B has two run modes, Max Hold and Concentration meter. The run mode is selected in the Parameters section (see Section 2.4). In the concentration meter mode the top line of the display will be a bar graph. The bar graph is a logarithmic bar graph over the range of 0 to 2000 PPM. The bar graph is intended as a rough visual indication of the current PPM. The bottom line will indicate the exact PPM.

In the Max Hold mode the top line of the display will indicate the maximum reading. The bottom line of the display will indicate the current PPM. Whenever a new maximum is seen, the top line will be updated. The Max Hold reading may be reset by pressing the RESET switch while in the run mode.

2.2.4 LOG MODE

The ability to "log" data is one of the 580B's greatest

features. Readings may be stored for later analysis. Each reading will have a date and time as well as a location code associated with it. Up to over 700 readings may be stored. Logged data may even be sent to a printer or computer via an RS-232 serial communication port (see section 2.7).

The Log mode is entered from the Run mode by pressing the MODE/STORE switch. When this switch is pressed from the Run mode the display will show:

LOG THIS VALUE?

on the top line and either PPM or MAX PPM on the bottom line depending upon which run mode the 580B is currently in. By pressing the +/INC switch the display will then show:

LOC. CODE 000001

on the top line (the actual location code may not be 000001). The location code may now be entered. By pressing the +/INC switch the number above the cursor may be incremented. By pressing the -/CRSR switch the cursor may be moved to the next digit. The 580B automatically increments the location code each time a data point is logged.

Once the desired location code has been entered, pressing the MODE/STORE switch will "log" the data point. This means that the reading displayed on the bottom line, along with the location code, the current date and the current time will be stored into the 580B's memory. The 580B will then return to the Run mode.

If for any reason logging is not desired, pressing the RESET switch rather than the MODE/STORE switch will cause the value not to be stored. The 580B will then go back to displaying:

LOG THIS VALUE?

Pressing the mode switch will now return the 580B to the Run mode.

It is possible, when attempting to log a data point, that rather than the display showing "LOC. CODE 000001" it will show "BAR CODE: ." Don't be alarmed. This has happened becouse the location mode selection is not properly set. Section 2.4.3 describes how to set this parameter. Pressing the mode/store switch will cancel the logging operation and return to the run mode. The location mode selection should be changed as described in section 2.4.3.

2.2.4A AUTO LOGGING MODE

The 580B may be instructed to automatically log data according to a predefined time interval. AUTO LOGGING is selected from within the Parameters section (see section 2.4). At the end of the logging interval (settable from 1 second up to 99 minutes and 59 seconds) the current average ppm value will be logged and the logging interval will be restarted.

NOTE: Auto logging is not allowed with the Max Hold mode.

2.2.5 SPEAKER

While the 580B is in the Run mode the speaker may be turned on. The speaker will generate a "clicking" which will increase in speed as the concentration increases. The purpose of the speaker is to give the operator an audible indication of the PPM. The speaker may be turned on or off by pressing the SPKR switch. The speaker rate may also be changed by changing the switches located inside of the instrument. Only one of the four speaker rate switches should be on (in the down position) at any time.

2.2.6 LOW BATTERY

The 580B will display a warning when the battery is low. The warning will be a flashing B in the left hand corner of the bottom line of the display when the 580B is in the Run mode. The 580B should be recharged when the low battery warning is activated.

2.2.7 OVERRANGE

The 580B will display an overrange warning if the concentration goes above 2000 PPM. The top line of the display will show:

OVERRANGE

Once an overrange condition occurs the instrument will "lock out". This means that the overrange warning will continue to be displayed until the instrument is brought to a "clean" area. A clean area is defined to be an area where the concentration of organic vapors is below 20 PPM. The 580B will continue to indicate PPM on the bottom line during an overrange condition.

2.2.8 ALARM

The 580B has an alarm which will sound if the PPM rises above the alarm setting. The alarm setting is entered in the Parameters mode (see section 2.4.3). If the speaker is not activated then the alarm will of course not be heard. Once the PPM drops below the alarm setting the alarm will turn off. The top line of the display will also indicate when there is an alarm condition.

2.3 MAIN MENU

By pressing the MODE/STORE switch from the Run mode and then pressing the -/CRSR switch when asked if logging is desired,

the 580B will display the main menu:

```
R/COMM     -/PARAM
+/ACCESS   S/CLOCK
```

The other four operating modes (Communication, Parameters, Access and Clock) may be entered from the Main menu. The operating mode may always be returned to by pressing the MODE/STORE switch.

2.4 PARAMETERS MODE

All of the 580B operating parameters are entered in the Parameters mode. The 580B is also calibrated from within the Parameters mode.

The Parameters mode may be entered by pressing the -/CRSR switch from the main menu.

There are nine different sections in the Parameters mode.

1. Run mode selection
2. Auto logging selection
3. Location mode selection
4. Average time selection
5. Alarm setting
6. Lamp selection
7. Response factor setting
8. Calibration
9. Free space indication

Pressing the +/INC switch will advance the 580B to the next section. Pressing the -/CRSR will advance the 580B to the previous section. Each section and any of its sub-sections will be described in the following pages. It is important to note that when the 580B is in a sub-section of any of the above sections that the +/INC and -/CRSR switches will have a different meaning. This may seem confusing at first but will become clear after stepping through each section.

2.4.1 RUN MODE SELECTION

There are two Run modes. Concentration meter normal and Max Hold (see Section 2.2.3). The top line of the display will show:

CONC. METER

the bottom line will show:

"RESET" TO CHG

the bottom line will alternate every two seconds with:

MAX HOLD

if the 580B is in the Max Hold mode. Pressing the RESET switch will cause the 580B to show:

MAX HOLD
+ = USE/ - = NO

if the +/INC switch is pressed then the Max Hold mode will be selected. If the -/CRSR switch is pressed then the Concentration meter normal mode will be selected. In either case the 580B will then return to the previous screen.

2.4.2 AUTO LOGGING SELECTION

The 580B can be configured to automatically log data points. The top line of the display will show:

```
AUTO LOGGING
```

The bottom line will alternate between "RESET TO CHG." and "ON" or "OFF". Pressing the RESET switch will cause the 580B to show:

```
AUTO LOGGING
+/ON    -/OFF
```

Pressing the -/CRSR switch will turn auto logging off and return operation to the previous screen. Pressing the +/INC switch will enable auto logging and allow setting of the logging interval. The display will show:

```
INTERVAL  00:01
"RESET"WHEN DONE
```

The +/INC switch will increment the number above the cursor and the -/CRSR switch will move the cursor. The logging interval format is MM:SS (where M is minute and S is second). Pressing the RESET switch will return operation to the first auto logging screen.

2.4.3 LOCATION MODE SELECTION

The 580B may be configured to accept a six digit location code which is entered via the keypad. There is an alternate method for entering location codes however UL approval has not yet been obtained for this option. For updated information contact Thermo Environmental Instruments inc.

The display shows the currently selected location mode. For example the display will show:

```
Loc. code mode
"reset" to chg.
```

When the 580B is configured to enable operator editing of the location code, pressing the RESET switch causes the 580 to show:

```
Bar code mode
"reset" to chg.
```

The 580B is now configured for the alternate location mode (which is not presently available for use in hazardous locations). Pressing the reset switch will cause the 580B to be configured for location code mode.

2.4.4 AVERAGE TIME SELECTION

The 580B can be configured to display the average PPM from once a second up to once every four minutes. The display will show:

AVERAGE = 0:01
"RESET" TO CHG

Pressing the RESET switch will cause the 580B to show:

AVERAGE = 0:01
"RESET"WHEN DONE

The +/INC switch will increment the number above the cursor and the -/CRSR switch will move the cursor. The average time format is M:SS (where M is minutes and S is seconds).

NOTE: The maximum averaging interval is four minutes.

2.4.5 ALARM SETTING

The 580B will display the current alarm setting on the top line of the display. The setting may be changed by simultaneously pressing the RESET switch with either the +/INC switch to increment the digit above the cursor or the -/CRSR switch to move the cursor.

2.4.6 LAMP SELECTION

The 580B will display:

LAMP

on the top line. The bottom line will alternate every two seconds between:

"RESET" TO CHG

and the currently selected lamp setting and its associated serial number.
i.e.

11.8eV 000000

By pressing the RESET switch, the 580B will display:

+/10eV -/11eV

on the bottom line. Pressing the +/INC switch will select the 10.0 eV lamp. Pressing the -/CRSR switch will select the 11.8eV lamp. In either case the 580B will then allow editing of the lamp serial number. The display will show:

```
SERIAL #  000000
"RESET"WHEN DONE
```

The +/INC switch will increment the number above the cursor and the -/CRSR switch will move the cursor. Pressing the RESET switch will return operation to the original lamp screen.
When using a 10.0 eV lamp or a 10.6 eV setting should be selected. When using an 11.8 eV lamp the 11 eV setting should be selected.

2.4.7 RESPONSE FACTOR SETTING

The current Response Factor setting will be displayed on the top line of the display. The Response Factor may be changed by simultaneously pressing the RESET switch with either the +/INC switch to increment the digit above the cursor or the -/CRSR switch to move the cursor.

The response factor is used to equate the response of one organic vapor with that of the calibration gas. The current reading is always multiplied by the response factor in order to obtain the displayed concentration. A response factor of one will not change the displayed concentration.

2.4.8 CALIBRATION

The 580B will display:

```
"RESET" TO
 CALIBRATE
```

The calibration mode may be entered by pressing the RESET switch.
The 580B will display:

```
RESTORE BACKUP
    + = YES
```

The previous calibration information may be restored by pressing the +/INC switch. The 580B will then return to the previous screen. If the backup is not desired, by pressing the -/INC switch the calibration routine will continue. The display will show:

```
ZERO GAS
RESET WHEN READY
```

Once zero gas has been introduced the RESET switch should be pressed. The 580B will then zero the instrument. The 580B will display:

MODEL 580B
ZEROING

Once the 580B has been zeroed the 580B will display:

SPAN PPM = 0000

The Span gas concentration may now be entered by simultaneously pressing the RESET switch and either the +/INC switch to increment the digit above the cursor or the -/CRSR switch to move the cursor. Once the span gas concentration has been entered the +/INC switch should be pressed.

The 580B will then display:

SPAN GAS
RESET WHEN READY

Once the span gas has been introduced the RESET switch should be pressed. The 580B will then calibrate the instrument. The 580B will display:

MODEL 580B
CALIBRATING

Once the 580B has been calibrated the 580B will go back to the beginning and display:

"RESET" TO
CALIBRATE

If during the zeroing or calibrating of the 580B a steady reading was not seen then the 580B will display:

CAL ERROR
RESET WHEN READY

Pressing the RESET switch will return the 580B to zeroing or calibrating (depending of course on which it came from).

See Section 4.1 for tips on calibrating the 580B.

2.4.9 FREE SPACE INDICATION

This section will give a rough indication of how much room is left for logging data points. The screen will display a bar graph on the top line and the amount of free space on the bottom line. The number indicates the total number of bytes which are available. Each data point takes fifteen bytes. Other bytes may also be needed in order to store other important information. This is why only a rough indication of room may be given.

2.5 ACCESS MODE

The Access mode is entered by pressing the +/INC switch from the main menu. The 580B has four access levels, zero through three. Level zero will only allow the operator to log data points and of course to change access levels (only if the access code is known). Level one will also allow the user to change the user identification number. Level two will allow the user complete access to the Parameters mode, and allow viewing of the date and time. Access level three allows complete access.

The access mode has three sections:

1. Access level
2. User identification number
3. Instrument number

Pressing the +/INC switch will advance the 580B to the next section. Pressing the -/CRSR switch will advance the 580B to the previous section.

TABLE OF ACCESS LEVELS

ACCESS LEVEL	OPERATIONS ALLOWED
0	Change access level Log data
1	All above operations View time and date View communication format Display logged data Change user I.D.
2	All above operations Change operating Parameters Reset logged data
3	All operations available

2.5.1 ACCESS LEVEL

The screen will display:

```
ACCESS LEVEL   3
"RESET" TO CHG
```

By pressing the RESET switch the 580B will display:

```
    KEY    00003
"RESET" WHEN DONE
```

Please note that in both screens the 3 indicates the current access level and may not necessarily be a three.

In order to change the access level the +/INC switch may be pressed to increment the digit above the cursor and the -/CRSR switch may be pressed to move the cursor. The desired access level should be entered in the right most digit. Note that only access levels between zero and three are legal. The remaining four digits are the access code. The access code will be 0000 when the instrument is shipped. The access code should then be entered. Once this is done press the RESET switch. The 580B will then return to the previous screen.

If the access code entered was not the proper access code, or if the access level was not a legal access level then the access level will not be changed.

The last and most important point regarding the access level is how to change the access code. The access code is the four rightmost digits of the instrument number. The instrument number is only viewable (and therefore only changeable) while in access level three.

2.5.2 USER IDENTIFICATION NUMBER

The screen will display:

```
I.D.# 014563977
"RESET" TO CHG
```

By pressing the RESET switch the 580B will display:

```
I.D.# 014563977
"RESET" WHEN DONE
```

The user identification number may be changed by pressing the +/INC switch to increment the digit above the cursor and the -/CRSR switch to move the cursor. The user identification number is a nine digit number (just right for fitting a social security number). Once the user identification number has been entered press the RESET switch and the 580B will return to the previous screen.

2.5.3 INSTRUMENT NUMBER

The screen will display:

```
INSTR #  000000
"RESET" TO CHG
```

By pressing the RESET switch the 580B will display:

```
INSTR #  000000
"RESET" WHEN DONE
```

The instrument number may be changed by pressing the +/INC switch to increment the digit above the cursor and the -/CRSR switch to move the cursor. Once the instrument number has been entered the RESET switch should be pressed. The 580B will then display the previous screen.

When the instrument number is changed it is very important that the last four digits be remembered. These digits are the access code and therefore will need to be known in order to change the access level.

2.6 CLOCK MODE

The Clock mode is entered from the Main menu by pressing the SPKR switch. The screen will display the date and time on the top line. The bottom line will display:

"RESET" TO CHG

By pressing the RESET switch the 580B will display:

"RESET" WHEN DONE

The date and time may be changed by pressing the +/INC switch to increment the number (or in the case of the month the months abbreviation) above the cursor. The -/CRSR switch will move the cursor. Once the proper month has been entered the RESET switch should be pressed. The 580B will return to the previous screen.

The date and time will be maintained even when the instrument is turned off! It is however advisable that the date and time periodically be checked to ensure that it is correct.

2.7 COMMUNICATION MODE

The Communication mode is entered from the main menu by pressing the RESET switch. The Communications mode has four sections.

1. Communicate with printer or computer
2. Display logged data
3. Reset logged data
4. Set communication parameters

Pressing the -/CRSR switch will advance the 580B to the next section.

NOTE: A detailed discussion of communication protocol is given in Appendix A. Further discussion of communication may be found in Section Seven.

2.7.1 COMMUNICATE WITH PRINTER OR COMPUTER

The 580B is capable of communicating with a computer or outputting logged data to a printer. The 580B will display:

COMMUNICATE?

"+" = YES

if the computer format is selected or it will display:

OUTPUT TO PRINTER
"+" = YES

if the printer format is selected. In either case pressing the +/INC switch will cause the 580B to try to establish communication. Pressing the -/CRSR switch instead will cause the 580B to advance to the next section.

2.7.2 DISPLAY LOGGED DATA

If at least one data point has been logged the 580B will displ

DISP. LOG DATA?
"+" = YES

By pressing the +/INC switch the 580B will display the first data point. The date and time which the data point was logged will be displayed on the top line. The bottom line will alternate between the location code and the PPM. Pressing the +/INC switch will advance to the next logged data point. This will continue until there are no more data points at which time the 580B will display:

NO DATA STORED

The MODE/STORE switch may be pressed to return to the Run mode.

2.7.3 RESET LOGGED DATA

The logged data can be erased so that more data points may be logged. The screen will display:

RESET LOG DATA?
"+" = YES

Pressing the +/INC switch will erase all of the logged data points. The 580B will then advance to the next section.

2.7.4 COMMUNICATIONS PARAMETERS

The 580B can be configured to communicate with a printer or a computer. The baud rate may also be set for 9600, 4800, 2400, 1200, 900, 600, 300, or 150 baud. The 580B will display the current communication format (computer or printer) on the top line and the current baud rate on the bottom line. Pressing the RESET switch will cause the 580B to display:

COMPUTER FORMAT
+ = USE - = NO

Pressing the +/INC switch will select the computer format and the 580B will advance to the baud rate screen (see below). Pressing the -/CRSR switch will cause the 580B to display:

PRINTER FORMAT
+ = USE - = NO

Pressing the +/INC switch will select the printer format and the 580B will advance to the baud rate screen (see below). Pressing the -/CRSR switch will cause the 580B to display the previous screen.

The baud rate screen will display the currently selected baud rate on the top line. The bottom line will display:

+ = USE - = NO

Pressing the +/INC switch will cause the displayed baud rate to be selected and the 580B to show the selected format on the top line and the baud rate on the bottom line. Pressing the -/CRSR switch instead will cause the next lowest baud rate to be displayed.

2.8 BATTERY / CHARGER

The model 580B uses a 1.2 amp hour lead acid (gel cell) battery. There is protection circuitry potted directly on top of the battery. The battery is rechargeable with the charger provided with the instrument. The charger is regulated so that there is no danger of "over charging" the battery. It is suggested that the 580B be charged over the weekend (as well as each evening) during periods of heavy usage in order to ensure maximum battery charge.

SECTION III

ROUTINE MAINTENANCE

The routine maintenance of the 580B involves the calibration of the instrument, the cleaning of the lamp window, and the maintaining of charge on the battery. The following pages give instructions for routine maintenance. Figure 3.1 illustrates the detector assembly.

3.1 LAMP INSERTION AND REMOVAL

3.1.1 REMOVAL

NOTE: The 580B must be off while removing the lamp.

In order to remove the lamp the four screws which hold the case top and bottom together must first be loosened. The case bottom should be placed flat on the table and the top placed on its side next to the bottom.

The high voltage power supply is removed next by loosening the thumb screws on each side and then pulling the power supply towards the rear of the instrument (see figure 3.1). The lamp may now be removed by loosening the lamp nut.

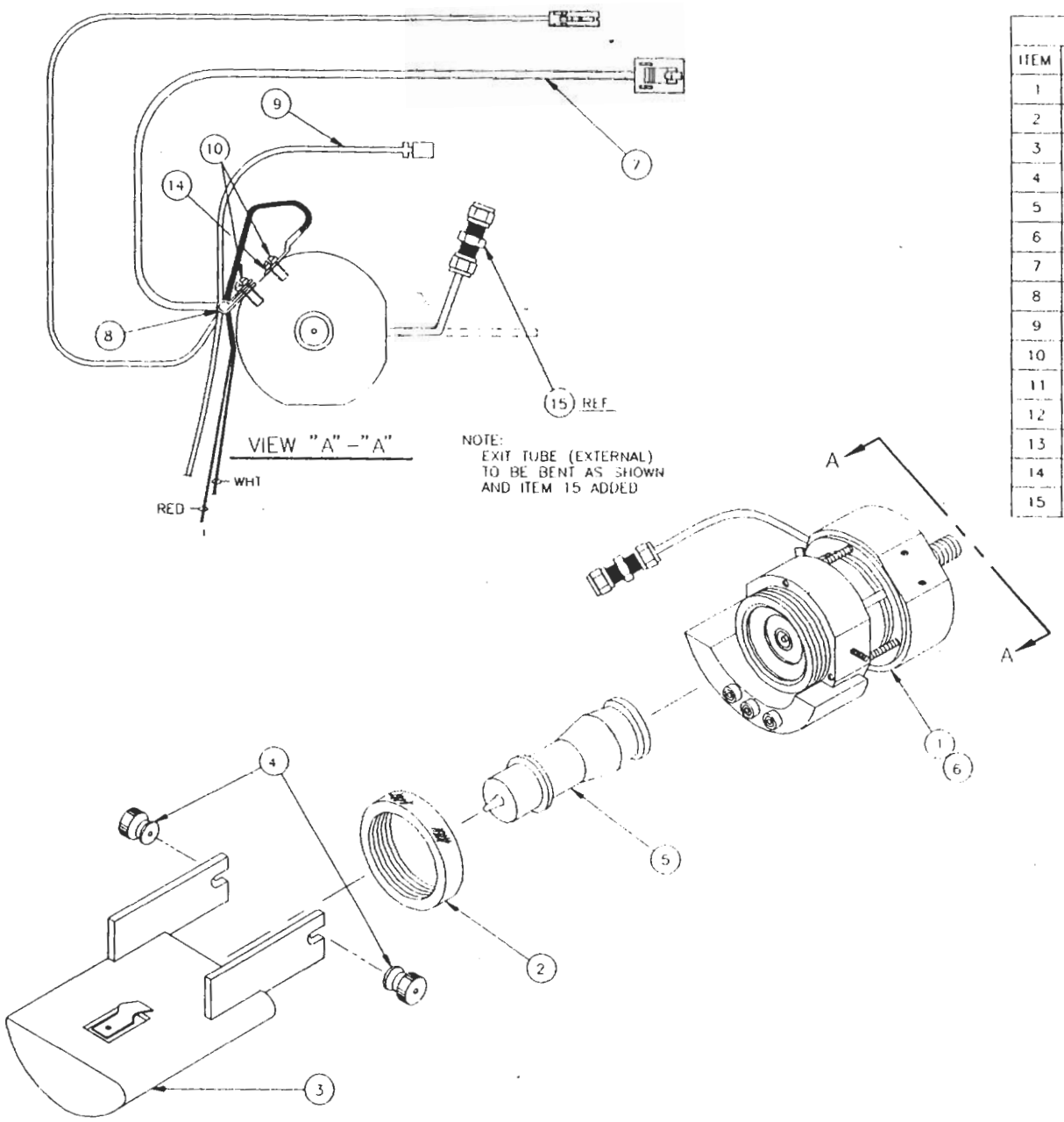
3.1.2 INSERTION

Insertion of the lamp is accomplished by performing the above tasks in the reverse order. The lamp should be placed flat against the o-ring and the lamp nut fastened down in order to create a proper seal. The high voltage power supply should then be inserted and the thumb screws fastened down. There are three pins protruding from the high voltage power supply which should fit snugly into connectors located beneath the detector. The lamp spring (mounted in the center of the high voltage power supply) should make contact with the lamp ring.

3.1.3 LAMP CLEANING

On occasion the lamp should be removed for cleaning. Cleaning of the lamp is accomplished by cleaning the lens surface of the UV lamp. This is accomplished by using the aluminum oxide scouring powder provided with the 580B.

The procedure for cleaning the lamp is as follows. First place a small amount of aluminum oxide scouring powder on the lens of the UV lamp. Next gently scour this lens with a soft tissue or cloth. Scour the lens in a rotary type motion. After scouring the lens surface, gently blow the remaining powder from the lens. Thoroughly wipe the lamp lens with a clean tissue to remove the last traces of cleaning powder. The lamp is now able to be inserted into the detector.



MATERIAL LIST			
ITEM	PART NO.	DESCRIPTION	QTY
1	580B-6003	DETECTOR SUB ASSY.	1
2	580S-2010	NUT - LAMP (13507)	1
3	580S-6019	PWR SUPPLY ASSY. (13560)	1
4	12082	NUT - KNURLED	2
5	11929	U.V. LAMP 10.0	1
6	580S-6035	DETECTOR WIRING ASSY. (13575)	1
7	580B-6001	BASE HARNESS ASSY.	1
8	4166	STRAIN RELIEF	1
9	580S-6028	SIGNAL CABLE (13568)	1
10	5814	#4-40 X 1/4" BINDER HD. SCREW	2
11			
12			
13	5510	TEFLON TUBING 1/8" 6.5" LG.	1
14	5588	#4 INT. TOOTH STAR WASHER	1
15	4417	UNION-2U-316	1

Figure 3.1
Detector Assembly

3.2 CALIBRATION

NOTE: Chapter four should be read before calibrating the 580B in order to gain a better understanding of the concepts behind calibration of the 580B.

The following is a brief discussion of calibration as it relates to different lamps. One of the parameters in the Parameters mode (see Section 2.4) allows selection of lamp setting. The two types of lamps are the 10.0 eV and the 11.8 eV lamp. Whenever a new lamp is used the 580B must be calibrated. This is true even if the new lamp is the same type, e.g., the new and old lamp are both 10.0 eV. This is due to the fact that each lamp will have a slightly different sensitivity.

It is important to note that the 11.8 eV lamp will in general be less sensitive than the 10.0 eV lamp. This is true despite the higher energy level of the 11.8 eV lamp. The 11.8 eV lamp will however "see" certain gases which the 10.0 eV lamp will not. See Table E.1 for a list of common organic vapors and their associated ionization potentials. Any questions regarding the use of the 580B should be directed to Thermo Environmental's Application Laboratory.

The 580B is quite simple to calibrate. A source of "zero air" and "span gas" are all that is needed to calibrate the 580B. The zero air is introduced to the 580B in order to determine the "background" signal. The concentration of the span gas is then selected. The span gas is finally introduced to the 580B. The instrument makes all of the necessary calculations (including linearization) to arrive at a "calibration constant." When in the Run mode the signal is multiplied by the calibration constant in order to arrive at the current PPM.

$$\text{CALIBRATION CONSTANT} = \frac{\text{SPAN PPM}}{\text{SPAN SIGNAL} - \text{ZERO SIGNAL}}$$

$$\text{PPM} = (\text{SPAN SIGNAL} - \text{ZERO SIGNAL})\ \text{CALIBRATION CONSTANT}$$

NOTE: The PPM is then multiplied by the RESPONSE FACTOR before being displayed. Chapter four explains the use of response factors when calibrating.

Section 2.4.8 gives a detailed explanation of which buttons to press in order to calibrate the 580B. The flow chart at the back of this manual may also be helpful.

3.3 CHARGE

When there is a flashing "B" in the lower left corner of the display (while in the run mode) the battery is low. The battery is recharged by plugging the charger into the RUN/CHARGE plug at the rear of the 580B. The instrument runs while it is charging.

SECTION IV

CALIBRATION

4.1 GENERAL

The Model 580B Organic Vapor Meter is indeed a quantitative instrument and can certainly be used as such. It makes use of the Photoionization Detection System using a lamp with an ionization energy of 10.0 eV which is standard in the Model 580B. Almost all organic materials will be ionized at this energy level. There are some organic materials, such as a few of the freons, methane, ethane and propane that are not ionized and thus will not be detected. The ionization potentials for the various organic materials will simply tell whether the material will be detected by the Photoionization Detector. It does not give any clue as to the sensitivity of the detector for that particular material. Certainly, different organic vapors will have different sensitivities. It is important to understand that the Model 580B does indeed sense most organic vapors and that its response to these different organic vapors will be different.

In this section of the manual, the aspects of calibrating the Model 580B for various vapors will be discussed. In the following section discussing applications, various ways of using the features of the Model 580B will be explained along with the various methods for calibration of the 580B. There will also be applications of the Model 580B in specific instances where the organic vapors or the mixtures of organic vapors are completely unknown. The 580B can be an extremely useful tool, even in areas such as those.

4.2 FACTORY CALIBRATION TEST OF THE MODEL 580B

The Model 580B has been tested for calibration and linearity tested at the factory. The particular gas chosen for this calibration is isobutylene. The Model 580B has good response for isobutylene. Isobutylene standards prepared in air are relatively stable with time, undergoing no serious adsorption or reaction problems. The test information is included in the instrument packet. In addition to the above test a benzene standard is also run. It is important to note that the instrument was not calibrated. It was tested for calibration. Therefore, it should be calibrated by the operator before use.

4.3 METHODS OF GENERATING CONCENTRATIONS OF VARIOUS MATERIALS IN AIR

This section is not intended to be all inclusive as far as the preparation of gas and vapor standards in air are concerned. Only those methods that have been found most practical for the calibration of the 580B are discussed here. There are basically two types of standards, cylinder and bag.

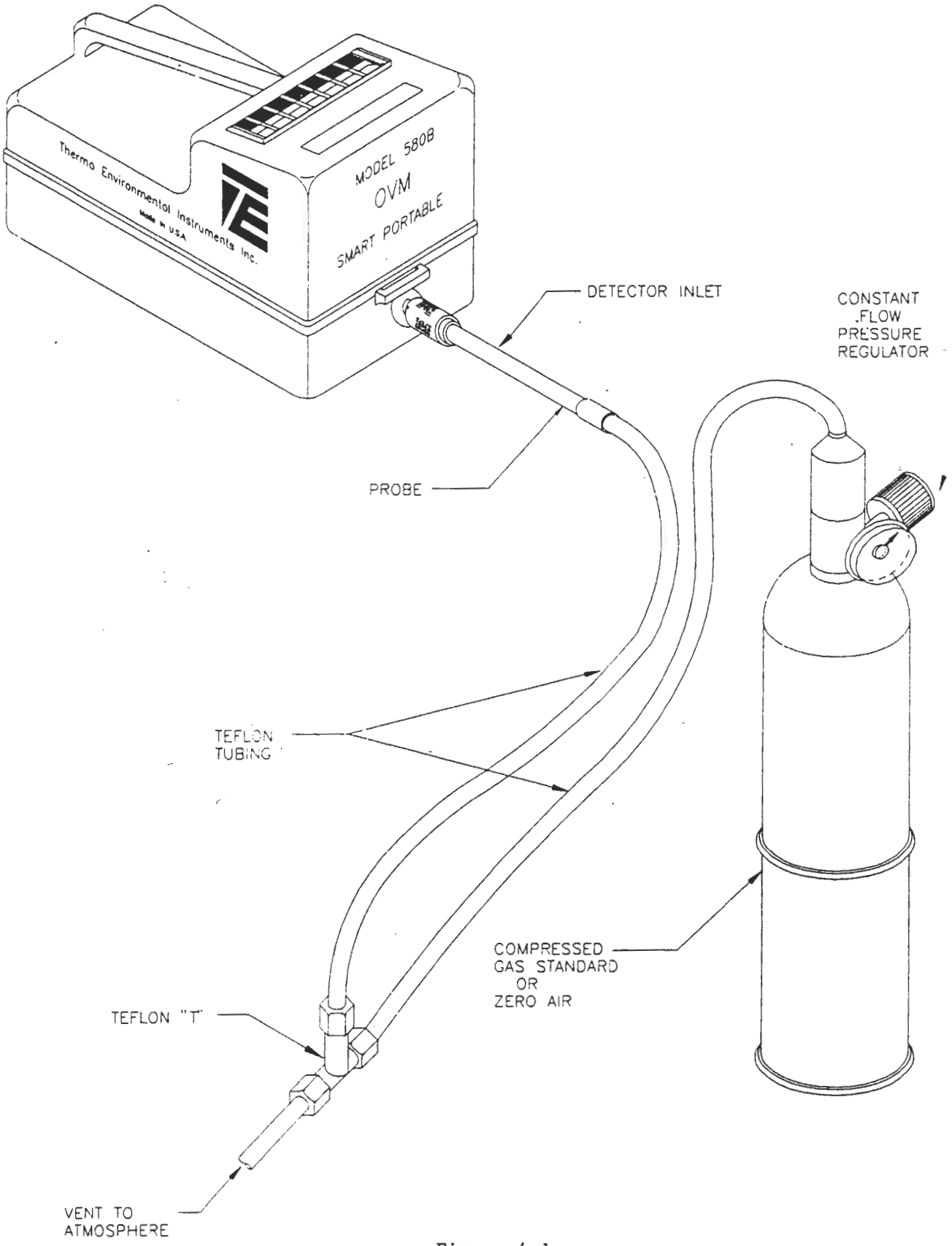


Figure 4.1
Cylinder Calibration

4.3.1 CYLINDER STANDARDS

Certainly commercially available standard cylinders of gaseous materials in air offer the most convenient method of calibration. However, these are static standards. Standards prepared in this fashion in air for vapors of various organic liquids often show concentration reduction with time due to adsorption problems. In general, gases when mixed with air will maintain their concentrations with time since adsorption is generally not a problem.

However, some gases are sufficiently reactive that chemical reaction of the gas will cause a reduction of it in air. These precautions must be observed when using commercially prepared standards for calibration of the Model 580B. It is for this reason that isobutylene in air was chosen as a reference standard for factory calibration. TEI offers a cylinder standard which includes both zero and isobutylene standards. A constant flow pressure regulator sets the flow needed for calibration of the 580B. Figure 4.1 illustrates the physical calibration procedure. The inlet to the 580B is connected to the "T" as shown. It is important that this connection is tangent to the gas flow. The "T" is connected to the regulator on the standard cylinder. It is important that a length of tubing is attached to the "T" location. This prevents diffusion of ambient air into sample line. The regulator and tubing assembly will have to be moved between both the zero air and standard cylinder.

4.3.2 BAG STANDARDS (ISOBUTYLENE)

Bag standards can be prepared in a laboratory and in general are reasonable ways of calibrating the Model 580B. However, it is important that these standards be used shortly after their preparation to reduce the significance of any adsorption problems. Static standards prepared for calibration of the Model 580B are best prepared in collapsible plastic bags. This is opposed to a fixed volume container. The sampling rate of the 580B, which is 500 ml/min, requires an appreciable amount of sample. Even one minute's sampling out of a fixed container will remove 500 ml/min from it. This should not significantly reduce the pressure inside the container. Thus, the collapsible bag provides the best means as opposed to a fixed volume. A 5 gallon polyethylene bag is a convenient size to use for the preparation of static standard.

A tube is inserted into the opened end of the bag and the bag opening then sealed around the tube. The tube should have a cutoff valve or some means of closing the volume of the bag. The volume of air introduced into the bag must be measured. This is most conveniently measured by a wet test meter. However, a source of air flowing through a flow meter can be used if the flow can be held constant, then time is a measure of the volume of the air placed into the bag. All air is expelled from the bag by completely collapsing it prior to connection to the source of air.

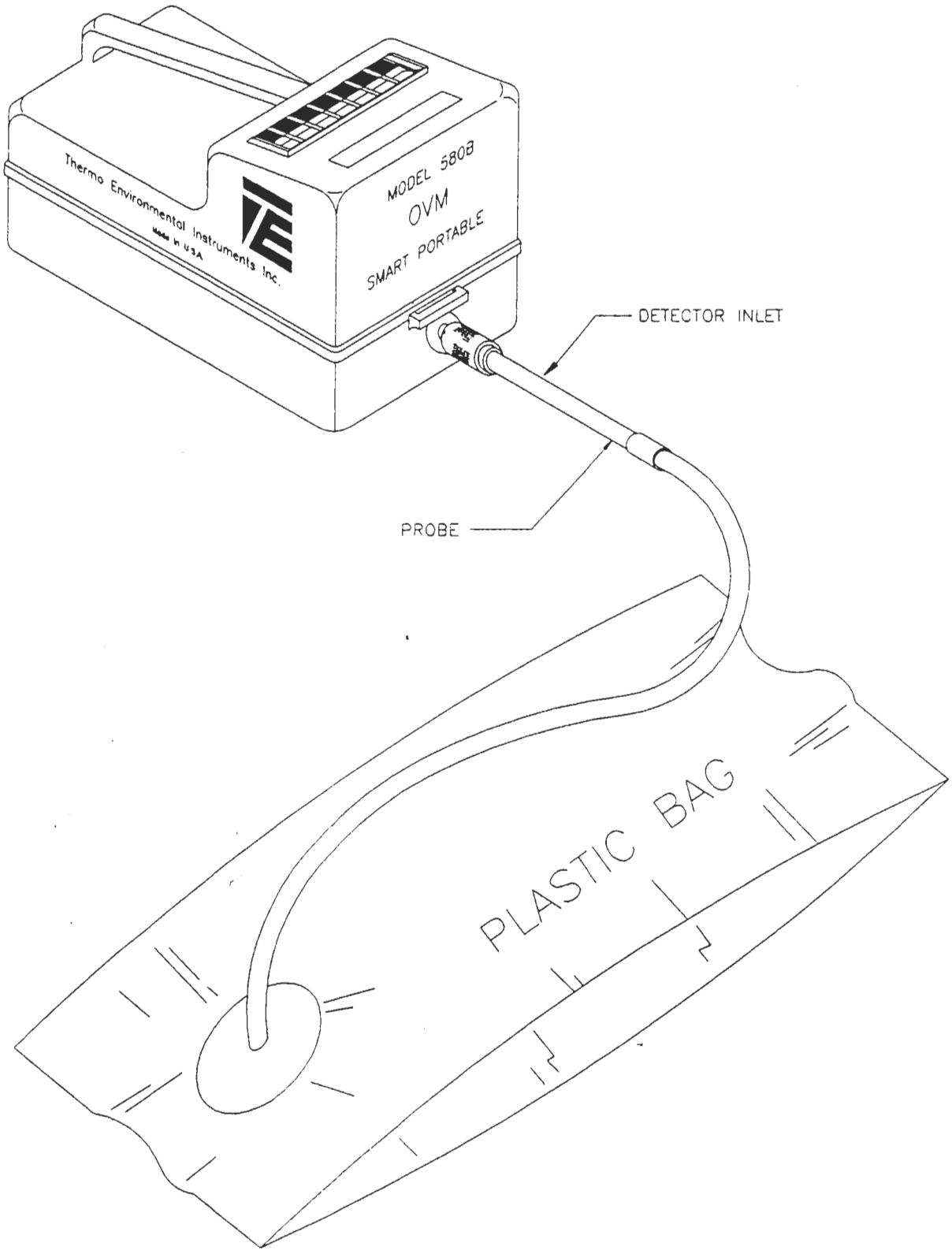


Figure 4.2
Bag Calibration

It can then be connected to a wet test meter or flow meter via a short length of rubber tubing hooked to the plastic tube of the bag. The air flow is started into the bag at a rate of approximately 5L/min. A total of 10 liters is a convenient volume for a 5 gallon bag. This would mean approximately 2 minutes for filling the bag. Figure 4.2 illustrates the physical configuration needed to develop bag standards.

For gaseous samples, the trace organic will be added via a glass hypodermic syringe. The 1 cc Tuberculin syringe is a convenient size. For an isobutylene standard, the 1 cc syringe is flushed with pure isobutylene and then filled to the 1cc mark. While the air is flowing into the plastic bag, the short piece of rubber tubing is pierced by the needle from the 1 cc syringe and the plunger slowly depressed such that the 1 cc of isobutylene is added to the air flowing into the plastic bag. When 10 liters of air have been added to the plastic bag, the flow is immediately stopped and the valve on the tube or the closing clamp is applied to contain the air and isobutylene within the plastic bag. It is best at this stage of the procedure not to rely solely on the diffusion of isobutylene to form a uniform mixture inside the plastic bag. Slight kneading of the plastic bag will hasten the mixing of the isobutylene in air. The plastic tube from the bag is then connected to the probe on the Model 580B via a short length of rubber tubing and the valve on the plastic tube immediately opened. The Model 580B withdraws a sample from the bag at the sampling rate of 500 ml/min. Thus, 10 liters of sample in the bag will provide approximately 20 minutes. Certainly the calibration of the 580B can be accomplished in a shorter period of time. The concentration of isobutylene in ppm by volume will be equal to the sample size, which was 1 cc, divided by the volume of the bag in liters, which would be 10 liters, times 1000. In this particular instance, the concentration would be:

$$\text{Conc (ppm by Vol)} = \frac{\text{1cc Isobutylene} \times 1000}{\text{10 L Air}} = 100 \text{ ppm}$$

4.3.3 BAG STANDARDS (ORGANICS)

On occasion there is the need to prepare standards other than the normal calibration standard. As mentioned previously, isobutylene was chosen as a standard because of its stability. If other standards are to be used, it is best to develop a relation of the other standard to a standard of known stability like isobutylene. If this procedure is followed, a response factor can be developed by comparing the other organic standard to isobutylene this technique will be discussed in a later section. The following is a suggested technique for preparing other standards.

For organic materials, which are normally liquids at room temperature, the procedure is essentially the same except that an extremely small liquid sample is injected into the flowing air stream rather than the gas sample. This technique works well

only for relatively volatile organic materials. The flowing air stream must vaporize all of the material or the calculation will be off. If the material is not rapidly volatile in that flowing air stream, the liquid should be injected through the surface of the plastic bag. Immediately after withdrawing the needle, the hole in the plastic bag should be covered with a piece of plastic tape.

Again, significant kneading of the bag will hasten the evaporation of the sample and mixing of the vapor into the air to provide homogeneous samples. The introduction of this sample into the 580B is the same as before. The calculation of the concentration of the vapor in air is a two-step procedure whereby the small volume of liquid injected into the air stream and into the plastic bag is converted to a volume of vapor. This volume of vapor is then used in the same manner as the volume of gas in the case of isobutylene. The following equations apply:

$$\text{Volume Vapor (uL)} = \frac{\text{Liquid Volume (ul)} \times \text{Liquid Density} \times 24.45}{\text{Molecular Weight}}$$

The above equation gives the vapor volume at atmospheric pressure (760 torr) and 25° C (77F).

Then:

$$\text{Concentration (ppm by Volume)} = \frac{\text{Vapor Volume (ul)} \times 1000}{\text{Air Volume (liters)}}$$

The following is a sample calculation for benzene:

Liquid Volume = 2 ul

Benzene Density = 0.879 g/cc

Molecular Weight Benzene = 78.1

Air Volume = 10 Liters

$$\text{Vapor Volume} = \frac{2 \times 0.879 \times 24.45 = 0.55 \text{ ul}}{78.1} \quad \text{Benzene Vapor}$$

$$\text{Conc} = \frac{0.55 \times 1000}{10} = 55 \text{ ppm (vol)}$$

The syringe used for the measurement of liquids in this particular instance is a small volume-type such as those manufactured by the Hamilton Company. A convenient size syringe is the 10 microliter volume.

Appendix 6

NYSDEC Laboratory Analytical Report for Groundwater Samples

Collected from Monitoring Wells

Sampling Date: June 27, 2002

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATON
LABORATORY ANALYTICAL REPORT

ELAP LABORATORY ID NUMBER: 11625
EPA LABORATORY ID NUMBER: NY01358

VOLATILE ORGANICS ANALYSIS DATA SHEET

FIELD SAMPLE ID: **TRIP BLANK**

Site Name: 123 POST
Site Code: 130088 Date Collected: 6/27/02 SDG No.: 179-01

Matrix: (soil/water) WATER Date Received: 06/28/02 Lab Sample ID: 102-179-04
Sample wt/vol: 5.0 (g/ml) ML Lab File ID: 02C0761.D
GC Column: ZB-624 ID: 0.25 (mm) Date Analyzed: 07/01/02
% Moisture: decanted:(Y/N) N Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon Disulfide	10	U
67-64-1	Acetone	10	U
75-09-2	Methylene Chloride	10	U
1634-04-4	methyl-tert butyl ether	10	U
540-59-0	trans 1,2-Dichloroethene	10	U
75-34-4	1,1-Dichloroethane	10	U
108-05-4	Vinyl acetate	10	U
540-59-0	cis 1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropen	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	m,p-Xylenes	10	U
1330-20-7	o-Xylene	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
95-49-8	2-Chlorotoluene	10	U
106-43-4	4-Chlorotoluene	10	U
541-73-1	1,3-Dichlorobenzene	10	U

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD SAMPLE ID: **TRIP BLANK**

Site Name: 123 POST
Site Code: 130088
SDG No.: 179-01
Matrix: (soil/water) WATER
Lab Sample ID: 102-179-04
Sample wt/vol: 5.0 (g/ml) ML
Lab File ID: 02C0761.D
Level: (low/med) LOW
Date Received: 06/28/02
% Moisture: not dec.
Date Analyzed: 07/01/02
GC Column: ZB-624 ID: 0.25 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATON
LABORATORY ANALYTICAL REPORT

ELAP LABORATORY ID NUMBER: 11625
EPA LABORATORY ID NUMBER: NY01358

VOLATILE ORGANICS ANALYSIS DATA SHEET

FIELD SAMPLE ID: **MW-1**

Site Name: 123 POST
Site Code: 130088 Date Collected: 6/27/02 SDG No.: 179-01
Matrix: (soil/water) WATER Date Received: 06/28/02 Lab Sample ID: 102-179-01
Sample wt/vol: 5.0 (g/ml) ML Lab File ID: 02C0762.D
GC Column: ZB-624 ID: 0.25 (mm) Date Analyzed: 07/01/02
% Moisture: decanted:(Y/N) N Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon Disulfide	10	U
67-64-1	Acetone	10	U
75-09-2	Methylene Chloride	10	U
1634-04-4	methyl-tert butyl ether	10	U
540-59-0	trans 1,2-Dichloroethene	10	U
75-34-4	1,1-Dichloroethane	10	U
108-05-4	Vinyl acetate	10	U
540-59-0	cis 1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropen	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	8	J
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	m,p-Xylenes	10	U
1330-20-7	o-Xylene	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
95-49-8	2-Chlorotoluene	10	U
106-43-4	4-Chlorotoluene	10	U
541-73-1	1,3-Dichlorobenzene	10	U

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

FORM I VOA

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD SAMPLE ID: MW-1

Site Name: 123 POST
Site Code: 130088
SDG No.: 179-01
Matrix: (soil/water) WATER
Lab Sample ID: 102-179-01
Sample wt/vol: 5.0 (g/ml) ML
Lab File ID: 02C0762.D
Level: (low/med) LOW
Date Received: 06/28/02
% Moisture: not dec.
Date Analyzed: 07/01/02
GC Column: ZB-624 ID: 0.25 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATON
LABORATORY ANALYTICAL REPORT

ELAP LABORATORY ID NUMBER: 11625
EPA LABORATORY ID NUMBER: NY01358

VOLATILE ORGANICS ANALYSIS DATA SHEET

FIELD SAMPLE ID: **MW-2**

Site Name: 123 POST
Site Code: 130088 Date Collected: 6/27/02 SDG No.: 179-01

Matrix: (soil/water) WATER Date Received: 06/28/02 Lab Sample ID: 102-179-02
Sample wt/vol: 5.0 (g/ml) ML Lab File ID: 02C0763.D
GC Column: ZB-624 ID: 0.25 (mm) Date Analyzed: 07/01/02
% Moisture: decanted:(Y/N) N Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon Disulfide	10	U
67-64-1	Acetone	10	U
75-09-2	Methylene Chloride	10	U
1634-04-4	methyl-tert butyl ether	10	U
540-59-0	trans 1,2-Dichloroethene	10	U
75-34-4	1,1-Dichloroethane	10	U
108-05-4	Vinyl acetate	10	U
540-59-0	cis 1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropen	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	7	J
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	m,p-Xylenes	10	U
1330-20-7	o-Xylene	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
95-49-8	2-Chlorotoluene	10	U
106-43-4	4-Chlorotoluene	10	U
541-73-1	1,3-Dichlorobenzene	10	U

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

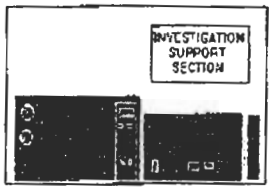
FIELD SAMPLE ID: **MW-2**

Site Name: 123 POST
Site Code: 130088
SDG No.: 179-01
Matrix: (soil/water) WATER
Lab Sample ID: 102-179-02
Sample wt/vol: 5.0 (g/ml) ML
Lab File ID: 02C0763.D
Level: (low/med) LOW
Date Received: 06/28/02
% Moisture: not dec.
Date Analyzed: 07/01/02
GC Column: ZB-624 ID: 0.25 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 4

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000473-91-6	Cyclopentene, 1,2,3-trimethyl-	19.22	3	JN
2. 001758-88-9	Benzene, 2-ethyl-1,4-dimethyl-	25.43	3	JN
3. 000767-58-8	Indan, 1-methyl-	25.69	6	JN
4. 000824-22-6	1H-Indene, 2,3-dihydro-4-methyl-	26.88	4	JN



NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATON
LABORATORY ANALYTICAL REPORT

ELAP LABORATORY ID NUMBER: 11625
EPA LABORATORY ID NUMBER: NY01358

VOLATILE ORGANICS ANALYSIS DATA SHEET

FIELD SAMPLE ID: **MW-3**

Site Name: 123 POST
Site Code: 130088 Date Collected: 6/27/02 SDG No.: 179-01
Matrix: (soil/water) WATER Date Received: 06/28/02 Lab Sample ID: 102-179-03
Sample wt/vol: 5.0 (g/ml) ML Lab File ID: 02C0764.D
GC Column: ZB-624 ID: 0.25 (mm) Date Analyzed: 07/01/02
% Moisture: decanted:(Y/N) N Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon Disulfide	10	U
67-64-1	Acetone	10	U
75-09-2	Methylene Chloride	10	U
1634-04-4	methyl-tert butyl ether	10	U
540-59-0	trans 1,2-Dichloroethene	10	U
75-34-4	1,1-Dichloroethane	10	U
108-05-4	Vinyl acetate	10	U
540-59-0	cis 1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropen	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	4	J
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	m,p-Xylenes	10	U
1330-20-7	o-Xylene	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
95-49-8	2-Chlorotoluene	10	U
106-43-4	4-Chlorotoluene	10	U
541-73-1	1,3-Dichlorobenzene	10	U

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD SAMPLE ID: **MW-3**

Site Name: 123 POST
Site Code: 130088
SDG No.: 179-01
Matrix: (soil/water) WATER
Lab Sample ID: 102-179-03
Sample wt/vol: 5.0 (g/ml) ML
Lab File ID: 02C0764.D
Level: (low/med) LOW
Date Received: 06/28/02
% Moisture: not dec.
Date Analyzed: 07/01/02
GC Column: ZB-624 ID: 0.25 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q