FORMER CHEZ VALET DRY CLEANERS

NASSAU, NEW YORK

Site Management Plan

NYSDEC Site Number: 1-30-169

Prepared for:
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c/o 1-3 Manorhaven Blvd., LLC
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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

JULY 13, 2017

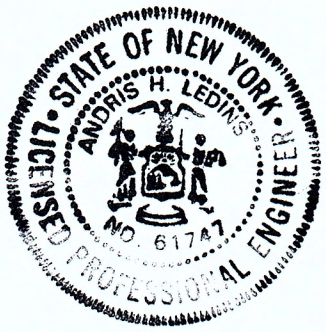
I, Andris H. Ledins certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Andris H. Ledins

Andris H. Ledins, P.E.

7/13/17

Date



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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

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This document is required as an element of the remedial program at Former Chez Valet Dry Cleaners (hereinafter referred to as the "Site") under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The site is presently being remediated in accordance with Order on Consent Index # CO 1-20160511-47, Site #130169 which was executed on June 1, 2016 and in accordance with the "Interim Remedial Measures" presented in a report entitled "INTERIM REMEDIAL MEASURE, REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT", prepared by Advanced Cleanup Technologies, Incorporated (ACT) Environmental Consultants dated February 25th, 2011

1.1.1 General

The previous Owner entered into an Order on Consent with the NYSDEC to remediate a 0.30 acre property located in the Village of Manorhaven, Nassau County, New York. The Order on Consent requires the Remedial Party, 1-3 Manorhaven Boulevard, LLC, to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of this 0.30-acre "site" is provided in Figure #1. The boundaries of the site are more fully described in the metes and bounds site description will become part of the Environmental Easement. Please refer to Attachment 1 –Form of Environmental Easement.

After completion of the 2007 Interim Remedial Measure (IRM) which removed drums, stored chemicals and an aboveground storage tank, further investigations revealed that some contamination remained in the subsurface at this site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by Andris H. Ledins, P.E. on behalf of 1-3 Manorhaven Boulevard, LLC in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

The site contains contamination left after completion of the IRM. A sub slab depressurization/soil vapor extraction system which commenced operation February 7, 2011. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement has been executed by the NYSDEC, and recorded with the Nassau County Clerk. The Approved Environmental Easement requires compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Interim Remedial Action, including: (1) implementation and management of all Engineering and Institutional

Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems.

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index # CO1-20160511-47; Site #1-30-169) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the Village of Manorhaven County of Nassau, New York and is identified as Section 4; Block 74 and Lots 1, 2, 3, 4 and 5 on the Nassau County Tax Map. The site is an approximately [0.30]-acre area bounded by a private residence (Lot 42) to the north, Manorhaven Boulevard to the south, Sands Point Road to the east, and a municipal parking lot (Lot 6) to the west (see Figure #1). The boundaries of the site are more fully described in Attachment 1 – Environmental Easement.

1.2.2 Site History

The Chez Valet Dry Cleaners site is located in a suburban area of Nassau County at 1–3 Manorhaven Blvd., Port Washington, New York.

The site consists of a one-story structure built in 1926, which covers approximately 6500 ft.^{2}. The current vacant space (North Room) of the existing structure was occupied by Chez Valet Dry Cleaners and the other spaces are currently utilized by a hair salon. A parking lot covers the remaining portions of the property. A residential property adjoins the site to the North.

The site is zoned for commercial use and can be occupied by two tenants.

It is been reported that the dry cleaner operated at the complex from the 1970s through 2006. Investigation reports from 2004, 2005, 2006 and 2011 indicated PCE was detected in the soil vapor and groundwater at or near the site.

1.2.3 Geologic and Hydrogeologic Conditions

The geology at the site consists of medium to find sand to a depth of 11 feet below ground surface. Groundwater is approximately 7 feet below ground surface (bgs) and flows to the southwest toward Manhasset Bay.

[1] *"The Site lies at an elevation of 15 feet above mean sea level on the Manhasset*

[1] Italicized paragraphs presented within this report are extracted from "INTERIM REMEDIAL MEASURE REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT – FORMER CHEZ VALET DRY CLEANERS, dated February 25,2011 – prepared by Paul P. Stewart, MS of Advanced Cleanup Technologies, Inc. (ACT) and Andris H Ledins, PE

Neck peninsula and 600 feet from Manhasset Bay. The Bay is popularly used for boating and recreational activities. The topography of the area is generally level with a slight downward slope towards the south. The ground surface in the vicinity of the Site is covered with asphalt roadways and parking lots, concrete sidewalks and landscaped lawns. The Site itself is covered with buildings, asphalt pavement and a small dirt covered alley.

The geology beneath the Site consists of unconsolidated Pleistocene and Late Cretaceous deposits from ground surface to approximately 300 feet (bgs) where crystalline metamorphic bedrock of the Hartland Formation is located. The general soil components of the subject property and its vicinity are classified as Urban Land (Ug) and Urban Land Montauk complex, 3 to 8 percent slopes (UnB), respectively. Intertidal marsh is located across Manorhaven Boulevard approximately 600 feet to the south of the Site.

Previous investigations identified soil within 8 feet of ground surface as consisting of unconsolidated fine to medium grained sand with traces of pebbles, gravel and silt. During the current investigation, soil samples collected from borings installed beneath the on-site building consisted of orange, tan and brown medium to coarse sand with pebbles from ground surface to at least 10 feet bgs.

The major aquifer systems beneath the Site are the Pleistocene age Upper Glacial and North Shore aquifers. The Upper Glacial aquifer generally consists of fine to coarse grained stratified sand and gravel, unstratified boulders, clay and till encountered at an approximate depth of 15 feet to 0 feet msl. The North Shore aquifer consists of moderately sorted stratified drift and outwash deposits located between 150 feet and 300 feet msl. The North Shore Confining Unit, consisting of a sequence of Pleistocene age clay and silt deposits separates the Upper Glacial and North Shore aquifers between 0 feet and 150 feet msl.

The regional direction of groundwater flow is estimated to follow the topographic slope to the south towards Manhasset Bay. Shallow ground water beneath the Site was found to flow in a southerly direction during previous investigations. During the current investigation, ground water ranged in depth between 7 and 9 feet bgs in monitoring wells installed in the vicinity of the Site."

A groundwater flow figure is shown in Figure # 2 - OFFSITE GROUNDWATER QUALITY. Note, this figure extracted from the previously referenced Advanced Cleanup

Technologies, Inc. (ACT) prepared report and presents groundwater data as well as water table contours.

1.3 SUMMARY OF INVESTIGATION FINDINGS

Several investigations have been performed that document environmental conditions beneath the Site and the adjacent lot to its west. The following summary of the principal findings from these investigations is intended to identify areas where additional information is necessary. Groundwater, soil and soil vapor quality determined by these investigations are depicted in Figures 3, 4 and 5, as well as previously referenced Figure 2. A Site Diagram is presented in Figure 6.

On November 29, 2004 Severn Trent Laboratories. (STL) produced a report containing the results of soil and soil vapor testing performed on the adjacent vacant lot to the west. The STL report described the collection of 3 soil and soil vapor samples from the eastern property boundary and 1 soil and soil vapor sample from the center of the vacant lot. All of the samples were analyzed for volatile organic compounds (VOCs). No VOCs were detected in any of the soil samples. However, several VOCs, including Tetrachloroethene, were detected in the four soil vapor samples. The highest concentration of Tetrachloroethene (200 $uglm^3$) was found in soil vapor sample B-3 located in the eastern portion of the vacant lot adjacent to the western boundary of the Site. There are no specific soil vapor guidance values for Tetrachloroethene in the absence of indoor air quality data. (Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. New York State Department of Health, October 2006).

A January 17. 2006 report by Berninger Environmental, Inc. (BEI) documented the collection and analysis of 3 soil vapor samples and 7 ground water samples from the adjacent lot. The BEI report described the presence of 594 $uglm^3$ of Tetrachloroethene in soil vapor sample SG-2 located in the center of the eastern boundary of the adjacent lot bordering the Site. The BEI report also documented the presence of 75 ug/l of Tetrachloroethene in ground water sample GW-2 located adjacent soil vapor sample SG-2. The standard for Tetrachloroethene in ground water is 5 ug/l (Ambient Water Quality

Standards, NYSDEC TOGS 1.1.1, June 1996). Water levels gauged from three piezometers installed on the adjacent lot were used to estimate shallow ground water flow in a southerly direction towards Manhasset Bay.

On October 30, 2006 ACT installed and sampled five temporary ground water monitoring wells around exterior portions of the Site. The two existing piezometers on the adjacent lot (PZ-1 and PZ-2) were also sampled. The ground water samples were found to contain concentrations of Tetrachloroethene ranging from 7.1 ug/l in PZ-1 to 21 ug/l in TW-05 which was collected from a temporary well installed in a sump in the partial basement. Concentrations of Tetrachloroethene were below detection limits in four of the seven temporary wells sampled.

On January 9, 2007 ACT collected soil vapor and ground water samples from four locations within the former dry cleaner. Two ambient air samples were also collected inside the front and central portions of the northern building which was occupied by the dry cleaner at the time. The ground water samples were found to contain slightly elevated concentrations of Tetrachloroethene, with the highest concentration (20 ug/l) found in temporary well TW-08 located along the southwest wall of the building. Soil vapor samples ranged from 15,000 ug/m3 to 39,800 ug/m3 of Tetrachloroethene, with minor concentrations of Trichloroethene and Chloroform also found. The highest concentration of Tetrachloroethene in soil vapor was found in sampling location SV-04 located adjacent to the former dry cleaning machine. Concentrations of Tetrachloroethene in ambient air ranged from 190 ug/m 3 (AS-02) to 353 ug/m3 (AS-O1). The guidance value for Tetrachloroethene in ambient air with elevated sub-slab vapor concentrations is 3 ug/m3 (Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, New York State Department of Health, October 2006).

On August 1, 2007, the New York State Department of Health collected indoor and outdoor air samples from four locations at and in the vicinity of the Site, including the hair salon, a residence on Ashwood Road to the west and the John Phillips Sousa Elementary School to the north. Tetrachloroethene was not detected in air inside or outside the elementary school or the neighboring residence to the west.

Tetrachloroethene was detected in air within the hair salon at a concentration of 260 uglm3. It should be noted that the air sample within the hair salon was collected before drummed wastes and the aboveground storage tank were removed from the Site.

On November 21, 2007, ACT installed four soil borings through the concrete floor in the immediate vicinity of the former dry cleaning machine. These soil borings were continuously sampled and screened in the field with a Photoionization Detector (PID) from ground surface to the water table, which was located approximately 9 feet below ground surface. Soil samples consisted of fine to medium sand with some silt, pebbles and organic material. In-field screening produced PID readings up to 8.2 ppm in SB-O1 at 4 to 5 feet below ground surface. The highest concentration of Tetrachloroethene in soil was 34 uglkg found in SB-02. The Unrestricted Use Soil Cleanup Objective for Tetrachloroethene in soil is 1,300 ug/kg (6 NYCRR Pari 375, December 14, 2006). Ground water samples collected from the water table surface ranged from 2 ug/l of Tetrachloroethene in TW-13 to 130 ug/l of Tetrachloroethene in TW-11, which was installed near the west wall of the building and down gradient of the former dry cleaning machine.

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. Generally, the RI determined that:

- Soil samples collected during the Remedial Investigation met the Unrestricted Use Soil Cleanup Objectives contained in 6 NYCRR Part 375 and CP-51.

- Tetrachloroethene in onsite and offsite groundwater exceeded its water quality standard found in NYSDEC TOGS 1.1.1. A total of 8 VOCs commonly found in petroleum products were detected in one offsite monitoring well (MW-05) located next to an active gas station and repair shop. Three of these VOCs (Benzene, n-Propylbenzene and 1,2.4.5-Tetramethylbenzene) were detected above water quality standards.

- Sub-slab soil vapor samples and indoor air samples exceeded guidance values for subslab vapor and indoor air contained in NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October, 2006).

In summary, Tetrachloroethene met SCGs for all soil samples. However, Tetrachloroethene was detected above its SCGs in ground water, soil vapor and indoor air, warranting further action. Tetrachloroethene was the only on-site contaminant detected above SCGs and presence of Tetrachloroethene in soil; groundwater, soil vapor, and indoor air are described in the following sections.

Below is a summary of site conditions when the RI was performed..

Soil

Nine subsurface soil samples were collected at the site during the RI and analyzed for volatile organic compounds at all locations and for semi-volatiles, metals, pesticides and PCBs at one location. No surface soils are present at the site. Subsurface soil samples were collected from a depth of 0.5 - 9 feet. Soil samples were collected near potential areas of concern and a source of the PCE contamination detected in the shallow groundwater was not located as soil concentrations were below SCGs for volatile organic compounds. However some localized PCE migration appears to occur beneath the slab. Table 1 and Figure 3 present a summary of the RI analytical data for soils.

Table 1 – Soil Data

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm) [a]	Frequency Exceeding Unrestricted SCG
VOCs			
Tetrachloroethene (PCE)	Not detected to 0.190	1.3	0 of 9

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375 – 6.8(a), Unrestricted Soil Cleanup Objectives.

No site-related soil contamination of concern was identified during the RI. However, based on the elevated soil vapor/sub-slab soil vapor concentrations of PCE and PCE impacts to groundwater, a source of PCE in soil is suspected beneath the building. The PCE soil contamination will be address by the Soil Vapor Extraction/Sub-Slab Depressurization (SVE/SSD) system.

Site-Related Groundwater

Groundwater samples were collected from five overburden monitoring wells and three temporary sample points and analyzed for volatile organic compounds at all locations and for semi-volatiles, metals, pesticides and PCBs at one location. The samples were collected to assess groundwater conditions on and off-site. The results indicate that contamination in shallow groundwater exceeds the SCGs for only volatile organic compounds. Contaminant levels in the deeper groundwater did not exceed the guidance values for volatile organic compounds. Table 2 and Figures 2 and 4 present a summary of RI analytical data for groundwater.

Table 2 – Groundwater Data

Detected Constituents	Concentration Range Detected (ppb)[a]	Unrestricted SCG[b] (ppb) [a]	Frequency Exceeding Unrestricted SCG
Tetrachloroethene (PCE)	Not detected to 68	5	5 of 8

a - ppb: parts per billion, which is equivalent to micrograms per kilogram, ug/l in water;

b - SCG: Standard Criteria or Guidance – Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6NYCRR Part 703), Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYC RR Part 5).

The primary groundwater contaminant is tetrachloroethene (PCE) associated with operation of the former dry cleaner. PCE was detected above SCGs in the shallow groundwater at the site (concentration up to 68 ppb) and extends approximately 180 feet down-gradient of the site (concentration of 35 ppb). A petroleum compound, identified as benzene, was also found in the shallow groundwater in a side gradient monitoring well at a concentration of 1 ppb, which is above the groundwater standard of 0.7 ppb, and appears to originate from the gas station located to the southeast of the site. Therefore, the petroleum compounds found in groundwater are not considered site specific contaminants of concern.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in minimal contamination of groundwater. The SVE/SSD system will remove any PCE soil contamination that may be contributing to the groundwater contamination. Therefore, no active groundwater remedy is required.

Site-Related Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures and indoor air inside structures. At this site due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether actions are needed to address exposures related to soil vapor intrusion.

In 2009 five sub-slab soil vapor, two indoor air and one outdoor air samples were collected from on-site. An adjacent residence was evaluated by collecting crawl space air and indoor air samples at the same time. The results indicate tetrachloroethene (PCE) and trichloroethylene (TCE) were detected on-site and off-site. Detected concentrations were within typical background levels so no actions to address exposures related to soil vapor intrusion were needed for the off-site residence. On-site sample results indicated the need for actions to address exposures. Prior to the Remedial Investigation the New York State Department of Health sampled the indoor air and the crawl spaces within the public school and one additional off-site structure and did not detect site contamination. TCE is a known breakdown product of PCE. Table 3 and Figure 5 present a summary of RI analytical data for indoor air and sub-slab soil vapor.

Table 3 – Soil Vapor Intrusion Sampling

Detected Constituents	Indoor Air Concentration Range Detected (ug/m^3)[a]	Sub slab vapor concentration Range detected (ug/m^3)[a]	Crawl Space Air Concentration Detected (ug/m^3)[a]	Outdoor air concentration Range detected (ug/m^3)[a]
VOCs				
Tetrachloroethene (PCE)	1.63 to 4.95	46.1 to 13,700	Not Detected	Not Detected
Trichloroethene (TCE)	Not detected to 1.45	Not Detected to 12.5	1.34	Not Detected

a – ug/m^3: which is equivalent to micrograms per cubic meter.

Underground Storage Tanks

[2] A Phase I report prepared by ACT states that according to previous owners, a 1000 gallon underground fuel storage tank is located in the northeast portion of the dry cleaner adjacent to the existing garage door. Please refer to Figure 6. During a Phase II investigation effort, conducted by ACT, to determine the soil and groundwater quality adjacent to the underground fuel storage tank no evidence of contamination from the fuel oil tank was identified in PID readings or soil and groundwater sample results.

1.4 SUMMARY OF REMEDIAL ACTIONS

An Interim Remedial Measure (IRM) was conducted in accordance with the NYSDEC approved "Interim Remedial Measure, Remedial Investigation/Feasibility Study Report – Former Chez Valet Dry Cleaners, dated February 25,2011 – prepared by Paul P. Stewart, MS of Advanced Cleanup Technologies, Inc. (ACT) and Andris H Ledins, PE

The following is a summary of the Remedial Actions performed at the site:

1. Excavation of soil/fill was not required at the site as no VOCs were detected in any of the soil samples above Soil Cleanup Guidelines (SCGs).

2. Special attention was given to the construction of a new concrete slab over the building area previously housing the dry cleaner operation. The slab was designed and constructed in order to provide a vapor tight barrier against potential soil gas vapors and will be discussed in later sections of this document.

3. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.

4. In addition to the existing floor slabs of the buildings in the new slab placed in the location of the previous dry cleaner operation area, a Soil Vapor

[2] PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT, 1 – 3 Manorhaven Blvd., Port Washington, NY 11050, October 30, 2006 prepared by Advanced Cleanup Technologies, Inc. Environmental Consultants

Extraction/Sub-slab Depressurization (SVE/SSD), system was installed. This system will be discussed later paragraphs of this document.

5. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Interim Remedial Measures were completed at the site in February, 2011, after which continued operation of the SVE/SSD commenced.

1.4.1 Site-Related Treatment Systems

This section will serve to document the as-built conditions of the Soil Vapor Extraction (SVE)/Sub Slab Depressurization System (SSD) installed underneath the floor slab structures located at 1–3 Manorhaven Blvd., Port Washington, NY (the "Site"). Due to the presence of soil gas vapors, specifically tetrachloroethene and trichloroethene under the floor slab of the existing structures it was determined that a sub slab depressurization system was necessary to address any potential exposure to occupied spaces within the structure.

A soil vapor extraction pilot test was conducted on March 6, 2009 by (ACT) and witnessed by Andy Ledins, NYSPE. Key design information obtained during this study was utilized in the design of the sub slab depressurization system. The primary information utilized from the field pilot study data pertained to the vacuum pressure required to produce a zone of negative pressure or radius of influence (ROI) under the floor slab. This ROI would determine the location of vent wells of the permanent system installation.

Data obtained during the pilot test allowed for the evaluation of pressure drop in the subsurface soils at incremental distances from a fixed extraction point (vacuum well). This data showed that for varied vacuums between 10 to 52 inches of H_2O shallow sub slab vacuum pressures were readily measured up to 30 feet from the vacuum point. For the purposes of design it was assumed that an ROI of 15 feet would be used to provide an adequate safety factor as well as consideration for nonhomogeneous fill that could exist under the salon.

For the purposes of this document we will refer to the area formerly occupied by the previous owner, Chez Valet Dry Cleaners as the "North Room" and the area presently occupied by the salon as the "South Room".

North Room

During the initial stages of project the owner removed all remaining equipment utilized by the previous owner from the North Room. Floor coverings were removed to expose the existing concrete floor slab and wall coverings were removed to expose the wood framing and cinderblock structures of the outer walls of the North Room.

Examination of the existing floor slab showed concrete with cracks, inadequate structural quality and poor finish that would be an impediment to the placement of a synthetic liner system which was required to produce a gastight vapor seal. In addition closer inspection of the basement structure revealed that the concrete masonry unit walls were also structurally unsafe. Given that the basement was the proposed location of the SVE/SSD system's mechanical equipment, this area would need to be reinforced to a structurally sound condition prior to its utilization.

To this end the entire floor slab within the footprint of the North Room was removed, crushed and utilized as fill material in areas of the North Room that needed to be brought up to the proposed finished grade. The basement area had new reinforced, poured in place concrete walls and floor constructed.

The design of the sub slab depressurization system in the North Room utilized horizontally placed piping with 4 foot screen sections placed at defined locations. The location of the screens was based on a 15 foot ROI that in combination would allow full coverage of the North Room footprint. Please refer to the Attachment 2 – As Built Drawings. Each 4 foot section of screen is connected by an individual pipe to the basement area where a dedicated control valve could be utilized to balance each leg of the system. The horizontal piping screens were bedded in bank run gravel and wrapped in geotextile to protect the system from damage and from fine material migrating into the screens and extraction equipment.

Once the piping system was installed, gravel was used to bring the entire area to a uniform elevation. The gravel (well-rounded) serves to protect the liner placed on top of it as well as provide a porous media that would propagate the vacuum influence over the required areas. A high-density polyethylene (HDPE) liner was

placed on top of the liner as a vapor barrier. All seams as well as utility penetrations and terminations along outer walls were sealed as noted on the as built drawings. A reinforced concrete slab was poured over the entire North Room area including the now reinforced basement area. It should be noted that all pipe penetrations into the basement area were cast into the new concrete wall which provides excellent sealing against vapor migration. All mechanical equipment was placed into the basement and all piping connections completed prior to the concrete being poured over it to form the ceiling structure of the basement.

South Room

The salon area or South Room is an active hair salon. Because of this, the design for this area incorporated vertical wells into the sub slab to complete the depressurization system for this area. The vertical Wells could be quickly and efficiently installed next to existing interior partitions, structures or outer walls with minimum disturbance to the existing floor. Piping could then be run vertically to an elevation above the hung ceiling where it could then be routed to the sub slab depressurization system in the North Room.

Well locations in the South Room were selected to allow for 15 foot ROI. Four Wells were utilized to provide coverage of the entire South Room. Similar to the construction of the horizontal wells in the North Room, the South Room's wells can be individually controlled from the basement area where the mechanical equipment is installed.

In general, the installation of the sub slab to depressurization system was performed in accordance with the required design.

System Startup:

Initial system shakedown and startup took place on February 7, 2011. All sub slab depressurization system equipment was individually checked and tested independently and apart from the piping system to make sure all components were in working order and had proper system settings. Two, 55 gallon capacity, vapor phase carbon drums are connected to the exhaust of the sub slab depressurization system to treat any potential chemicals of concern prior to discharge to the atmosphere outside of the building. All connections and valve settings to the vapor phase carbon drums were inspected prior to applying vacuum to the sub slab piping system.

Initial system balancing efforts were conducted on February 7, 2011. System balancing involved modulating the valves in the basement area while measuring a total of seven vapor points located in both the North and South Rooms.

ACT had installed 2 vapor points in the South Room and 5 vapor points in the North Room through the floor slab of those areas prior to start up. Each vapor point was installed through the slab, grouted to ensure vapor tightness and fitted with plugs. During testing and start up these plugs were removed and replaced with ball valves and a barbed end fitting that would allow the connection of a vacuum measurement device.

As the system is balanced, all vapor points are monitored and recorded for vacuum measurements. Valves were then adjusted at the vacuum unit to modulate the vacuum and flow to the individual legs. This is done until all the vacuum points have fairly uniform vacuum readings. Please refer to the attached as built drawings which includes a summary of readings taken on 2/7/2011.

During the initial system balancing efforts, air samples were also taken from the exhaust of the sub slab depressurization system. Holes were drilled in the PVC piping before and after the carbon drums. Analytical results of exhaust samples collected before and after carbon treatment detected a 99.5% reduction of tetrachloroethene (PCE) concentrations. Post treatment exhaust detected PCE at 4.68 micrograms per cubic meter ($\mu g/m^3$), which is significantly below the PCE air guideline value of 100 $\mu g /m^3$. In addition, air samples were gathered utilizing summa canisters that would be analyzed for chemicals of concern.

Due to a malfunctioning of one vertical well in the South Room, a rebalancing effort was conducted on February 16, 2011. During this effort a disconnected pipe was identified and repaired. This repair enabled all the Wells in the system to be put online in accordance with the design intent. Vacuum readings were achieved in all the vapor points varying from -0.015, to -0.091 inches of H2O.

Information regarding the installed equipment, its performance curves, power utilization, etc. can also be seen on the attached as built drawings.

In summary, the sub slab depressurization system is operating as envisioned and in accordance with the intended design. Additional system balancing may be warranted as remedial efforts progress and more or less flow have to be focused to targeted areas.

1.4.2 Remaining Contamination

As determined by the characteristics of the soil, soil vapor and groundwater contamination identified at the site, Tetrachloroethene is the chlorinated volatile organic compound released from the site at concentrations exceeding applicable standards, criteria and guidance. The following paragraphs will discuss the current levels of contamination at the site.

Soil quality

Soil samples collected beneath the on-site building contain concentrations of Tetrachloroethene that are below unrestricted use soil cleanup objectives. The maximum extent of soil contamination was found beneath the former dry cleaning machine (SP – 09), where 190 µg/kilogram of Tetrachloroethene was found at a depth of 10.5 feet.

Soil Vapor Quality

Tetrachloroethene was detected in soil vapor beneath the on-site building at levels exceeding NYSDOH Matrix II guidance values. The highest concentration of Tetrachloroethene and sub-slab soil vapor was found beneath the former dry cleaning machine (13,700 µg/cubic meter at VP – 03S)

Groundwater Quality

The maximum extent of groundwater contamination was also identified directly beneath the former dry cleaning machine (TW – 06) at a depth of 12 feet where 68 µg /L Tetrachloroethene was found. However, no vertical contamination was identified at a depth of 38 feet in close proximity to the former dry cleaning machine (TW – 14). The maximum sent to the offsite groundwater contamination (35 µg /L) was identified approximately 200 feet down gradient of the site (MW–04).

Based on a previously prepared Qualitative Exposure Assessment, it was concluded that:

a. Soil posed no exposure risk as it did not exceed applicable standards.
b. People are not drinking the contaminated groundwater because public water serves the area and is not affected by site contamination.
c. Exposure to soil vapor has been mitigate with the installation of the SSD/SVE and corresponding polyethylene vapor barrier with poured concrete floor over the area of potential contamination.

The site conditions prior to implementing the IRM (SSD/SVE) have previously been summarized in Paragraph 1.3 of this report.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining groundwater and soil vapor impacts exist beneath the site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

Exposure ,through direct contact, to remaining contamination at the site is prevented by the overall physical characteristics of the site. As previously discussed, almost the entire site is covered by pavement or existing building structures. The buildings themselves are constructed on slab with only one area having a small basement that now houses the SVE/SSD system. The "North" room of the building structure has had a new polyethylene liner placed over its entire footprint with a new floor slab poured on top of it as described in the startup/as-built section of this report.

2.2.1.2 Sub-slab Depressurization/Soil Vapor Extraction Systems

In order to address residual sub-slab soil vapor issues, a Soil Vapor Extraction/Sub-slab Depressurization (SVE/SSD) was installed in conjunction with a polyethylene liner and new floor slab for the "North Room" of the existing structure. While the polyethylene liner and new floor slab address the area of the former dry cleaner operation, that is, the "North Room", the SVE/SSD was designed and constructed to impart a vacuum on both the "North" room as well is the hair salon. Please refer to Attachment 2.

The "North" room has eight horizontal, 2 inch diameter well screens (4 feet long), 4 which are placed East of the basement area and 4 West of the basement area under the newly installed polyethylene liner and floor slab. These well screens were placed in rounded pea gravel and protected with geotextile. Post startup readings showed excellent ROI distances as would be expected with this type of construction.

The salon has four dedicated vertical wells installed to impart a subsurface vacuum below the existing floor slab. These wells were installed by coring through the existing concrete floor and placing a 1 to 2 foot long 2 inch diameter well screen vertically under the slab. The opening was grouted tightly around the vertical piping leading to the well screen thus providing a vapor tight seal. 2 inch diameter PVC piping was then run vertically into the hung ceiling and back to the SVE/SSD equipment located

in the basement area of the "North" room for each of the four Vertical wells. Post startup readings showed that required vacuums and ROI's were accomplished, however, the sub-slab material was much tighter than that of the North room and required careful balancing of the system.

All wells in the salon as well as the "North" room are individually piped back to a main header in the basement area of the "North" room. Each line can be individually balanced utilizing a ball valve. The vacuum is applied by a preassembled, skid mounted, regenerative blower that imparts the vacuum and flow required. Please refer to Attachment 2. The skid mounted a system is typical for this type of installation and easily monitored and maintained.

The exhaust from the blower passes through 2-55 gallon drums containing air phase carbon which will capture the target VOC compounds removed by the system. Sampling points before, between and after the drums are available for air monitoring purposes.

The system is designed to be operated 24 hours per day and seven days per week. It has been operating in this manner from its startup in February 2011.

Procedures for operating and maintaining the SVE/SSD system are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP).

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.2 Soil Vapor Extraction/Sub-slab Depressurization (SVE/SSD)

The active SVE/SSD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SVE/SSD system is no longer required, a proposal to discontinue the SVE/SSD system will be submitted by the property owner to the NYSDEC and NYSDOH.

Conditions that warrant discontinuing the SVE/SSD system include contaminant concentrations in soil vapor that: (1) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC, or (2) the NYSDEC has determined that the SVE/SSD system has reached the limit of its effectiveness. This assessment will be based in part by reviewing the historical system performance as well as remediation contaminant levels in indoor air samples from both the “South “ room, and "North" room as well as Sub- Slab soil vapor samples from the “North” and “South” room. The SVE/SSD system will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

2.2.2.3 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the ROD, to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to commercial uses only. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical complements of the remedy shall be performed as defined in the SMP.
- Access the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to ensure compliance with the restrictions identified by this Environmental Easement.

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property use is subject to local zoning laws, the remedy allows the use and development of the controlled property for residential, restricted residential, commercial and industrial uses as defined by Part 375 – 1.8 (g),

provided that the long-term Engineering and Institutional Controls included in this SMP are employed.

- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed within the property boundary and any potential impacts that are identified must be monitored or mitigated;
- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Soil Vapor Intrusion (SVI) Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This

work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. Validated SVI data will be transmitted to the property owner within 30 days of validation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 30-day notice will be required for the Department to review plans and supporting information that proposes changes to the SVE/SSD system (i.e. remove carbon, remove or relocate extraction point, etc..) Based on the Department's review approval may be provided. Should approval be provided the Site Management Plan shall be revised accordingly.
- 7-day advance notice of any proposed ground-intrusive activities.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective

purchaser has been provided with a copy of the Order on Consent and all approved work plans and reports, including this SMP

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to qualified environmental professional These emergency contact lists must be maintained in an easily accessible location at the site.

Table 4: Emergency Contact Numbers

Port Washington Emergency Response	911
Port Washington Fire Department	516-742-3300
Port Washington Police Department	516-883-0500
One Call Center:	(800) 272-4480 (3 day notice required for utility mark out)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 5: Contact Numbers

Property owner Port Manor Realty, LLC d/b/a Country Cleaners 1-3 Manorhaven Boulevard Port Washington, NY 11050 Donald Markowitz	(516)883-9571
Property Manager: 1-3 Manorhaven Boulevard, LLC 26 Harbor Park Drive Port Washington, New York 11050 David Brodsky	516-484-4400 EXT 1316
Operations and Maintenance: Ross G. Hibler Jr. Area Manager Severn Trent Environmental Services 100 Morris Ave, Unit #3 Glen Cove NY, 11542	Office 516 674 6032 EXT 228 Cell 516 315 6787
Project Engineer: Andris H. Ledins, NYSPE 2 South Farm Road Sands Point, NY 11050	516-790-3596 Mobile 516-467-4537 Office

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: 3 Manorhaven Blvd., Port Washington, NY 11050

Nearest Hospital Name: St. Francis Hospital

Hospital Location: 100 Port Washington Blvd., Roslyn, NY

Hospital Telephone: 516-562-0100

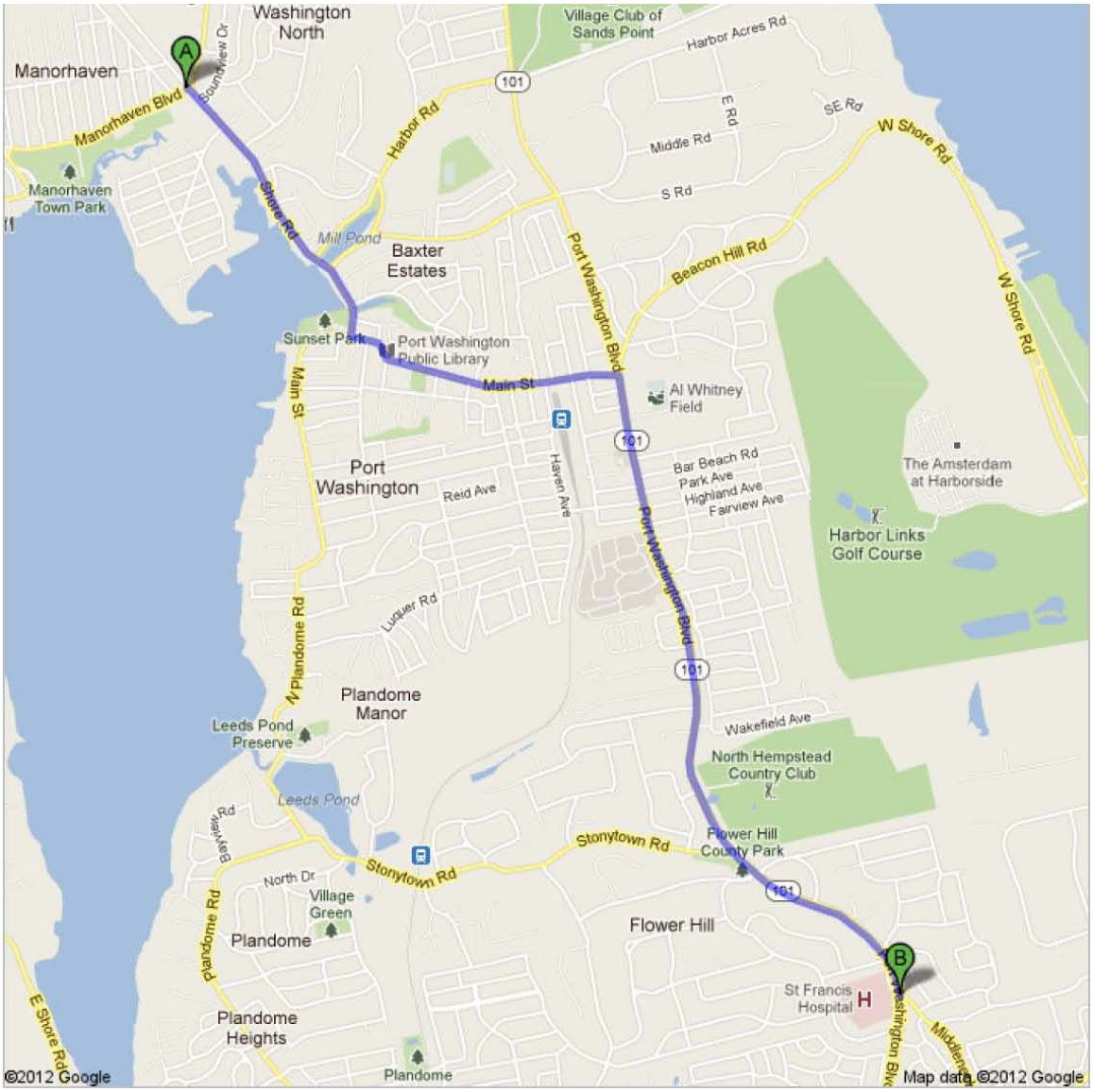
Directions to the Hospital:

1. Head Northeast on Manorhaven Blvd. toward Sands Point Road
2. Take the first right onto Shore Road
3. Turn left onto Main Street
4. Take the second left to stay on Main Street
5. Turn right onto Port Washington Boulevard
6. Turn right to stay on Port Washington Boulevard
7. Turn right into St. Francis Hospital 100 Port Washington Blvd.

Total Distance: 3.9 miles

Total Estimated Time: 8 min.

Map Showing Route from the site to the Hospital:



2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan - Table 4. The list will also be posted prominently at the site and made readily available to all personnel at all times.

2.5.4 Encountering Unknown Subsurface Contamination

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the polyethylene/slab cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor,);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;

- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Annual monitoring of the performance of the remedy and overall reduction in contamination on-site and off-site will be conducted for the first two years. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in air, soil vapor and groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 6 and outlined in detail in Section 3.3 below. Site inspections will be conducted as discussed in Sections 3.2 and 3.4.

Table 6: Monitoring Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Annual or as directed by NYSDEC or NYSDOH (End 1st qtr.)	Groundwater	Target Volatile Organic Compounds (VOC's) EPA Method 8260B
Indoor Air, Sub-Slab Soil Vapor And Ambient Air (North and South room)	As directed by NYSDEC or NYSDOH	Air	VOC's EPA Method TO-15
Soil Gas (SVE/SSD) Discharge – prior to and post vapor phase carbon units	Annual or as directed by NYSDEC or NYSDOH (End 1st qtr.)	Air	VOC's EPA Method TO-15
Soil Gas (SVE/SSD) Influent to Primary vapor phase carbon vessel	Monthly – 1st year Quarterly 2nd Year	Air	VOC's Calibrated Photoionization Detector (PID sweep)
Soil Gas (SVE/SSD) Influent to Secondary vapor phase carbon vessel	Monthly – 1st year Quarterly 2nd Year	Air	VOC's Calibrated Photoionization Detector (PID sweep)
Soil Gas (SVE/SSD) Discharge - after vapor phase carbon units	Monthly – 1st year Quarterly 2nd Year	Air	VOC's Calibrated Photoionization Detector (PID sweep)

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 COVER SYSTEM MONITORING

As a mentioned in paragraph 2.2.1.1, most of the site is covered by slab on grade construction, sidewalk or parking lot pavement. Only a small basement area exists that houses the SVE/SSD system.

During remediation, parking lot, sidewalk pavement and building slabs systems will be monitored to ensure that no construction activities breach the soil capping system without proper repair. For all slab and pavement systems outside of the North Room perimeter repairs shall be made with appropriate replacement materials (asphalt, concrete, etc.). Any annular space remaining after repair/patch shall be filled with compatible caulking compounds or non-shrink grout. In the North Room, any floor penetrations will require appropriate repairs to the HDPE liner system in addition to floor slab replacement.

3.3 MEDIA MONITORING PROGRAM

The media monitoring program for this site will include:

- Groundwater
- Sub-slab vapor
- Ambient Air

3.3.1 Groundwater Monitoring

As discussed in Paragraph 1.3 of this report, based on the findings of the RI, the past disposal of hazardous waste has resulted in minimal contamination of groundwater. The SVE/SSD system will remove any PCE soil contamination in the Vadose Zone that may be contributing to the groundwater contamination.

Groundwater monitoring will be performed on a periodic basis to assess the impact of the SVE/SSD system as well as natural attenuation..

The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the site. The network of on-site and off-site wells has been designed based on the following criteria:

Groundwater Flow Direction – based on previous studies, and general knowledge of regional groundwater flow, it was determined that groundwater is the area generally flows in a southwesterly direction towards Manhasset Bay and is typically encountered approximately 7 feet below grade. Please Refer to Figure 2. MW–03 is an on-site up gradient well, while MW-01 and 02 are off-site wells located on the adjacent municipal property and MW-04 and 05 are located across Manorhaven Boulevard.

Monitoring Well -and soil boring records can be seen in Attachment [3]. Well No's 3, 4 and 5 were installed by ACT and are described in detail in the aforementioned Attachment. Well No's 1 and 2 were installed by Berninger Environmental, Inc. (BEI). A description of the installation was presented as part of a letter dated January 27, 2006:

> *"In order to evaluate site-specific groundwater flow at the subject property 3, 1-inch diameter piezometers were installed at the subject property on December 14, 2005 by BEI utilizing the geo-probe drilling technique. The piezometers were constructed such that a 10 foot length of 1 inch diameter, Schedule 40, 0.020 – inch slotted PVC well screen was set 7 feet into and 3 feet above the water table interface (between 8 to 9 feet below grade surface [BGS])."*

Monitoring well sampling and analysis shall follow the requirements presented in Paragraph 3.1.2. The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

All samples are to be submitted to an ELAP certified laboratory, when selecting a laboratory please check, http://www.wadsworth.org/labcert/elap/comm.html . Deliverables for the groundwater monitoring program are specified in Section 5.3..

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix [1]. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

The Sampling Protocols have been prepared to support the groundwater monitoring programs for this site. Long-term monitoring at the site includes the collection and analysis of environmental samples for groundwater. These protocols detail procedures for field preparation, well evacuation, sample collection, sample preservation and handling, sample containers, sample custody, sample analysis, quality assuarace/quality control, and recordkeeping. This is presented in detail in Section 4.3.4 Sampling Event Protocol, located in this Site Management Plan.

Field preparation – A sampling team is established prior to each event. The team holds a pre-sampling meeting in order to:

- Review the monitoring and sampling procedures described in this plan:
- Assemble and inspect all equipment and verify that equipment is clean and proper working order;
- Replace or repair any items that are in short supply or improper working condition;
- Calibrate all equipment to manufactures specfications
- Examine Sample Containers to verify that the proper number and type of containers were delivered by the laboratory;
- Establish a well evacuation and sample collection schedule for the sampling event.

Groundwater Sample Collection

Examination of the Well.

- Verify that the well is not damaged. Note on the monitoring sheet any signs of tampering. Also, note the condition of the well casing, and well cap.
- Carefully remove the well cover or cap to avoid having foreign objects enter the well.

- Sample the well vapors immediately upon opening with a Photo-Ionization Detector (PID), record the readings on the Monitoring logsheet.

Collecting Water Level Measurements

- The depth to groundwater is measured from the surveyed reference mark on the well casing or riser to an accuracy of 0.01 foot. An electronic water level indicator shall be used to collect this measurement.
- The total depth of the well is then measured to determine the volume of water within the casing. The measurements must be compared to the recorded established depth to determine how much, if any, sediment has accumulated in the bottom of the well. If there are more than six inches or more sediment in the well, the well must be redeveloped prior to sampling.
- To avoid cross contamination, the water level indicator is wiped clean and rinsed with distilled water after each use.
- Log both the depth to water measurement and total well depth measurement on the monitoring sheet along with the date and time the measurements were collected.

Purging (Evacuating) the Well-

The purge method chosen to be utilized at the site has been a modified Low Flow/ Low Stress method. The purge method is described below.

- After the Well has been screened with the PID and gauged for depth to water and depth to bottom. The Water Level Indicator probe is left at the depth water elevation.
- Dedicated Polyethylene tubing is lowered to where the tubing intake is approximately set at the midpoint of the screened interval of the well. The discharge side of the polyethylene tubing is connected to dedicated silicone tubing, which is installed in the working mechanism of the Peristaltic pump. Another length of dedicated Polyethylene Tubing is

connected to the discharge end of the Silicone tubing. The discharge end of the last length of polyethylene tubing is connected to the inlet side of the Water Multi-meter Flow through Cell. One last section of tubing is connected to the discharge side of the Flow through Cell and will discharge water into a collection pail.

- Log the initial Depth to Water Reading and time;
- Initiate the Calibrated Multiparameter Water Meter (Horiba U-22 or similar).
- Activate the Pump;
- Adjust the speed of the pump to between 100 ml to 500 ml/min, use a graduated cylinder and a stop watch to calculate the flowrate.
- Confirm that the flow rate is not "drawing down" the water level drastically, (the water level should not drop more than 0.3 ft during the purge and sample process).
- Every 5 minutes log the Water Level Elevation (The small well Diameter, might make this impossible or to difficult to collect each 5 minute interval), Purge Flow rate, pH, Specific Conductivity, Turbidity, Dissolved Oxygen, Temperature, and Oxidation Reduction Potential, on the monitoring sheet.
- Purging will continue until the parameters have stabilized, that is achieved when all of the items below are concurrently satisfied.
    - Depth to Water does not go anymore then 0.3 ft below initial water level reading
    - pH reading is□± 0.2 S.U for three consecutive readings
    - Specific Conductivity readings are ± 0.020 mS/cm for three consecutive readings
    - Turbidity readings are 50 NTU's and under and ± 10% for three consecutive readings
    - Dissolved Oxygen is ± 0.2 mg/L for three consecutive readings
    - Oxidation Reduction Potential (ORP) is ± 20 mV for three consecutive readings.

- After the Sample is collected (see Protocol Below), Note on the log sheet the Sample Time, volume of Purge water collected. Screen vapor above the purge water with the PID, discharge purge water to ground is the PID screen is 0.0 ppm, if there is a hit on the screen, cover the Pail with the appropriate secured cover. Mobilize the covered Purge water pail to the SVE/SSD enclosure and label with appropriate " Pending Analysis" Label. The label should include the date and time it was collected, as well as the monitoring well it was collected from. Final disposal will be determined upon receipt of the analysis.

Sample Collection-

- Only volatile organic samples (EPA Method 8260), are required at this point.
- Collect the samples after the flow through cell has been disconnected from the Peristaltic pump tubing. Do not let the tube touch the rim or inside of the sample vial.
- Fill the vial's over the Purge water pail, fill until there is a meniscus atop the vail and cap with the provided vial cap. After the cap is secured flip the vial upside down and tap against the side of your gloved hand to confirm there are no air bubbles in the bottle.
- Label all of the vial containers with the Sample location, Date and Time of collection and requested Analysis as well as the samplers initials.
- Put the sample vials in a plastic bag, then place on ice.
- Submit the Samples to the designated laboratory.

- Analytical methodology:
  - Lab certification;
  - Analytical methods;
  - Analytes.

3.3.1.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.2 Sub-slab Soil Vapor Monitoring

As presented in Paragraph 1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS, sub-slab soil vapor and indoor air samples exceeded guidance values defined by NYSDOH guidance documents. The installed SVE/SSD system has been designed to remediate these impacts and prevent vapor migration into occupied spaces. In order to monitor the effectiveness of the system sub-slab vapor samples are taken and analyzed in accordance with the requirements presented in Paragraph 3.1.2. These requirements are stipulated by the ROD.

It is anticipated that the site will require visits, during the first year of operation, to ensure that the equipment is properly maintained and the system is operating effectively. For the purposes of the monthly site visit, a photoionization detector (PID) will be utilized to monitor the efficiency of the off gas treatment system consisting of 2 – 55 gallon air phase carbon units.

At a minimum, the following sampling points will be monitored during operations and maintenance visits:

Sub-Slab (Vapor)	Inlet air to carbon units, from Sub-Slab collection system
Off Gas Treatment System	1. Air sample between "lead" and "lag" carbon drum 2. Discharge air sample after "lag" carbon drum
Sub-Slab (Negative Pressure)	Negative pressures at 7 existing vapor points through the slab of the Salon and the North Room will be measured and recorded during scheduled site visits.
Out Door Air	An air sample of outdoor air will be taken with a handheld field PID

SVE/SSD System Vapor Sample Protocol

There are two components to the SVE/SSD systems sampling, one is regular screening the other is actual Volatile analysis. The screening is done along with the regular monthly system monitoring, the actual Volatile Laboroatory analysis is to be performed annually.

SVE/SSD System Screening

- A PID screen is collected from the SVE/SSD enclosure, the parking lot outside the SVE/SSD enclosure.
- Calibrate the PID as per the manufacturers standards and log the results of the calibration in the onsite log book.
- Collect readings from the most probable cleanest location to most probable dirtiest location.
- Log the times and locations when the readings are taken.

SVE/SSD System Monitoring and Sampling

- The SVE/SSD system is sampled annually, and analyzed by EPA Method TO-15;
- Samples are collected from the Pre Carbon sample port located prior to the primary Carbon Vessel, as well as from the system discharge sample port located after the secondary Carbon Vessel.
- These are grab samples utilizing 6 Liter Summa Canisters with 2 micron filters , and dedicated disposable Teflon Tubing.
- Prior to sample collection the Vacuum in each Summa Canister is logged in the logbook;
- Dedicated Tubing is attached to the Summa Canister inlet and designated sample point
- Open the Summa Canister valve and sample point valve to collect sample until the Vacuum in the Summa canister has dropped to approximately 5 in Hg, then close Summa Valve then the Sample Point Valve.
- Log the Sample ID and Sample Point, and date and time of the sample collection in the site logbook.
- Complete the Chain of Custody and submit the samples to the designated laboratory.

3.3.2.1 Site Closure Soil Vapor Samples

When the site is being petitioned for closure, part of the closure procedure is to collect Soil Vapor Samples after the SVE/SSD system has been off for a period of time, to allow the local soil vapor to rebound. After the SVE/SSD sytems has been down for 6 weeks, soil vapor samples will be collected from Vacuum Point 4 (VP-4), and Vacuum Point 3 (VP-3).

System Shutdown Soil Vapor Sampling Procedure

- The soil vapor will be sampled 6 weeks after the SVE/SSDhas been shutdown, and analyzed by EPA Method TO-15;
- Samples will be collected from VP-4 in the "South" Room and VP-3 in the "North" room.
- These are grab samples utilizing 6 Liter Summa Canisters with 2 micron filters , and dedicated disposable Teflon Tubing.
- Prior to sample collection the Vacuum in each Summa Canister is logged in the logbook,
- Dedicated Tubing is attached to the Summa Canister inlet and designated sample point
- Open the Summa Canister valve and sample point valve to collect sample until the Vacuum in the Summa canister has dropped to approximately 5 in Hg, then close Summa Valve then the Sample Point Valve.
- Log the Sample ID and Sample Point, and date and time of the sample collection in the site logbook.
- Complete the Chain of Custody and submit the samples to the designated NELAP Certified Laboratory.

3.3.3 Indoor Air Sampling

As mentioned elsewhere in this report, indoor air samples are only required when either the NYSDEC or NYSDOH request them or if the SVE/SSD system is down for an extended period of time, or if the system is being petitioned for shutdown.

Designated sampling will be performed adjacent to the soil vapor points, identified as VP-3 and VP-4, and in the northern parking lot (ambient outdoor air sample upwind of site).

3.3.3.1 Ambient Air Sample Collection Procedure

- The sample will be an 8 hour composite, collected during the Salons normal operating hours.
- The Sample is collected in the salon utilizing a 6 liter Summa Canister equipped with a 2 micron filter , a flow controller (8 hr), and disposable dedicated teflon tubing.
- Before initiating the sample collection the Serial number and Vacuum reading of the Summa Canister will be logged.
- Then the flow controller, and tubing will be connected to the Canister. The tubing intake will be set at an elevation of 5 feet above ground.
- The valve of the Summa Canister will be opened and the sample collection will begin – Log the time the sample was begun.
- During the sample collection observe the Vacuum level displayed on the flow controller, note changes in the vacuum level. The flow controller is supposed to allow the vacuum to slowly drop over the sample interval, at the end of the time interval the Vacuum should be around 5 inches of mercury.
- At the completion of the sample collection log the vacuum reading and close the valve atop the Summa Canister.
- Remove the Flow controller and associated Tubing.
- Dispose of the tubing. Complete the Chain of Custody and submit to a New York Certified NELAP laboratory for analysis.

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.

- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.6 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file on-site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on an annual basis in a Letter Report. The report (or letter) will include, at a minimum:

- Date of event;
- Personnel conducting sampling;

- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC.

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the SVE/SSD system;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the SVE/SSD system are operated and maintained.

Information on non-mechanical Engineering Controls (i.e. soil cover system) is provided in Section 3 - Engineering and Institutional Control Plan. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

As previously described in Paragraph 2.2.1.2, the Site's remedial approach consists of a **Soil Vapor Extraction/Sub-slab Depressurization System (SVE/SSD)** that imparts a negative vacuum under existing and new floor slab construction as well as paved areas of the property. The system was designed based on actual pilot study data which helped to define actual design criteria that is explained in more detail in Paragraph 1.4.2. The system is designed not only to prevent vapor migration into occupied spaces (SSD) but the high vacuum, high-volume capabilities (SVE) should assist in the removal of any residual volatile compounds from the soil media below the areas previously occupied by the dry cleaners.

The original design required a vacuum blower capable of inducing a vacuum of 100 inches of water at 150 CFM. A skid mounted system was provided and installed by Coastal Environmental Group, Inc. Central Islip, NY (Coastal). Coastal provided a skid

mounted unit manufactured by Airtech Vacuum out of Englewood, New Jersey. This skid was preassembled and fitted with an Airtech Vacuum regenerative blower Model 3BA1630 – 7AT36 that is rated up to 120 inches of water vacuum at 300 CFM. Please refer to as built information in Attachment [2]. It is anticipated that the actual vacuums and flow rates will be different based on field conditions once balancing of the system is completed and the air flow through the subsurface media stabilized.

The package system discharges through 2-55 gallon air phase carbon filters that will serve to remove chemicals of concern. The air phase carbon filters serve as a lead lag which will enable operators to monitor breakthrough through the first carbon drum, thus allowing them to change drums as the media becomes is spent. The discharge from the carbon drums exits through the roof to an exhaust stack that terminates 24 inches above the highest point of the roofline.

The remedial system is located in a basement area underneath the "North Room". During construction the basement area was reinforced with a new floor slab, vertical walls and metal deck supported concrete ceiling which was poured monolithically with the floor slab described in the following paragraph. The entrance to this area is from the outside and its location and surrounding structure serves to eliminate sound penetrating into the occupied or soon to be occupied spaces.

As previously described, the indoor structures are comprised of two rooms, the "North Room" or previous location of the dry cleaners, and the "Salon" location of the existing operational hair salon. The "North Room" has had all the existing dry cleaner equipment removed along with the entire and interior which was demolished to the exterior wall, wood studs. The concrete floor was also removed and a new floor with HDPE liner installed as described in previous sections of this document.

The "North Room" at horizontal Wells installed in porous media prior to the installation of the HDPE vapor barrier and new concrete floor. The horizontal Wells were comprised of 4 foot sections laid out in a manner that would provide comprehensive vacuum coverage under the slab once operational. Four wells were installed to the West of the equipment room previously described and four wells were installed to the East. Each well was individually piped to the equipment room allowing for proper balancing of the system.

The "Salon" is presently being occupied and serves as a hair salon. 4 vertical wells were installed through the existing floor slab to a depth of 2 feet. The well screens have gravel placed around them and were grouted at surface to provide a vapor tight seal

with the existing floor slab. Individual solid PVC pipe was then run back to the equipment room, from the vertical wells, to allow for individual wells to be balanced independently.

In order to monitor the effectiveness of the sub slab vacuum, vacuum points were installed through the floor slab. 5 points were installed in the "North Room" and 2 in the "Salon". Please referred to Attachment 2. During system startup and periodic operation maintenance visits to the site, these vapor points are monitored with a vacuum gauge. If necessary, throttling valves on individual lines are modulated in the equipment room to obtain as homogeneous as possible vacuum under the entire floor slab. These vacuums are recorded and reported in the site reports. There are a total of 8 valves for the "North Room" and 4 valves for the "Salon" that can be modulated to obtain optimal vacuums.

The system was completed and commenced operating in February, 2011.

4.2.1 Scope

The SVE/SSD system described in the previous paragraphs and sections of this SMP contains only one motorized piece of equipment, that is, the regenerative blower. Due to the simplicity of the skid mounted installation, this document will refer to the manufacturer's instructions for the operation and maintenance of the regenerative blower and the following paragraphs will primarily discuss inspection and operational requirements of the system.

4.2.2 System Start-Up and Testing

A. Manufacturer's recommendations

As previously mentioned, please refer to Attachments 2 and 4 For manufacturers recommendations on the operation and maintenance of the regenerative blower installed as part of the SVE/SSD skid unit.

B. Pre-start up inspection;

Primary system components that need to be inspected prior to start up include:

- horizontal and vertical sub-slab vent wells
    - carefully inspect all piping and valves to ensure that no leakage is present

- Replace/repair any defective piping, connections, valves, etc.

- through slab vapor monitoring points
  - Inspect all through slab vapor monitoring points to ensure that all needle valves are in the off position or plugs are installed. These valves are small and prone to breakage if improperly protected.

- vacuum extraction system (skid mounted vacuum system)
  - Follow manufacturers installation and operations & maintenance instructions for installing skid mounted system.

- off gas treatment system (vapor phase carbon drums)
  - Inspect vapor phase carbon drums to make sure that all connections (inlets & outlets) are properly connected in accordance with air flow direction.

C. System Start Up

The following steps should be followed during start up:

1. Vapor Sampling Points – remove plugs and install small ball valve with barbed connection at each vapor sampling point. The barbed connection will allow vacuum gauge to the connected during system balancing.
2. Horizontal and Vertical Sub-slab Vent Wells – make sure all valves and equipment room (basement) our full open at start up thus allowing maximum amount of flow to go to all wells.
3. Vacuum Extraction Skid
   a. Inspect vacuum extraction skid making sure all system complements are properly assembled and all connections properly made.
   b. Close drain valve on system knockout pot.
   c. Inspect air filter between knockout pot and regenerative blower making sure filter is properly installed.
   d. Make sure all valves between vacuum extraction skid and vapor phase carbon units are open.

4. Vapor Phase Carbon

   Inspect vapor phase carbon units making sure all connections are properly made to inlet and outlet ports respectively. Make sure all connecting valves are full open and sample ports are closed.

5. System Startup

   a. Start regenerative blower carefully monitoring vacuum pressures at knockout pot. Check to make sure air is flowing through system, including vapor phase carbon units, without obstruction.

   b. Once system has achieved a steady-state operation, commence system balancing.

6. System balancing

   a. Utilizing a vacuum gauge capable of measuring to 0.01 inches of water, measure vacuums at all vapor points through the floor slab being careful to note the vacuum point number and location with each vacuum reading. Make sure to zero out vacuum gauge prior to measuring each vacuum point. Carefully attach connection hose the barbed connection and open isolation valve to obtain vacuum measurement.

   b. Return to control room and carefully note which vacuum points need to be balanced. Carefully modulate throttling valves for the specific leg near the vacuum point requiring adjustment. I.e. modulate the well screen closest to the vacuum point.

   c. After resetting the valves, return and take vacuum gauge measurements at each vapor point. Repeat this sequence until a uniform vacuum (or as close as possible) is achieved in all areas.

   d. System balancing should be monitored over the first few months of operation as pressure gradients will propagate outward from the well screens over time until they reach an asymptotic level for the site. Expect groundwater levels, barometric pressure, etc. to influence pressure readings and require readjustment of the system.

D. Baseline measurements;

At restart of operation baseline measurements should be taken for:

- baseline ambient air if directed
- indoor air if directed
- sub-slab vapor (= vapor phase carbon inlet)
- vapor point vacuum measurements
- knockout pot vacuum measurement
- run time meter documentation

The system testing and balancing described above will be conducted if, in the course of the SVE/SSD system lifetime, significant changes are made to the system, and the system must be restarted. Sub-slab vacuum readings will be taken at each Operation & Maintenance site visit to verify and document that a vacuum is being maintained by the system. These readings will be presented in periodic site monitoring reports.

4.2.3 System Operation: Routine Operation Procedures

The system has been designed to operate 7 days per week 24 hours per day. A run time meter has been installed as part of the skid system to record total runtime hours. This information will be used to document the total % runtime between site inspections and/or periodic maintenance visits. The system should the operated as close as possible to full-time at a steady-state while maintaining a negative sub-slab pressure.

4.2.4 System Operation: Routine Equipment Maintenance

Given the simplicity of the system, very little maintenance is anticipated. The following complements should be checked to each maintenance visit:

- Check and drain knockout pot (if required)
- Inspect inlet air filter to regenerative blower
- Document run time meter reading

- Maintain regenerative blower in accordance with manufacturer's instructions
- Check inlet to vapor phase carbon system with field PID
- Compare inlet PID readings to lead carbon vessel outlet and lag carbon vessel outlet to confirm no breakthrough is occurring.
    - If breakthrough is occurring through lead carbon vessel, move lag carbon drum to lead position and replace lag carbon drum with new drum.
    - Sample contents of carbon drum taken off-line to identify proper disposal requirements.
- Inspect all piping systems. Perform any repair/maintenance required.
- Inspect all vapor points. Perform any repair/maintenance required.

4.2.4 System Operation: Non-Routine Equipment Maintenance

Non-routine system maintenance will most likely be caused by one of the following concerns:

- Regenerative Blower Failure;

  The regenerative blower is the only piece of rotating equipment on the site. As such it is the most likely to require non-routine maintenance. However, these blowers are intended to operate continuously and it is anticipated that if routine maintenance procedures are adhered to, and manufacturers recommendations are followed, that the blower will last for the duration of the remedial effort.

- Damage;

  Damage could occur to the exposed vertical piping connecting the Wells in the salon area to the SVE/SSD system as it is an active business area six days per week. These areas along with the equipment room which has exposed piping are inspected during every routine maintenance visit. Should any damage occur, the work will be replaced in kind.

- Reduced effectiveness;

  The SVE/SSD system is primarily functioning in unsaturated soil media. Because of this, it is not anticipated that the system operation will have a reduced effectiveness. The well screens have been installed with well-rounded gravel surrounding them in order to prevent migration of fines into the system. The horizontal Wells screens are also surrounded by well-rounded gravel and are wrapped in geotextile to prevent fines from entering the system.

  During to start up an initial few months of operation, no evidence was found in the separator or inlet air filter to the regenerative blower that would imply any type of fouling within the system. Documented vacuum measurements also support that the operation is not susceptible to reduced effectiveness.

  The system’s vacuum ability as well as the concentration of target chemicals in the extracted soil vapor will be continuously monitored. If the system's effectiveness in removing chemical mass is reduced it will likely be due to the location and concentration of the chemical of concern versus the effectiveness of the system and its operation. In this event, the valves to each of the wells could be modulated to change the pressure gradients in the subsurface media. This often has a beneficial effect as the new pressure gradients could reach "dead zones" within the volume of soil being remediated. Any modifications to the system will be documented in the operations and maintenance reports.

- System or component replacement.

  Due to the system design and its application on this Site, it is unlikely that major components will need replacement. However, replacement of the air phase carbon filters, which treat the off gas from the extraction system, and the inlet air filter may be required. Regular maintenance inspections will monitor the system components.

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

The sub slab depressurization/soil vapor extraction (SSD/SVE) was installed to mitigate possible soil vapor intrusion into occupied buildings and to recover residual TCE and PCE compounds that may remain in the unsaturated zone of the site.

The system consists of eight horizontal wells installed in the "North Room" and four vertical wells installed in the "Salon". Each well can individually be throttled to balance the system and ensure that an even vacuum is imparted over the entire area of the building. The system was started in February 2011 and has been in continuous operation since system was operational in February 2011.

The effectiveness of the EC is accomplished through the monitoring of:

a. vacuum points through the floor slab – to ensure that the minimum required vacuums are maintained;

b. inlet air, to the air phase carbon treatment units – that indicate the level of chemicals of concern remaining in the evacuating airstream;

c. outlet air from the air phase carbon units – that indicate the level of effectiveness and removal of the chemicals of concern before discharge, and

d. Groundwater monitoring wells – that will confirm a steady decline of the chemicals of concern in down gradient groundwater conditions.

4.3.1 Monitoring Schedule

The system was commissioned on February 7, 2011. During commissioning the following data was collected:

Description	Comments	Anticipated Frequency
Groundwater samples from on-site and off-site monitoring wells	1 up gradient and 4 side and down gradient wells are sampled for constituents of concern.	Once per year in accordance with ROD
Through slab vacuum readings	5 vapor points are monitored in the "North Room" and 2 vapor points are monitored in the "Salon" to ensure that a negative sub slab pressure is maintained as well as to aid in vacuum system balancing. Measure sub-slab pressure with a digital monometer.	Monthly
Knockout Pot Vacuum	Observe and document knockout pot vacuum.	Monthly
Pre-vapor phase carbon units	Pre-vapor phase carbon samples will be utilized to assess existence of residual contamination and subslab region.	1. Monthly PID readings 2. annual laboratory confirmation
Between lead & lag vapor phase carbon units	PID readings between the lead and lag vapor phase carbon units will be utilized to monitor breakthrough for the lead unit.	Monthly PID readings
Post-vapor phase carbon units	Post-vapor phase carbon units monitoring will be utilized to assure discharge from system is properly treated.	1. Monthly PID readings. 2. Annual laboratory confirmation

It is anticipated that once these system's contaminant removal efficiency reaches asymptotic levels and/or cleanup requirements that monthly monitoring will be converted to quarterly monitoring events with the approval of NYSDEC.

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the

SSD/SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the SSD/SVE system are specified later in this Plan.

4.3.2 General Equipment Monitoring

A visual inspection of the complete system will be conducted during each monitoring event. SVE/SSD system components to be monitored include, but are not limited to, the following:

- for SVE/SSD systems:
  - Vacuum blower;
  - General system piping.
  - Vapor points
  - Individual well head vacuum readings gained form field portable device; and
  - Effluent concentrations and total flow exiting the carbon canisters gained from field portable device.

  Include the following text in each EC sub-section, where applicable:

A complete list of components to be checked is provided in the Inspection Checklist, presented in Appendix 2. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan are required immediately, and the SSD//SVE system restarted.

4.3.3 System Monitoring Devices

The SSD/SVE systems is fitted with a running time meter that will be recorded during each site visit. A calculation will be made to identify the % uptime for the unit. Given the simplicity of the system no audible or remote alarms have been incorporated.

4.3.4 Sampling Event Protocol

Field preparation –

A sampling team is established prior to each event. The team holds a pre-sampling meeting in order to:

- Review the monitoring and sampling procedures described in this plan:
- Assemble and inspect all equipment and verify that equipment is in clean and proper working order;
- Replace or repair any items that are in short supply or improper working condition;
- Calibrate all equipment to manufactures specfications
- Examine Sample Containers to verify that the proper number and type of containers were delivered by the laboratory;
- Establish a well evacuation and sample collection schedule for the sampling event.

Groundwater Sample Collection – See Section 3.3.1

SVE/SSD System Monitoring and Sampling (See Section 3.3.2)

SVE/SSD Shutdown Soil Vapor Sampling (See Section 3.3.2.1)

Indoor Air Monitoring and Integrated Sampling (see Section 3.3.3)

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the site will be kept on-file on-site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms (see Appendix 2) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;

- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).
- Please reference Appendix 2 – “INSPECTION CHECKLIST”

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system. Additionally, a general site-wide inspection form will be completed during the site-wide inspection (see Appendix 3). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,

- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site

Representative] (and if the site consists of multiple properties): [I have been authorized and designated by all site owners to sign this certification] for the site.

The signed certification will be included in the Periodic Review Report described below.

If the remedy requires only an institutional control, include the following:

For each institutional identified for the site, I certify that all of the following statements are true:

- The institutional control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- Use of the site is compliant with the environmental easement.
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site.

5.3 PERIODIC REVIEW REPORT

An annual Review Report will be submitted to the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Attachment 1 (Metes

and Bounds). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.

- A performance summary for all treatment systems at the site during the calendar year, including information such as:
    - The number of days the system was run for the reporting period;
    - The average, high, and low flows per day;
    - The contaminant mass removed;
    - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
    - A description of the resolution of performance problems;
    - A summary of the performance, effluent and/or effectiveness monitoring; and
    - Comments, conclusions, and recommendations based on data evaluation.

The Periodic Review Report will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation. Analytical results will be submitted in an Electronic Data Deliverable (EDD) to the NYSDEC.

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

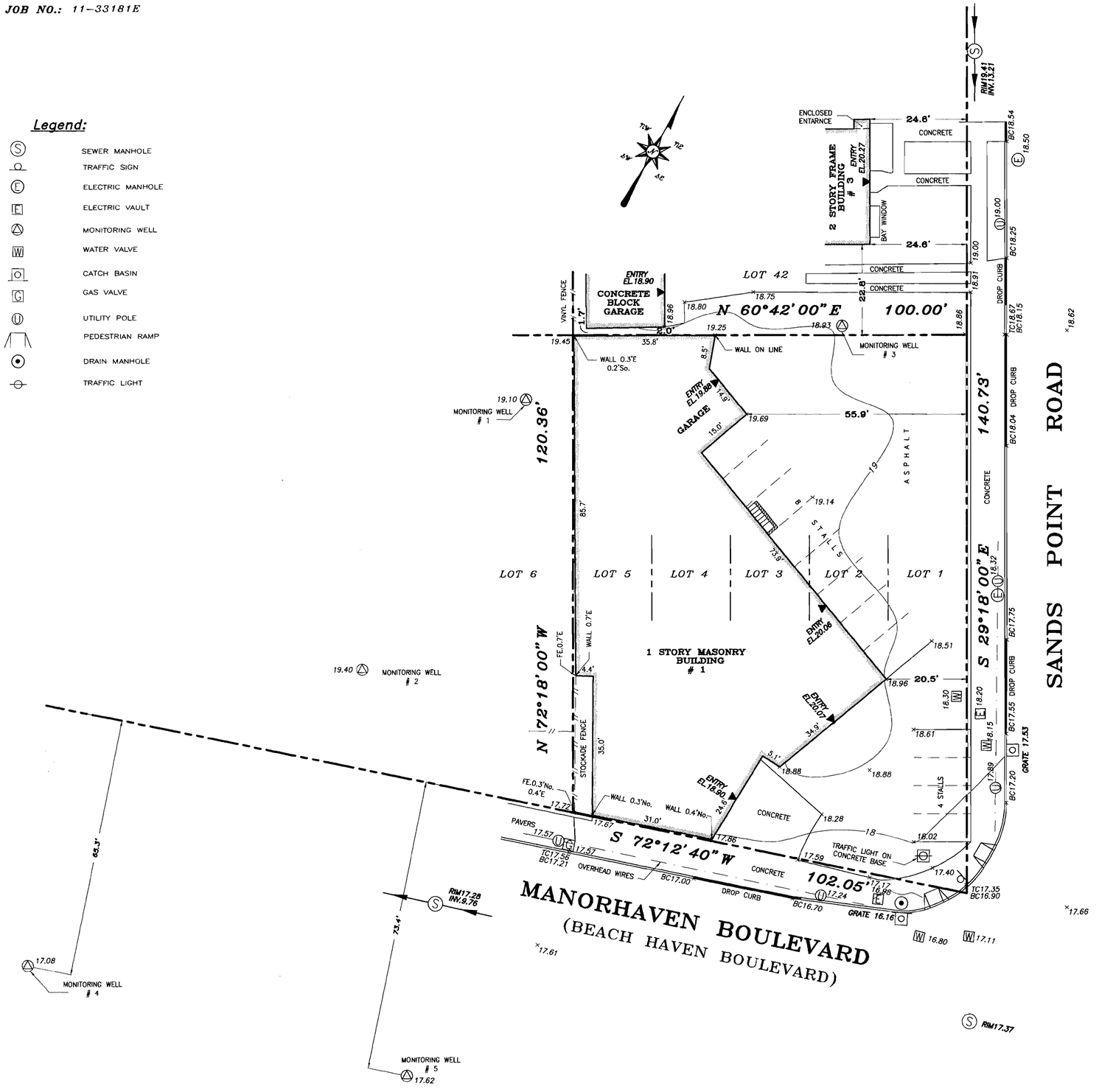
FIGURE 1

12-02-11 1-3M SURVEY

JOB NO.: 11-33181E

Legend:

- (S) SEWER MANHOLE
- TRAFFIC SIGN
- (E) ELECTRIC MANHOLE
- ELECTRIC VAULT
- MONITORING WELL
- (W) WATER VALVE
- CATCH BASIN
- GAS VALVE
- UTILITY POLE
- PEDESTRIAN RAMP
- DRAIN MANHOLE
- TRAFFIC LIGHT



NOTE:
ELEVATION SHOWN HEREON REFER TO THE NGVD 1929 DATUM.

AREA OF THE PARCEL= 13,054.27 SQ.FT.= 0.30 ACRES

MAP of SURVEY

SURVEY OF: *BLOCK: 1, LOTS 1-5*
FILED MAP: *"MAP OF BEACH HEAVEN, SECTION A", FILED ON 09/28/1927 AS AMP No. 893.*

LOCATED AT:

PORT WASHINGTON, TOWN OF No. HEMPSTEAD, COUNTY OF NASSAU, STATE OF NEW YORK

TAX DESIGNATION:

SECTION: 4, BLOCK: 74, LOTS: 1-5

SURVEYED ON: *OCTOBER 21, 2011*
AMENDED ON: *DECEMBER 02, 2011 (ADDITIONAL MONITORING WELLS ADDED)*

CERTIFIED TO: *TOWN OF NORTH HEMPSTEAD.*

DRAWN BY: M.K. CHECKED BY: A.T.

STATE OF NEW YORK
ALEXANDER TSUKERMAN
LICENSED LAND SURVEYOR

ALEXANDER TSUKERMAN N.Y.S. L.S. № 050189

20 0 20 40 60

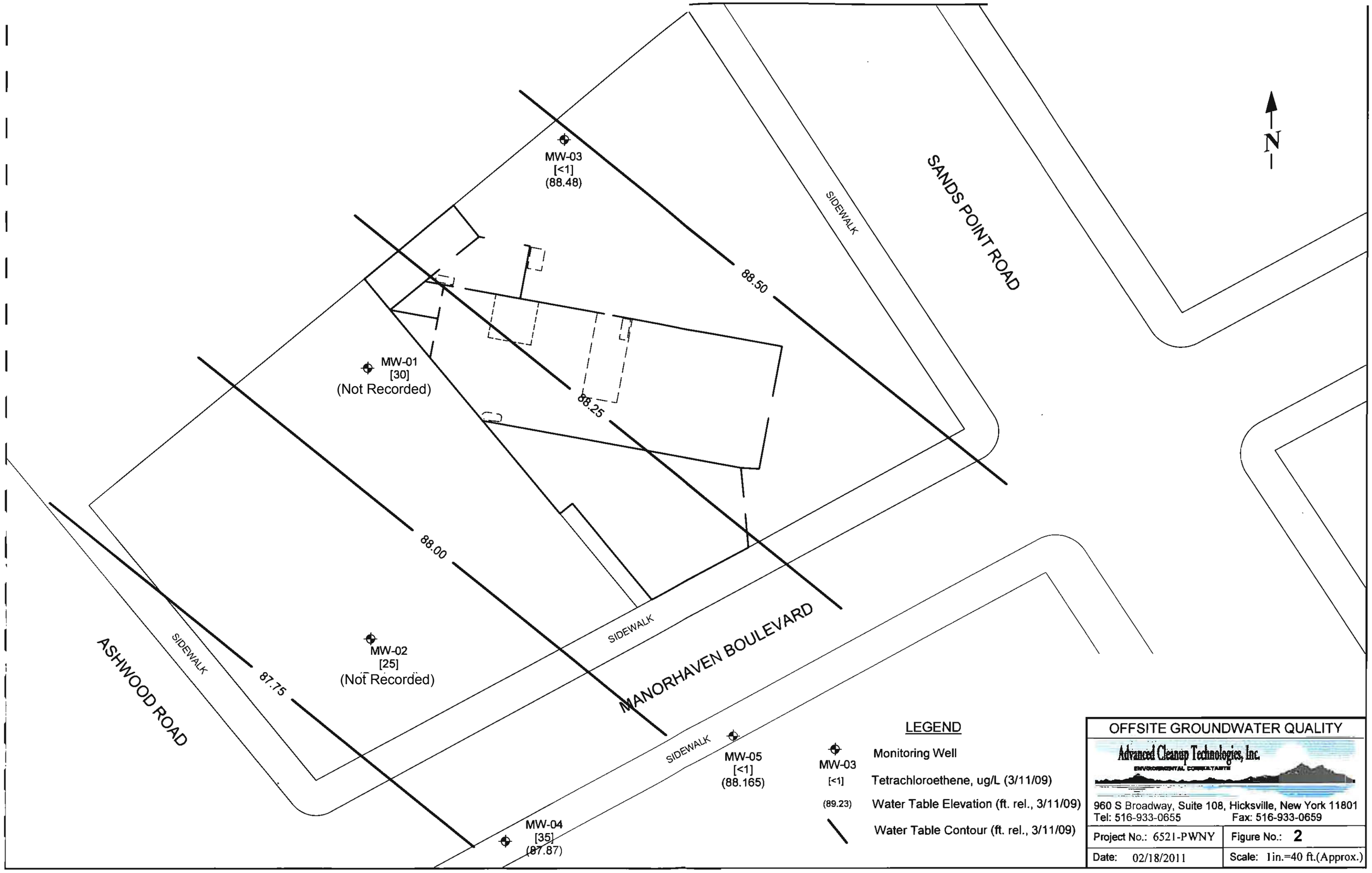
Scale 1" = 20'

THE EXISTENCE OF RIGHT OF WAYS AND/OR EASEMENTS OF RECORD, IF ANY, NOT SHOWN ARE NOT CERTIFIED.

LEONARD J. STRANDBERG AND ASSOCIATES,
CONSULTING ENGINEERS AND LAND SURVEYORS, P.C.
32 SMITH STREET, FREEPORT, NY 11520
516-378-2064 ◦ 212-213-4090 ◦ FAX 516-378-6649
ONE EDGEWATER PLAZA, STATEN ISLAND, NY 10305
Suite 205 ◦ 718-420-9693 ◦ FAX 718-420-9673

FIGURE 2

GROUNDWATER CONTOUR MAP



OFFSITE GROUNDWATER QUALITY

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
960 S Broadway, Suite 108, Hicksville, New York 11801
Tel: 516-933-0655 Fax: 516-933-0659

Project No.: 6521-PWNY	Figure No.: 2
Date: 02/18/2011	Scale: 1in.=40 ft.(Approx.)

FIGURE 3

SOIL QUALITY

SB-07
[<11]

SB-12
[<6.1]

SB-13
[22]

SB-08
[<5.2]

SB-09
[190]

SB-10
[<12]

SB-05
[<5.6]

SB-06
[31]

SB-11
[<5.9]

N

SANDS POINT ROAD

SIDEWALK

SIDEWALK

MANORHAVEN BOULEVARD

LEGEND

● SB-05 Soil Boring(Collected February 10-11, 2009)
[<5.6] Tetrachloroethene, ug/kg

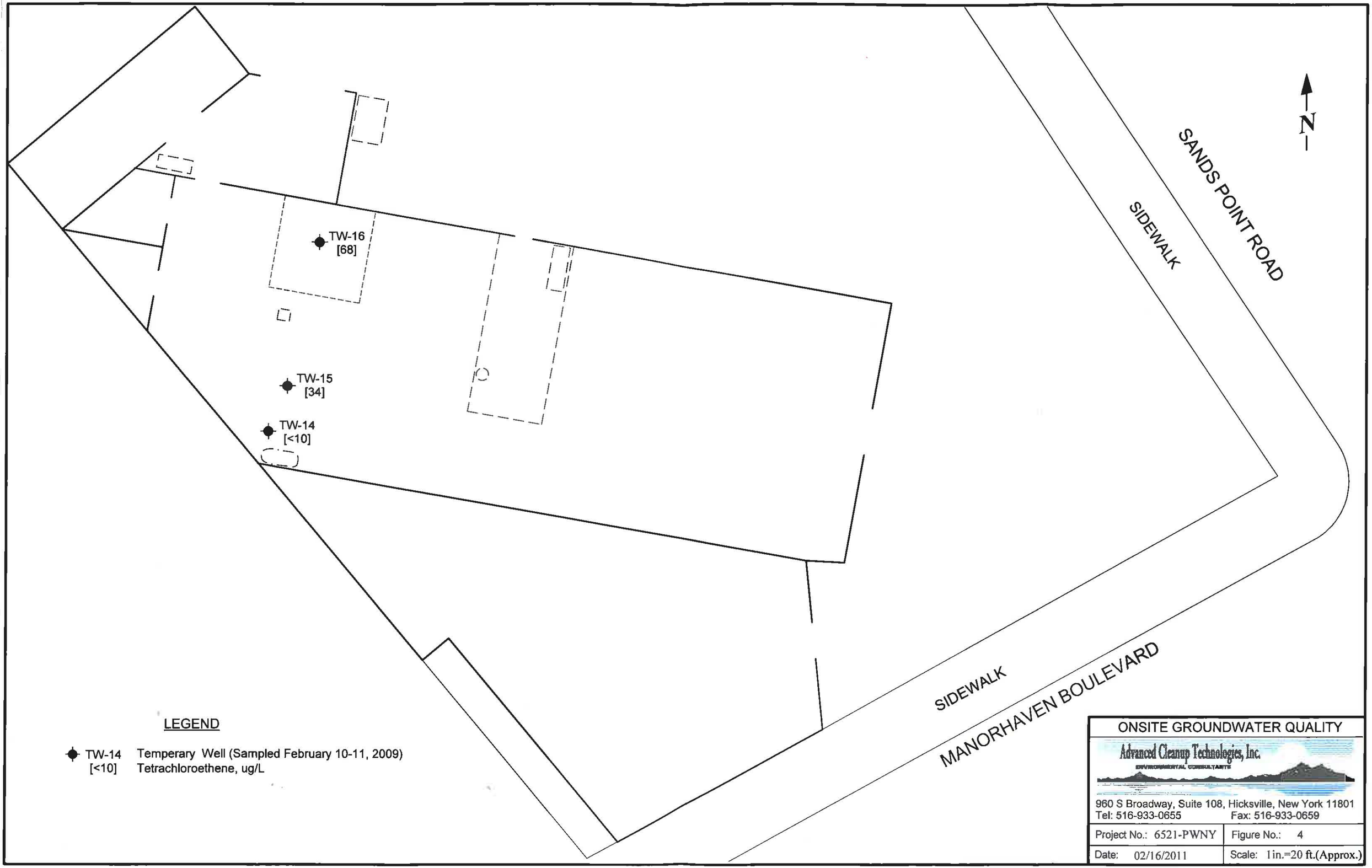
SOIL QUALITY

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
960 S Broadway, Suite 108, Hicksville, New York 11801
Tel: 516-933-0655 Fax: 516-933-0659

Project No.: 6521-PWNY	Figure No.: 3
Date: 02/16/2011	Scale: 1in.=20 ft.(Approx.)

FIGURE 4

ONSITE GROUNDWATER QUALITY



LEGEND

TW-14 Temperary Well (Sampled February 10-11, 2009)
[<10] Tetrachloroethene, ug/L

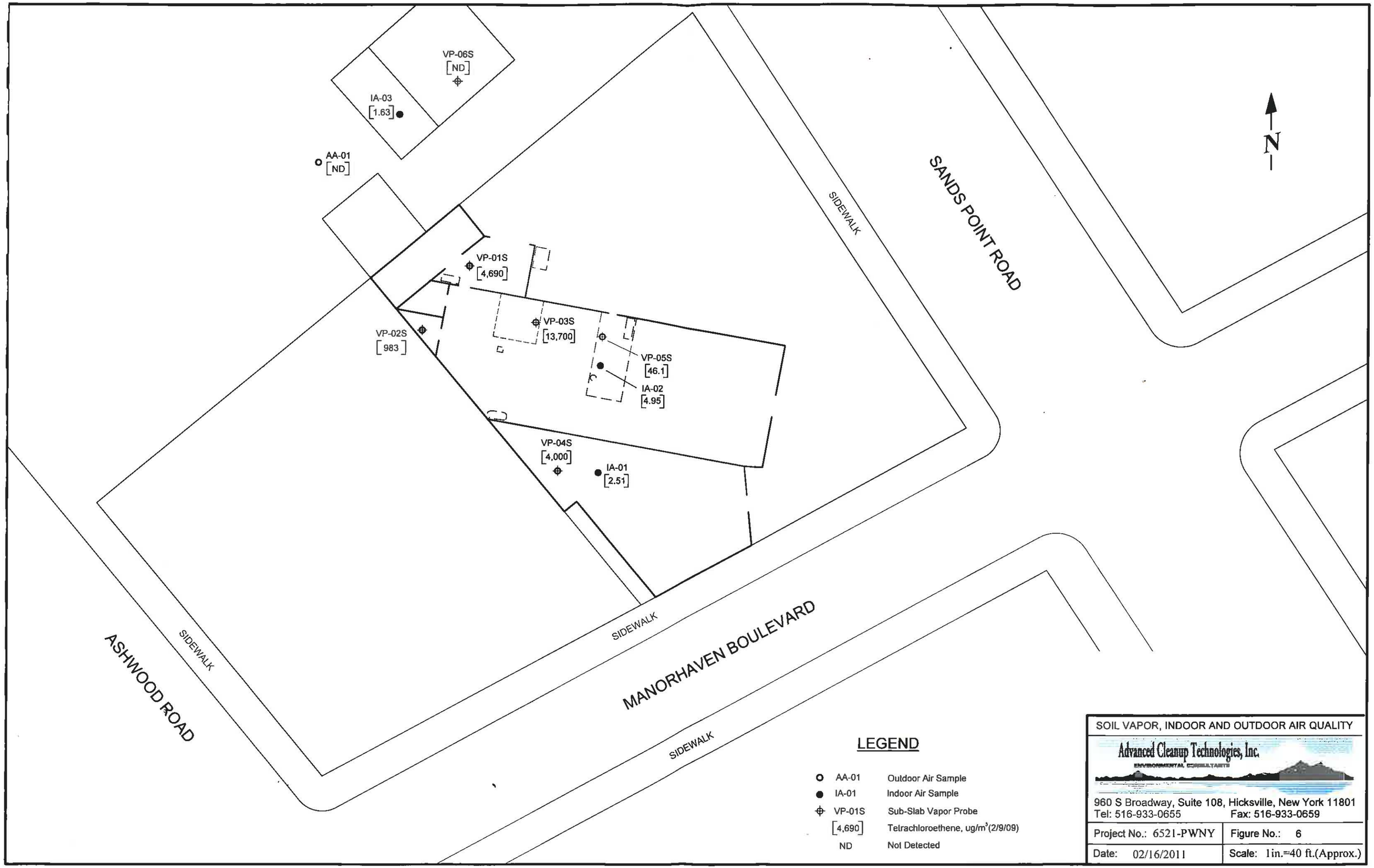
ONSITE GROUNDWATER QUALITY

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
960 S Broadway, Suite 108, Hicksville, New York 11801
Tel: 516-933-0655 Fax: 516-933-0659

Project No.: 6521-PWNY	Figure No.: 4
Date: 02/16/2011	Scale: 1in.=20 ft.(Approx.)

FIGURE 5

SOIL VAPOR, INDOOR AND OUTDOOR AIR QUALITY



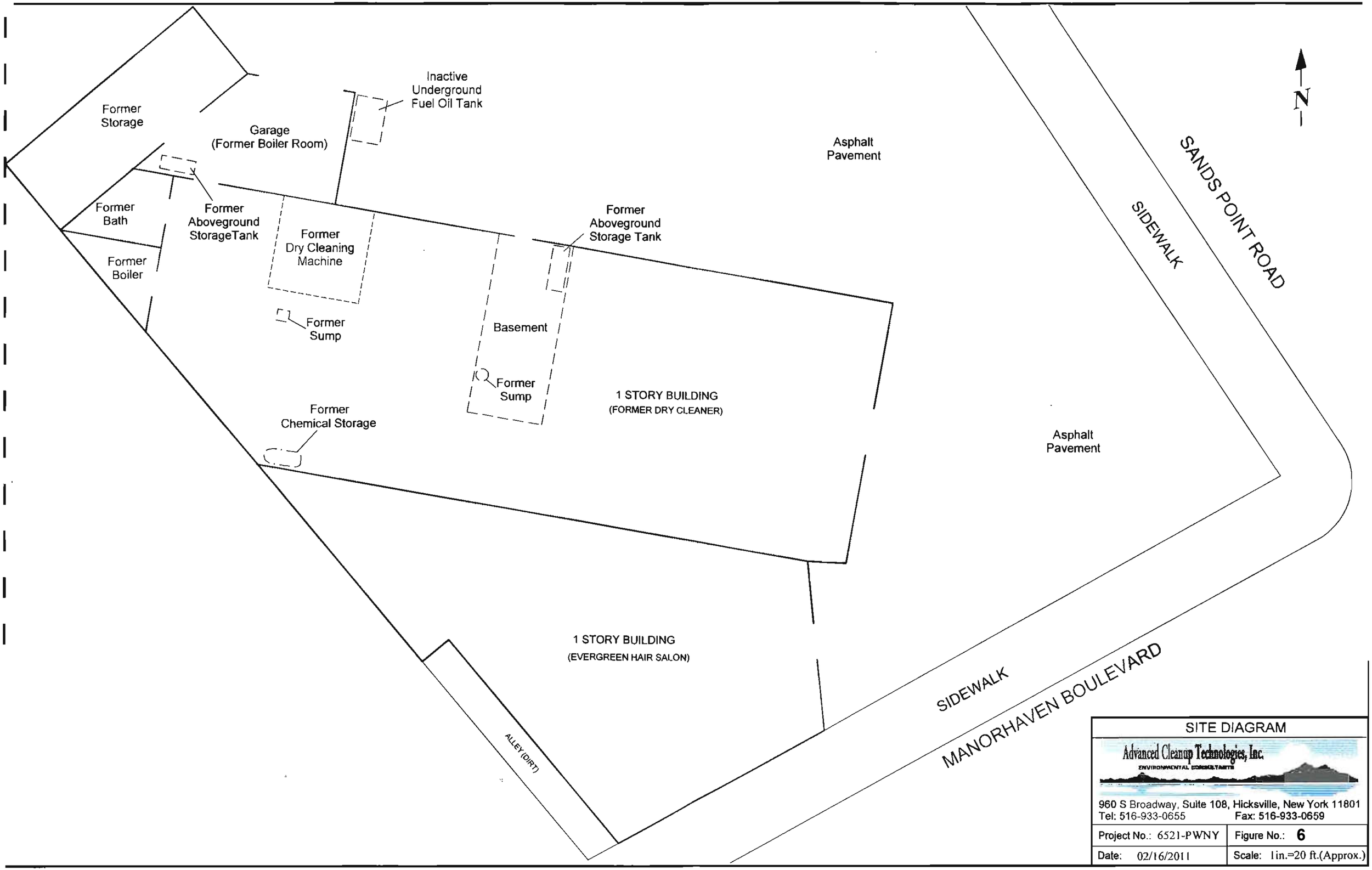
SOIL VAPOR, INDOOR AND OUTDOOR AIR QUALITY

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
960 S Broadway, Suite 108, Hicksville, New York 11801
Tel: 516-933-0655 Fax: 516-933-0659

Project No.: 6521-PWNY	Figure No.: 6
Date: 02/16/2011	Scale: 1in.=40 ft.(Approx.)

FIGURE 6

SITE DIAGRAM



SITE DIAGRAM

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
960 S Broadway, Suite 108, Hicksville, New York 11801
Tel: 516-933-0655 Fax: 516-933-0659

Project No.: 6521-PWNY	Figure No.: 6
Date: 02/16/2011	Scale: 1in.=20 ft.(Approx.)

ATTACHMENT 1

ENVIRONMENTAL EASEMENT

Nassau County
Maureen OConnell
County Clerk
Mineola, NY 11501

60 2017 00024719

Instrument Number: 2017- 00024719
As
D06 - AGREEMENT

Recorded On: March 09, 2017
Parties: PORT MANOR REALTY LLC
TO PEOPLE OF THE STATE OF NY
Recorded By: METROPOLITAN ABST

Billable Pages: 9
Num Of Pages: 10
Comment:

**** Examined and Charged as Follows: ****

D06 - AGREEMENT	90.00	Blocks - Deeds - $300	300.00	Tax Affidavit TP 584	5.00
Recording Charge:	395.00				

	Amount	Consideration Amount	RS#/CS#				
Tax-Transfer	0.00	0.00	RE 16423	Basic	0.00	Spec ASST	0.00
N. HEMPSTEAD				Local NY CITY	0.00	Spec ADDL SONYMA	0.00
				Additional MTA	0.00	Transfer	0.00
Tax Charge:	0.00						

Property Description:

Line	Section	Block	Lot	Unit	Town Name
1	4	74	1		N. HEMPSTEAD
2	4	74	2		N. HEMPSTEAD
3	4	74	3		N. HEMPSTEAD
4	4	74	4		N. HEMPSTEAD
5	4	74	5		N. HEMPSTEAD

**** THIS PAGE IS PART OF THE INSTRUMENT ****

I hereby certify that the within and foregoing was recorded in the Clerk's Office For: Nassau County, NY

File Information:

Document Number: 2017- 00024719
Receipt Number: 576669
Recorded Date/Time: March 09, 2017 11:45:08A
Book-Vol/Pg: Bk-D Vl-13482 Pg-211
Cashier / Station: 0 SDS / NCCL-FLKSFQ1

Record and Return To:

METROPOLITAN ABSTRACT CORP
ONE OLD COUNTRY ROAD
CARLE PLACE NY 11514

NASSAU COUNTY STATE OF NEW YORK

Maureen O'Connell

County Clerk Maureen O'Connell

ACC-25698

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 6th day of JANUARY, 2017, between Owner(s) Port Manor Realty, LLC, having an office at c/o 1-3 Manorhaven Boulevard, Port Washington, New York 11050, County of Nassau, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

S- 4
B- 74
L- 1, 2, 3, 4, 5

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 1-3 Manorhaven Boulvard, Port Washington in the Town of North Hempstead, County of Nassau and State of New York, known and designated on the tax map of the County Clerk of Nassau as tax map parcel numbers: Section 4 Block 74 Lot 1, 2, 3, 4 and 5, being the same as that property conveyed to Grantor by deed dated January 14, 2014 and recorded in the Nassau County Clerk's Office in Liber and Page , liber 13041 at page 909. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.30 +/- acres, and is hereinafter more fully described in the Land Title Survey dated October 21, 2011 and revised on September 30, 2013 prepared by Leonard J. Strandberg and Associates, Consulting Engineers and Land Surveyoirs, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the

protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Order on Consent Index Number: CO 1-20160511-47, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than tbe annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties sball address correspondence to:

Site Number: 130169
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and

communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Port Manor Realty, LLC:

By: _____

Print Name: DONALD MARKOWITZ

Title: PRES Date: 11-1-16

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF Nassau)

On the 1st day of November, in the year 2016, before me, the undersigned, personally appeared Donald Markowitz personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Mary Loria Farruggio
Notary Public - State of New York

MARY LORIA FARRUGGIO
NOTARY PUBLIC-STATE OF NEW YORK
No. 01LO5048561
Qualified in Suffolk County
My Commission Expires August 28, 2017

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 6th day of January, in the year 2017 before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

RHR

Acc- 25698
METROPOLITAN ABSTRACT
CORPORATION
One Old Country Road
Carle Place, New York 11514

S- 4
B- 24
C- 1, 2, 3, 4, 5

SCHEDULE "A" PROPERTY DESCRIPTION

All that Certain plot, piece, or parcel of Land with the buildings and improvements thereon erected, situate, lying and being in the Village of Manorhaven, Town of North Hempstead, County of Nassau, State of New York, being known and designated as Lots Number 1, 2, 3, 4 and 5 in Block 1 as shown on a map entitled: "Map of Beach Haven, Section 'A'", which map was filed in the Nassau County Clerk's Office on Sept. 28, 1927, as Map No. 893, Case No. 2589; which lots are more particularly bounded and described as follows:

BEGINNING at the corner formed by the intersection of the westerly side of Sands Point Road with the northerly side of Manorhaven Blvd.;

RUNNING THENCE: along the northerly side of Manorhaven Blvd ., South 72 degrees 12 minutes 40 seconds West, 102.05 feet;

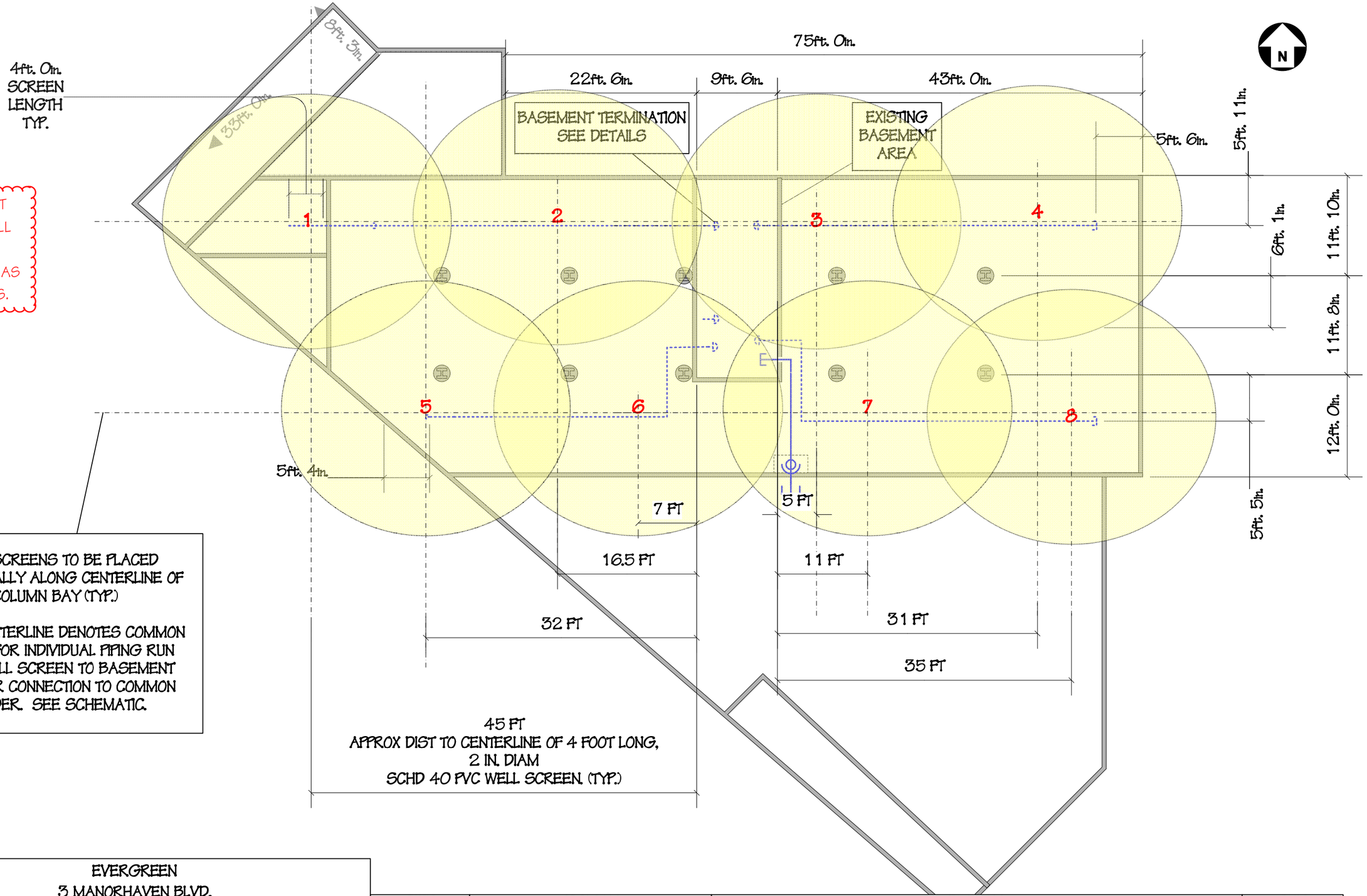
THENCE: North 29 degrees 18 minutes 00 seconds West, 120.36 feet;

THENCE: North 60 degrees 42 minutes 00 seconds East, 100 feet to the westerly side of Sands Point Road;

THENCE: Along the westerly side of Sands Point Road, South 29 degrees 18 minutes 00 seconds East, 140.73 feet to the above referenced corner, the point or place of BEGINNING.

ATTACHMENT 2

AS BUILT DRAWINGS



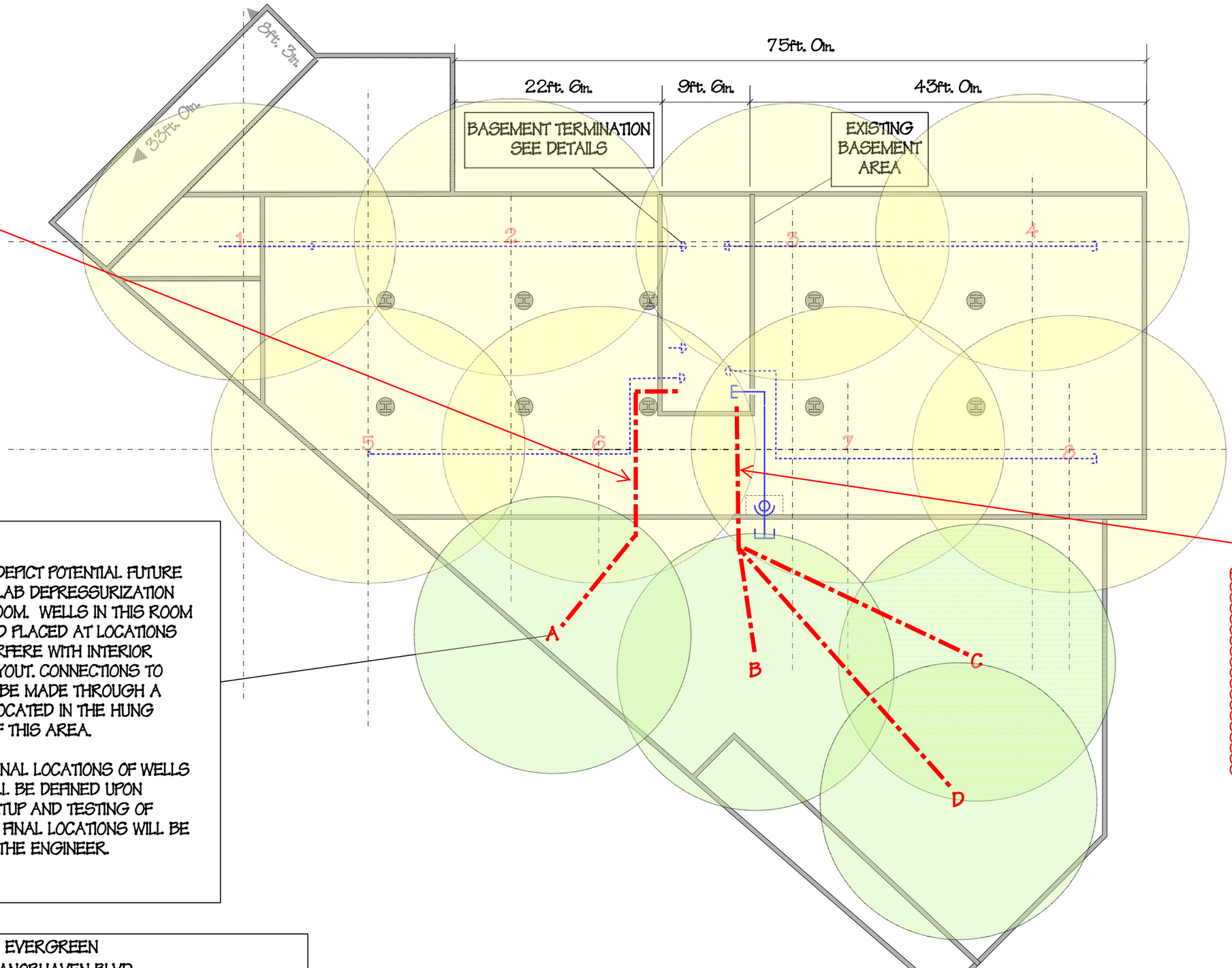
LOCATION OF 4 FT LENGTHS OF WELL SCREENS [1,2,3,4,5,6,7,8] AS SHOWN ON DWGS.

WELL SCREENS TO BE PLACED HORIZONTALLY ALONG CENTERLINE OF COLUMN BAY (TYP.)

NOTE - CENTERLINE DENOTES COMMON TRENCH FOR INDIVIDUAL PIPING RUN FROM WELL SCREEN TO BASEMENT AREA FOR CONNECTION TO COMMON HEADER. SEE SCHEMATIC.

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO SUB-SLAB WELL SCREEN LOCATIONS NORTH ROOM - DIMENSIONS APPROX.	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/13/09	SCALE	SCHEMATIC	SHEET	1 OF 6

NEW 2 INCH DIA LINE RUN TO VERTICAL WELL A. INCLUDES THROTTLING VALVE, PRESSURE GAUGE AND SAMPLE TAP.



THREE SEPERATE 2 IN DIA LINES RUN TO VERTICAL WELLS B, C & D. EACH LINE HAS OWN THROTTLING VALVE PRESSURE GAUGE AND TEST PORT.

R.O.I.S. A, B, C AND D DEPICT POTENTIAL FUTURE LOCATIONS OF SUB-SLAB DEPRESSURIZATION WELLS IN THE SOUTH ROOM. WELLS IN THIS ROOM WILL BE VERTICAL AND PLACED AT LOCATIONS THAT DO NOT INTERFERE WITH INTERIOR ARCHITECTURAL LAYOUT. CONNECTIONS TO THESE WELLS WILL BE MADE THROUGH A PIPING NETWORK LOCATED IN THE HUNG CEILING OF THIS AREA.

FOR OPTIMAL DESIGN, FINAL LOCATIONS OF WELLS IN THIS AREA WILL BE DEFINED UPON COMPLETION, STARTUP AND TESTING OF NORTH ROOM SYSTEM. FINAL LOCATIONS WILL BE DEFINED BY THE ENGINEER.

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO FUTURE SUB-SLAB WELL SCREEN LOCATIONS SOUTH ROOM - DIMENSIONS APPROX.	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/13/09	SCALE	SCHEMATIC	SHEET	1A OF 6

MOUNT ON PLYWOOD TO WALL OF BASEMENT

QUICK DISCONNECT HOSE CONNECTIONS 2 IN DIA. (TYP)

INSIDE FACE CONCRETE BLOCK WALL

2 IN DIA. SCHED 40 PVC THRU WALL TO 2 IN DIA QUICK DISCONNECT

ALL JOINTS GLUED IN FIELD (TYP.)

VAC. GA. 0 TO 100 IN OF H^2O (TYP.)

BALL VALVE FOR BALANCING (TYP)

SAMPLING VALVE BARBED END NEEDLE VALVE, TAP AND THREAD INTO PIPING (TYP)

WELL SCREEN 1

WELL SCREEN 2

WELL SCREEN 5

WELL SCREEN 6

WELL SCREEN 3

WELL SCREEN 4

WELL SCREEN 7

WELL SCREEN 8

FRESH AIR INLET

4 IN DIA SCHED 40 PVC MANIFOLD

4 IN DIA SCHED 40 PVC TO DROP CEILING OF SALON

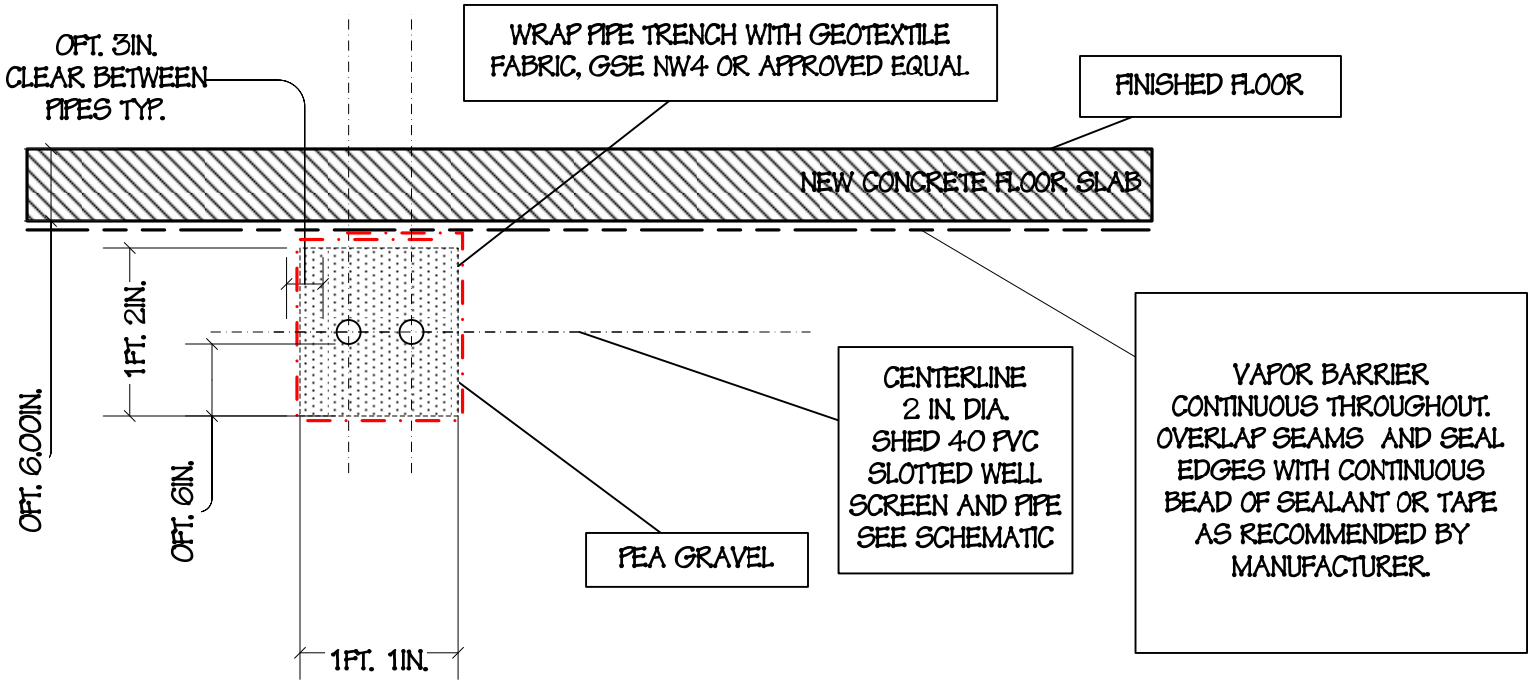
VACUUM BLOWER 150 CFM 100 IN H20

EXHAUST TO ROOF 24 IN. ABOVE HIGHEST FINISHED ELEVATION

CARBON DRUM TYP

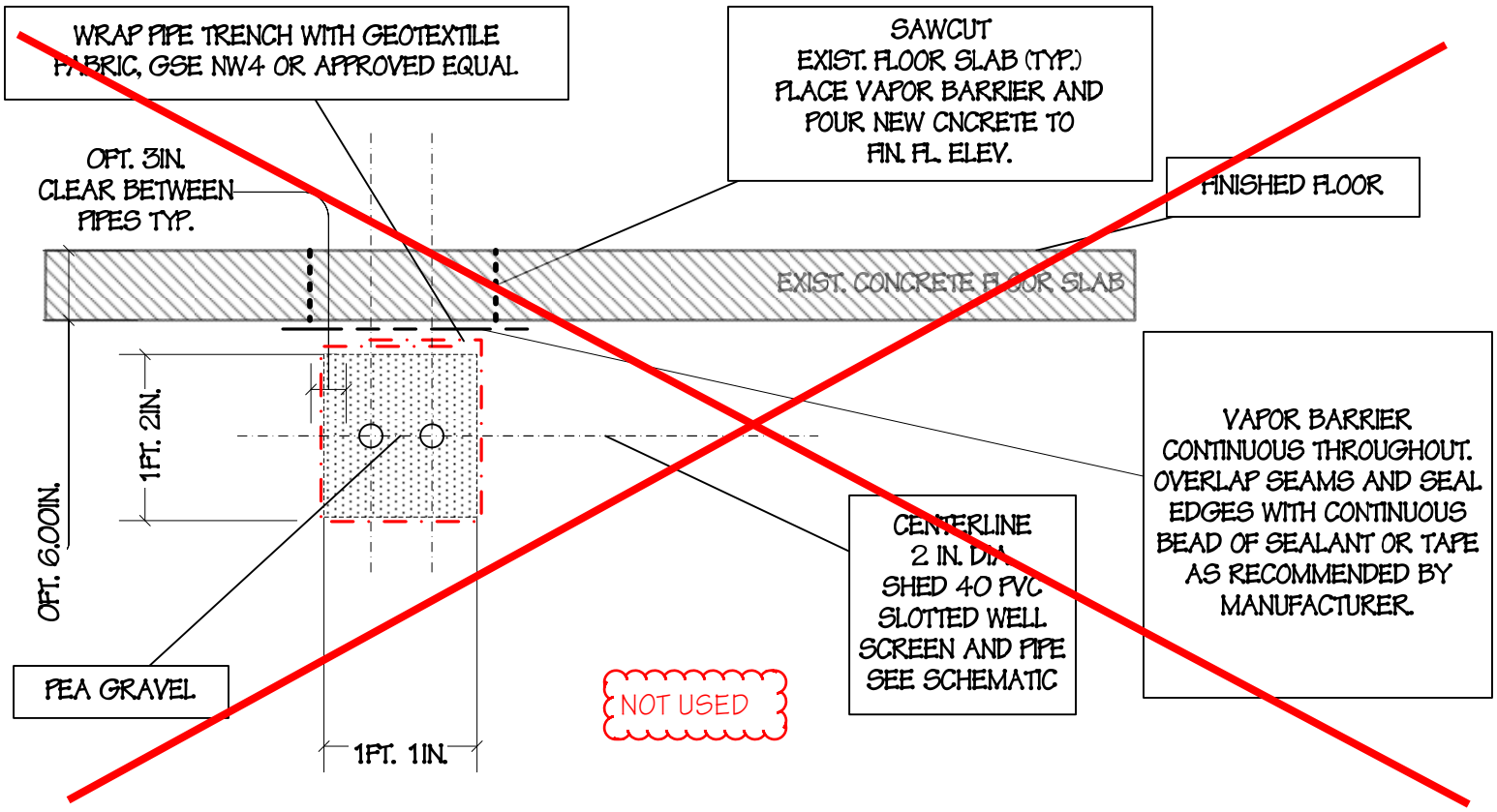
CARBON DRUM TYP

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO SSD/SVE PIPING SCHEMATIC	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/13/09	SCALE	NTS	SHEET	2 OF 6



NEW SLAB INSTALLATION

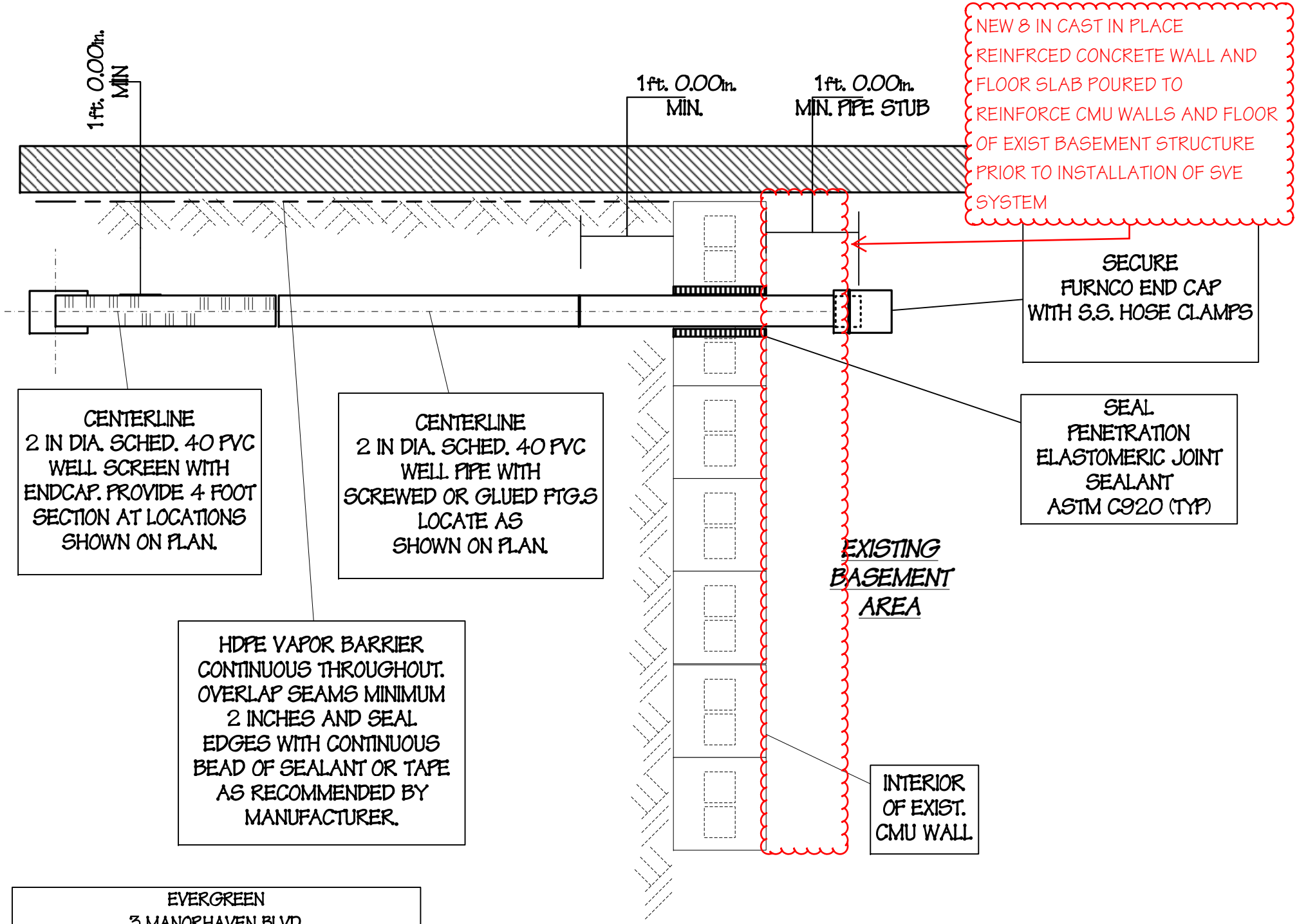
NTS



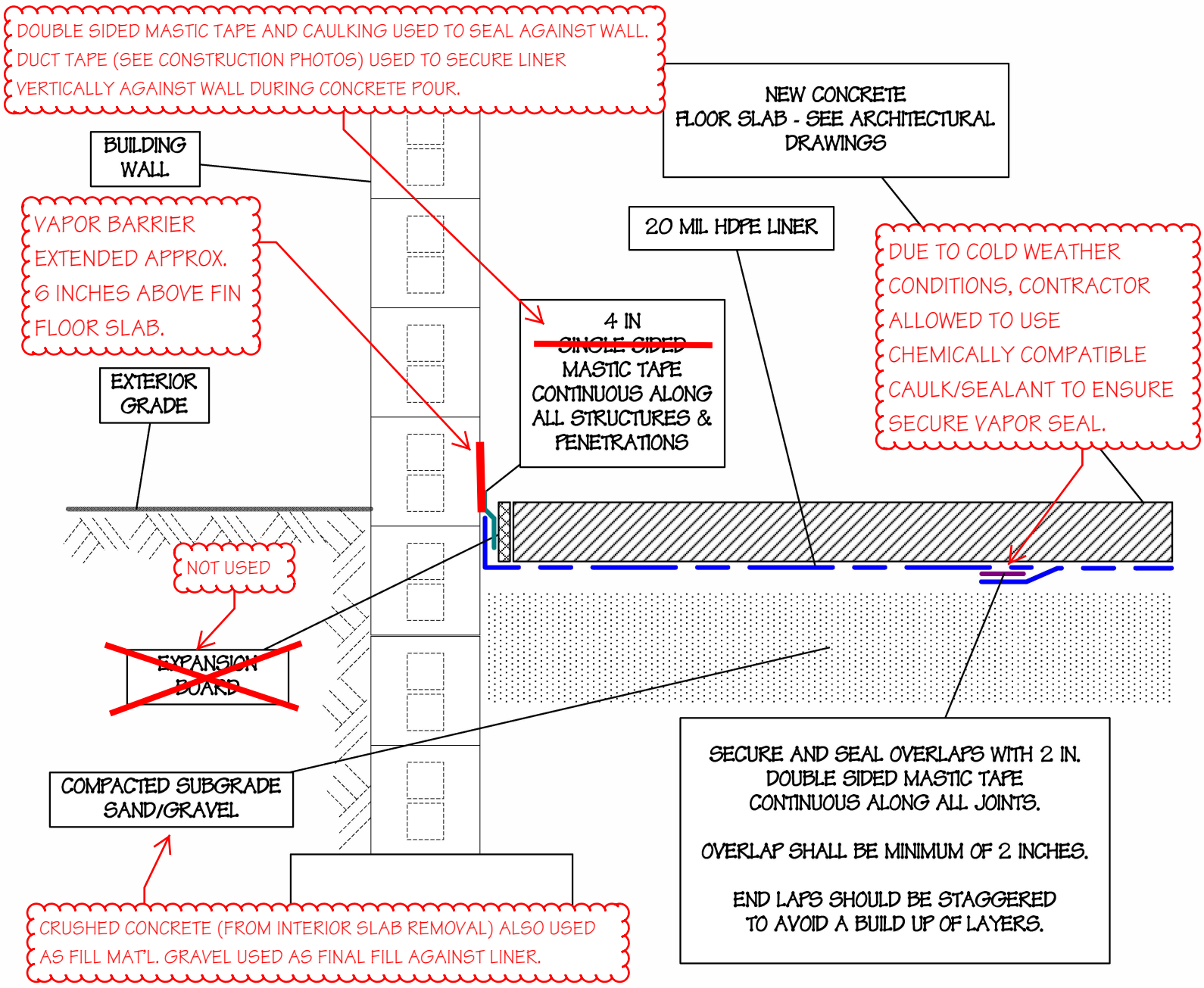
EXISTING SLAB INSTALLATION

NTS

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO TRENCH DETAILS	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/13/09	SCALE	NTS		SHEET 3 OF 6



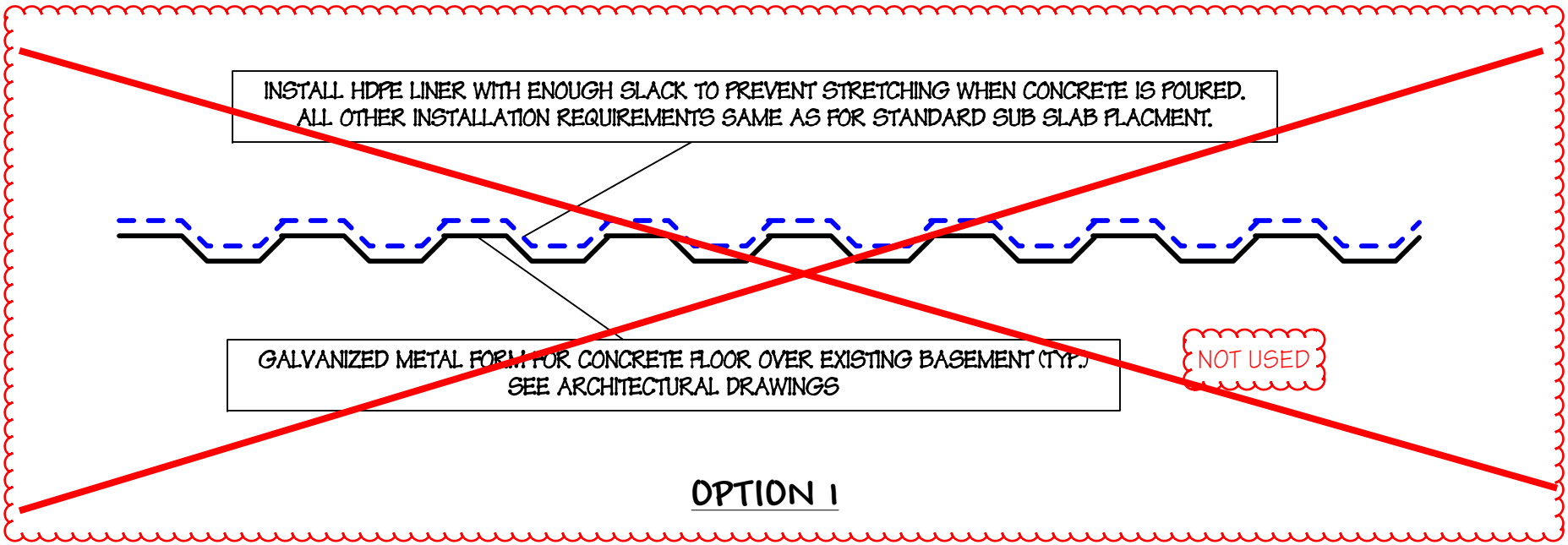
EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO BASEMENT PIPE TERMINATIONS	REV
DRAWN	ANDRIS LEDINS				
ISSUED		SCALE	NTS	SHEET	4 OF 5



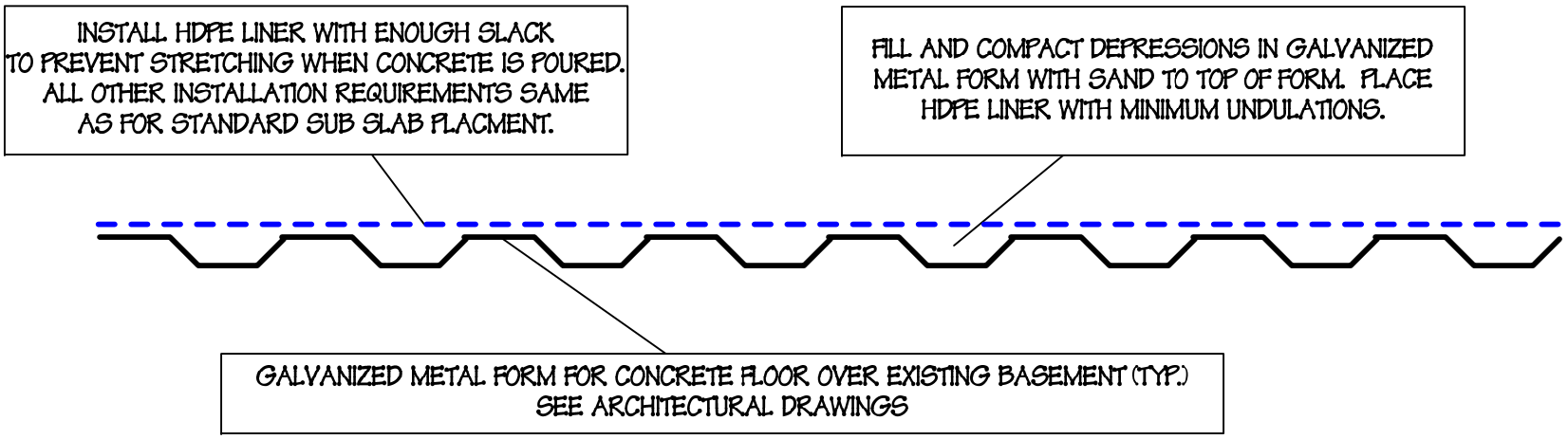
NOTES:

- A 20 MIL HDPE LINER WILL BE USED AS A VAPOR BARRIER BETWEEN THE PERFORATED PIPES AND THE BOTTOM OF THE FOUNDATION FLOOR.
- EARTH AND STONE SUBSTRATES SHALL BE WELL COMPACTED TO PRODUCE AN EVEN, SOLID SUBSTRATE. REMOVE LOOSE AGGREGATE OR SHARP PROTRUSIONS. CONCRETE SUBSTRATES SHALL BE SMOOTH OR BROOM FINISHED AND MONOLITHIC. REMOVE STANDING WATER PRIOR TO MEMBRANE APPLICATIONS.
- INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- THE HDPE LINER WILL BE LAID DOWN IN 20 FT X 50 FT SECTIONS.
- TWO INCH DOUBLE-SIDED BUTYL MASTIC TAPE PROVIDED BY THE LINER MANUFACTURER WILL BE UTILIZED TO ATTACH THE SECTIONS OF VAPOR BARRIER TO EACH OTHER AND TO THE FOUNDATION WALL FOOTINGS.
- A LAYER OF FOUR INCH SINGLE-SIDED MASTIC TAPE WILL BE PLACED OVER THE SEAMS BETWEEN SECTIONS OF HDPE LINER AND ALONG THE FOUNDATION FOOTINGS.
- A SAMPLE OF THE LINER MATERIAL WILL BE PROVIDED ALONG WITH THE DESIGN PLANS FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM.

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO VAPOR BARRIER DETAILS & NOTES	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/14/2009	SCALE	NTS		SHEET 5 OF 6



OPTION 1



OPTION 2

EVERGREEN 3 MANORHAVEN BLVD. SVE/SSD SYSTEM DETAILS		SIZE	FSCM NO	DWG NO VAPOR BARRIER DETAILS & NOTES 2	REV
DRAWN	ANDRIS LEDINS				
ISSUED	4/15/2009	SCALE NTS		SHEET 6 OF 6	

AIRTECH VACUUM
150 SOUTH VAN BRUNT ST.
ENGLEWOOD, NJ 07631
TEL. (201) 569–1173 FAX. (201) 569–1696

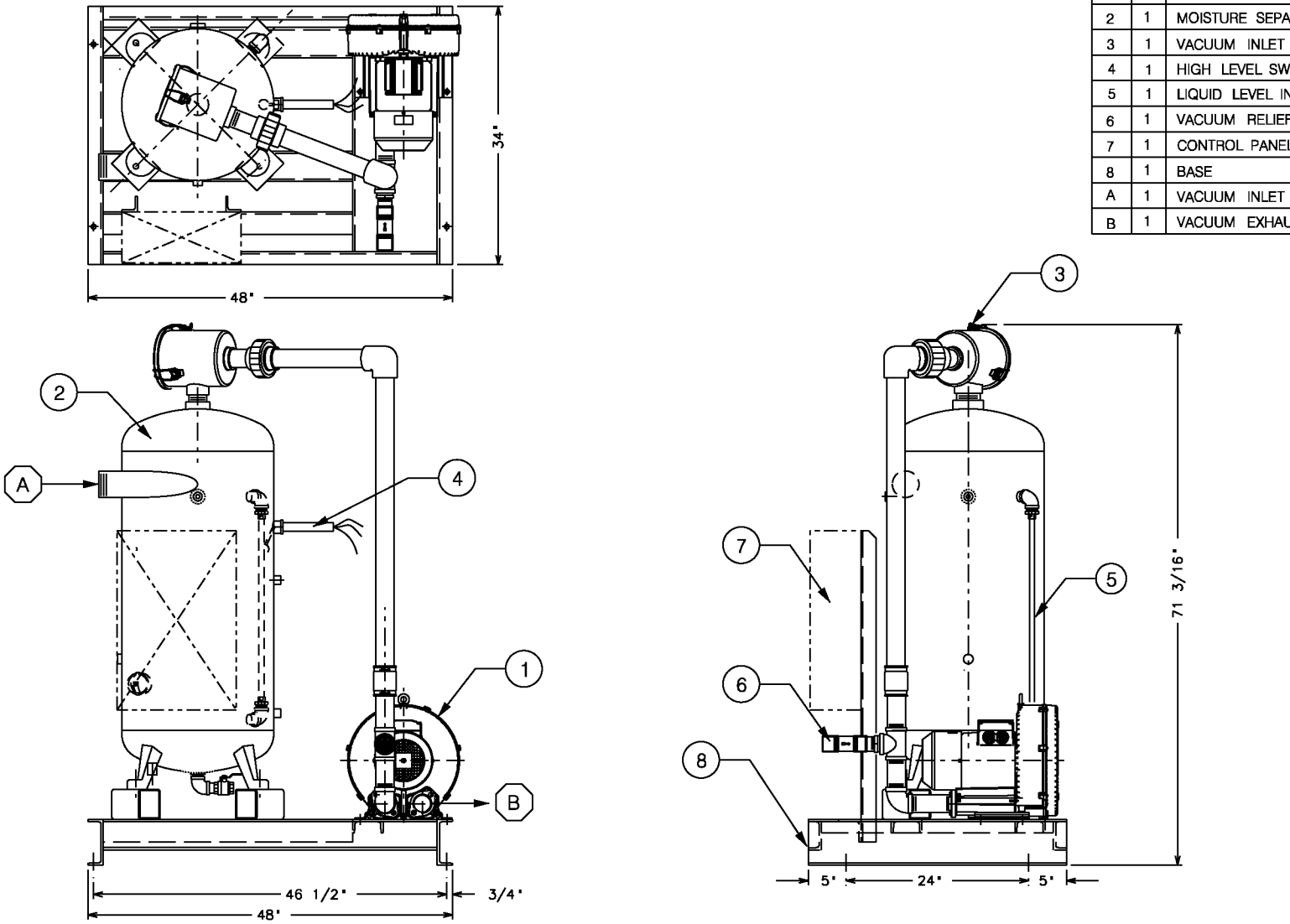
SOIL VAPOR EXTRACTION SYSTEM
1–SVE–1630–6.2

Drawing Ref. No. 927–1

Page 1 of

Effective Date: 8–03–10

ITEM	QTY	DESCRIPTION	SIZE	MODEL
1	1	VACUUM BLOWER	6.2HP	3BA1630–7AT36
2	1	MOISTURE SEPARATOR		60 GAL.
3	1	VACUUM INLET FILTER	2"	ATF–200–850S
4	1	HIGH LEVEL SWITCH		L6EPB–B–S–3–A
5	1	LIQUID LEVEL INDICATOR		
6	1	VACUUM RELIEF VALVE (8.5Hg)	2"	VC81Z
7	1	CONTROL PANEL		
8	1	BASE		
A	1	VACUUM INLET		3" NPT
B	1	VACUUM EXHAUST		2" NPT



Weight:

625 LBS

TYPICAL DIMENSIONS ONLY. NOT TO BE USED FOR CONSTRUCTION WITHOUT CONSULTING FACTORY. SUBJECT TO CHANGE WITHOUT NOTICE.

927–1

AIRTECH® VACUUM

3BA1630

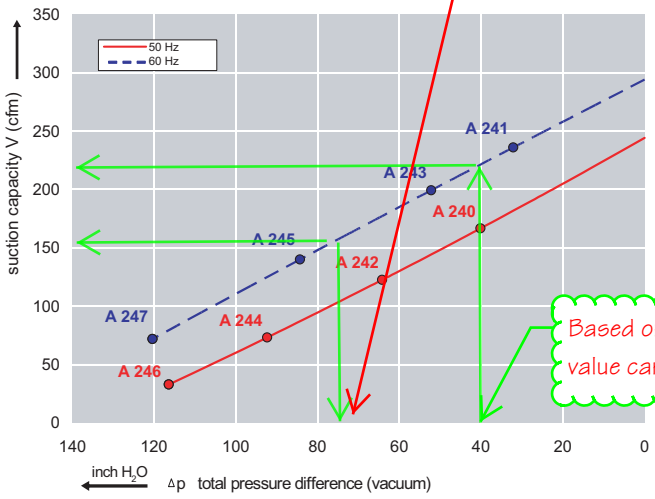
Vacuum/Pressure Regenerative Blower

Features:

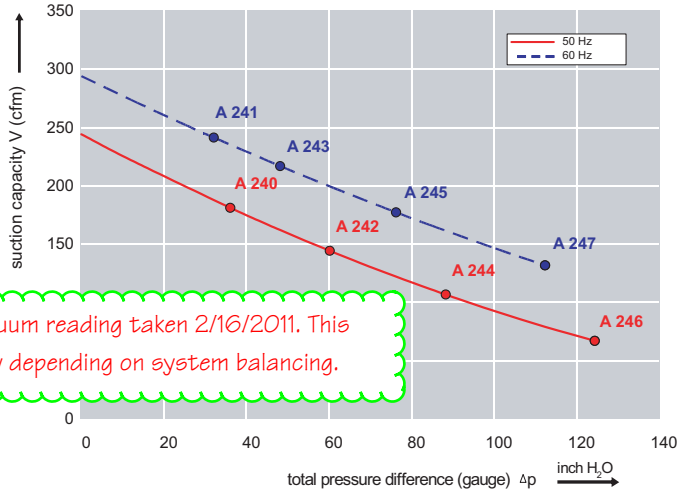
- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
  Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

Based on 4/13/11 site Data

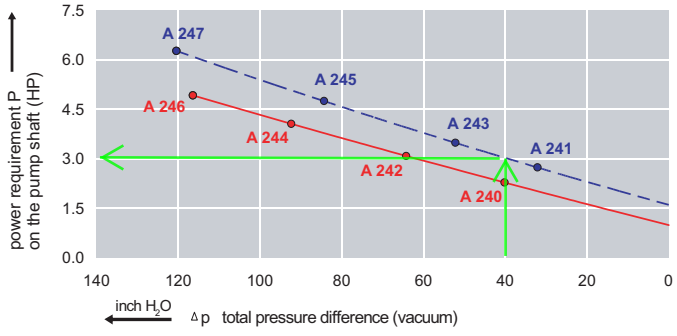
Performance curve for Vacuum pump

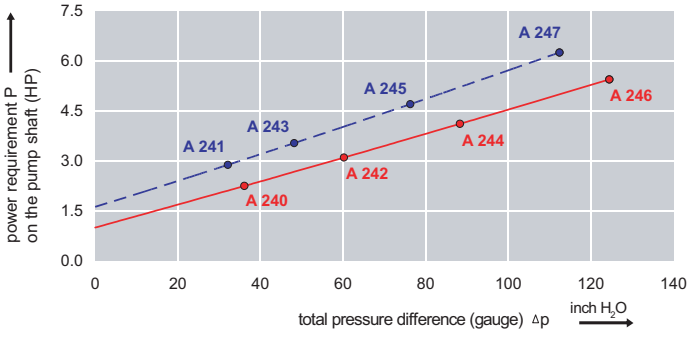


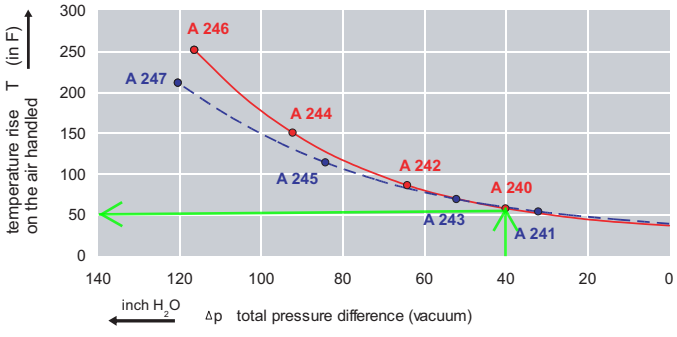
Performance curve for Compressor

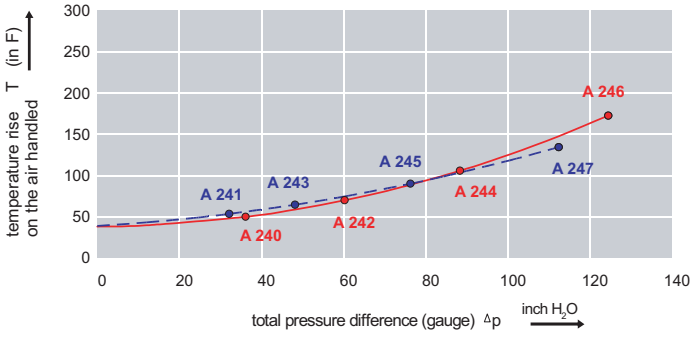


Based on vacuum reading taken 2/16/2011. This value can vary depending on system balancing.







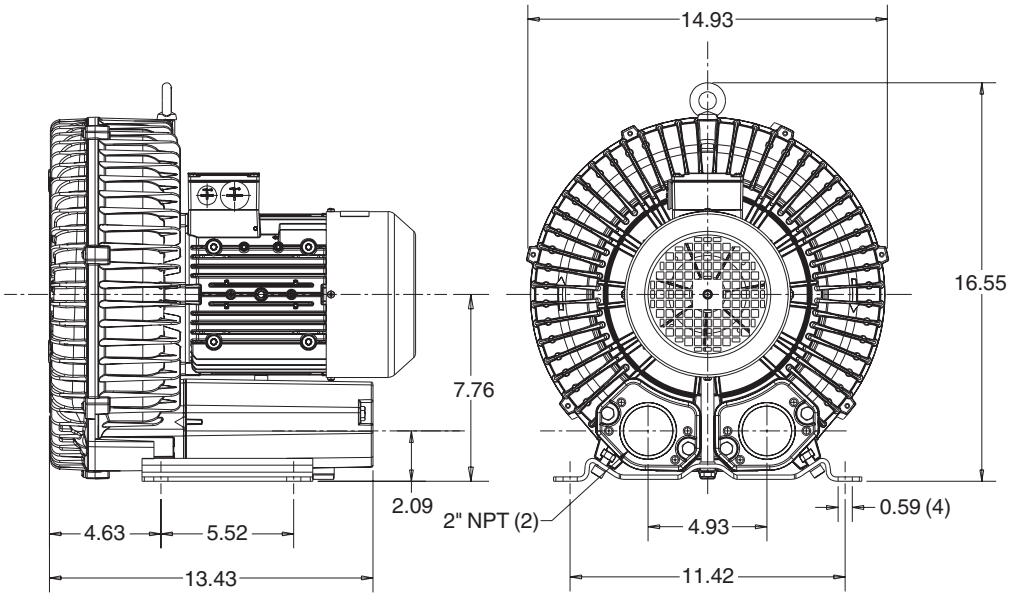


AIRTECH VACUUM

3BA1630

Vacuum/Pressure Regenerative Blower

Dimensions: (inches)



Recommended Accessories:

Relief valve:

VC61Z (Vacuum)

PC61Z (Pressure)

Filter:

ATF-200-15124/1 (Vacuum)

AF-S30-200-10 (Pressure)

Specifications subject to change without notice. Please contact factory for specification updates.

Selection & Ordering Data - Type 3BA1630

Curve No.	Order No.	Frequency Hz	Rated power HP	Input voltage V		Input current A		Permissible total differential pressure Vacuum inch H2O	Permissible total differential pressure Compressor inch H2O	Sound pressure level dB(A)	Weight lbs
3~ 50/60 Hz IP55 insulation material class F											
A 240	3BA1630-7AT06	50	2.14	200D ... 240D	345Y ... 415Y	8.5D	4.9Y	-40	36	70	59
A 241	3BA1630-7AT06	60	2.75	220D ... 250D	415Y ... 460Y	7.5D	4.4Y	-32	32	73	59
A 242	3BA1630-7AT16	50	2.95	200D ... 240D	345Y ... 415Y	9.7D	5.6Y	-64	60	70	66
A 243	3BA1630-7AT16	60	3.42	220D ... 250D	415Y ... 460Y	9.0D	5.3Y	-52	48	73	66
A 244	3BA1630-7AT26	50	4.02	200D ... 240D	345Y ... 415Y	12.5D	7.2Y	-92	88	70	77
A 245	3BA1630-7AT26	60	4.62	220D ... 250D	415Y ... 460Y	12.0D	6.5Y	-84	76	73	77
A 246	3BA1630-7AT36	50	5.36	200D ... 240D	345Y ... 415Y	15.6D	9.0Y	-116	124	70	95
A 247	3BA1630-7AT36	60	6.17	220D ... 250D	415Y ... 460Y	15.2D	8.5Y	-120	112	73	95

Suitable for 208 Volt Operation

All curves are rated at 14.7 psia and 68˚ F ambient conditions and are reported in SCFM referenced to 68˚ F and 14.696 psia sea level conditions. Curve values are nominal, actual performance may vary by up to 10% of the values indicated. For inlet temperatures above approximately 80˚ F or for handling gases other than air, please contact your Airtech sales representative for assistance.

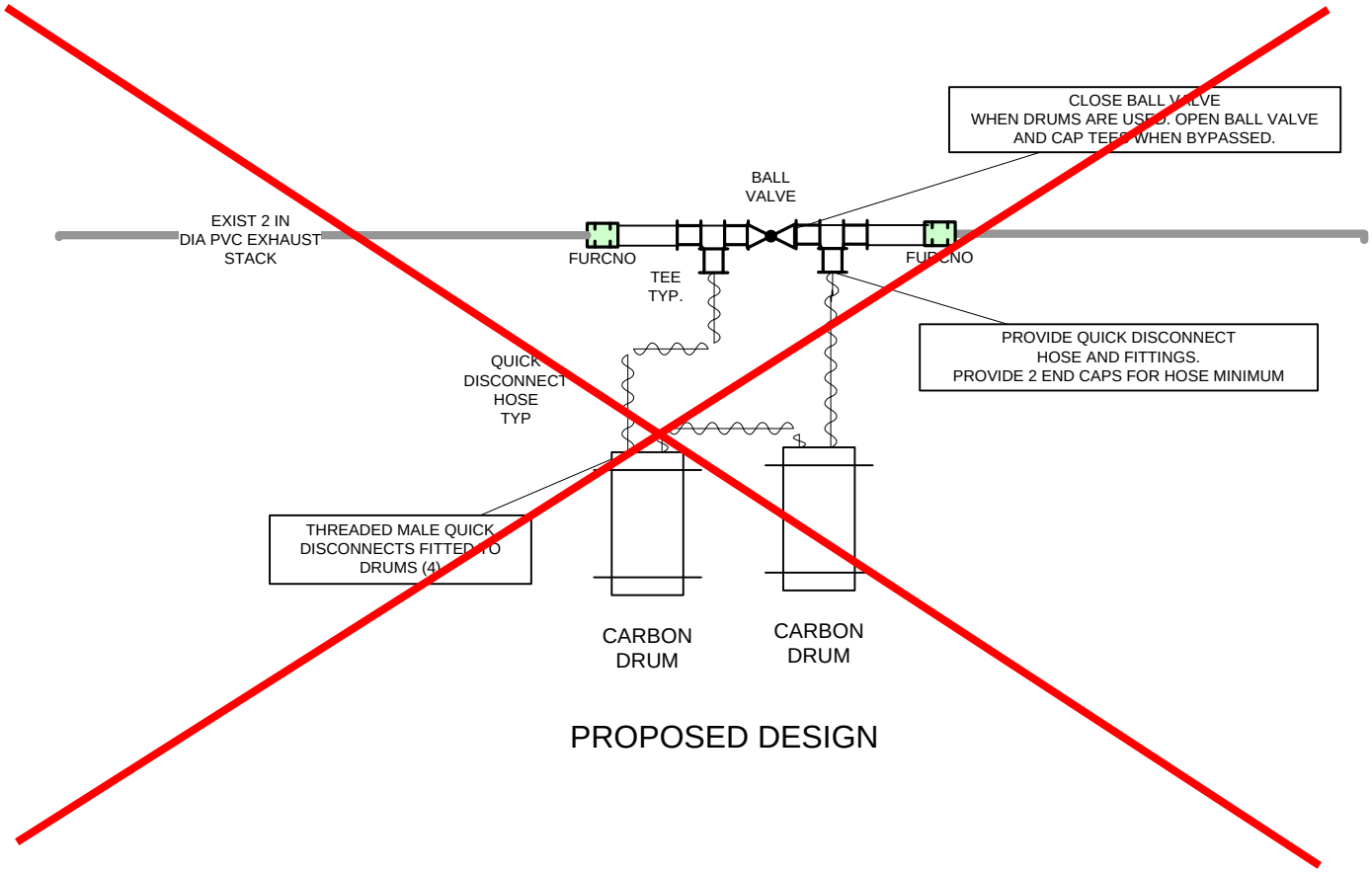
3BA1-3BA7
HIGH VACUUM-PRESSURE REGENERATIVE BLOWERS

3BA1 SERIES

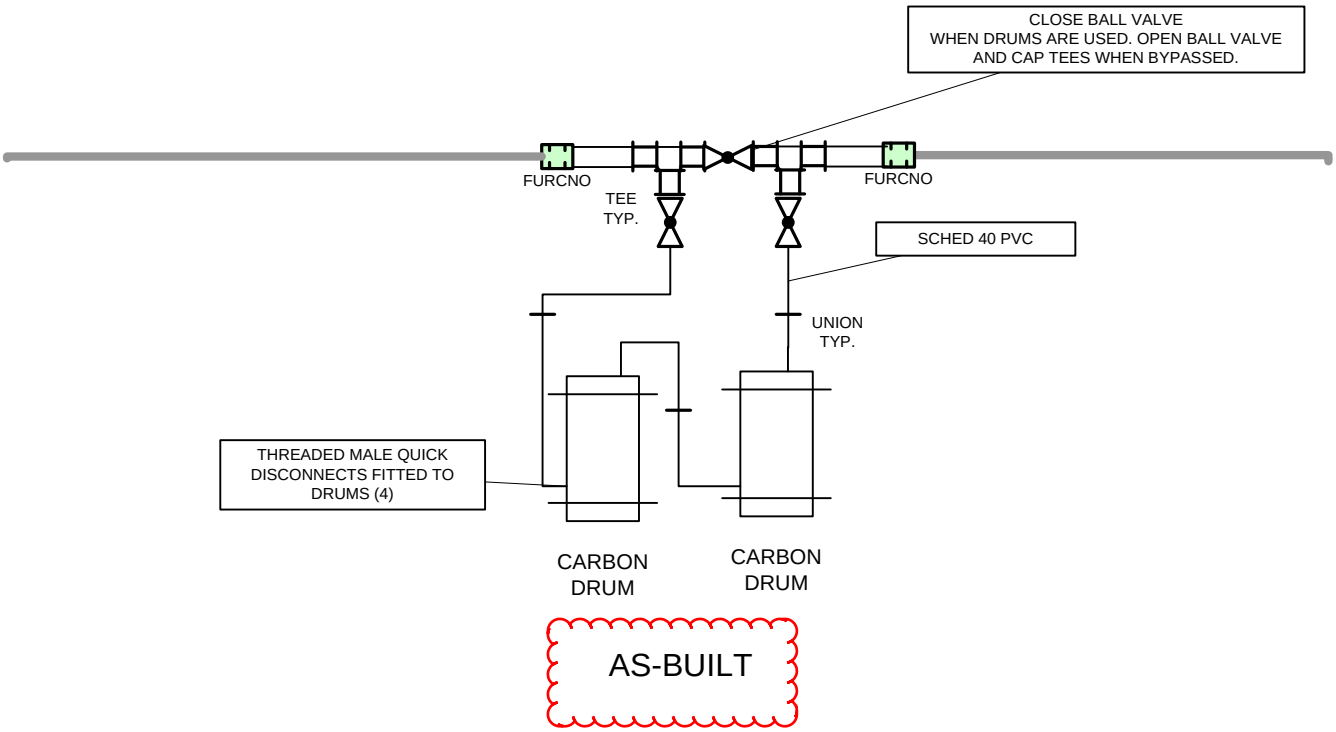
BLOWER MODEL	MAXIMUM FLOW CFM	MAXIMUM VACUUM In. H20	MAXIMUM PRESSURE In. H20
3BA1100	30	30	32
3BA1200	35	32	36
3BA1300	60	60	65
3BA1310	60	100	100
3BA1330	74	65	72
3BA1400	105	85	30
3BA1410	105	140	170
3BA1500	150	105	115
3BA1510	150	165	195
3BA1600	220	135	135
3BA1610	225	185	265
3BA1630	300	120	110
3BA1640	350	110	120
3BA1800	350	140	160
3BA1810	350	200	300
3BA1830	500	110	105
3BA1900	780	155	170
3BA1910	780	180	220
3BA1930	930	120	110
3BA1943	1440	125	95

3BA7 SERIES

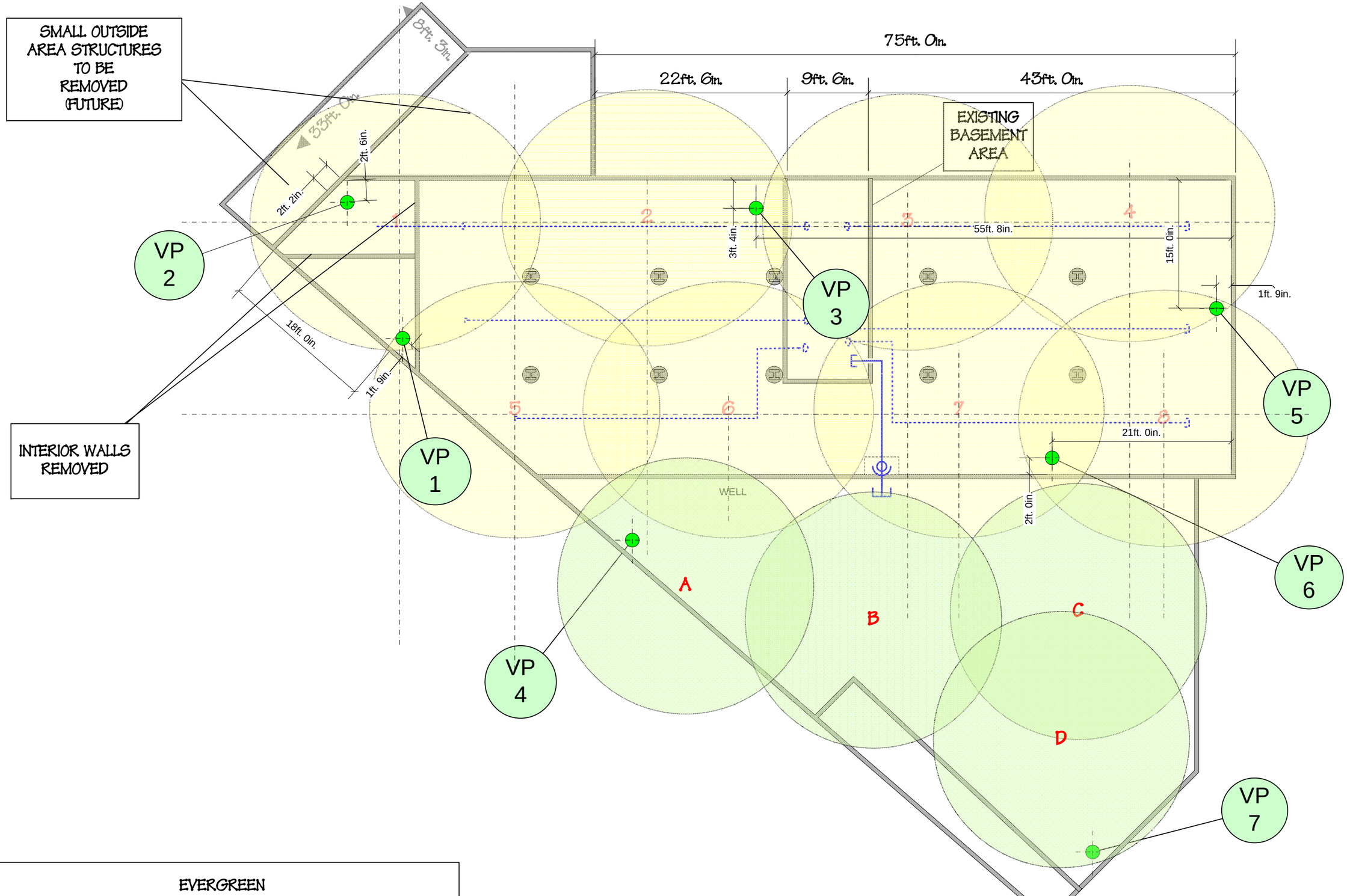
BLOWER MODEL	MAXIMUM FLOW CFM	MAXIMUM VACUUM In. H20	MAXIMUM PRESSURE In. H20
3BA7210	35	110	140
3BA7220	35	200	295
3BA7310	50	135	160
3BA7320	50	225	240
3BA7410	62	140	160
3BA7420	62	205	320
3BA7510	88	145	190
3BA7520	88	215	325
3BA7610	120	155	215
3BA7620	120	195	320
3BA7630	120	260	420



PROPOSED DESIGN



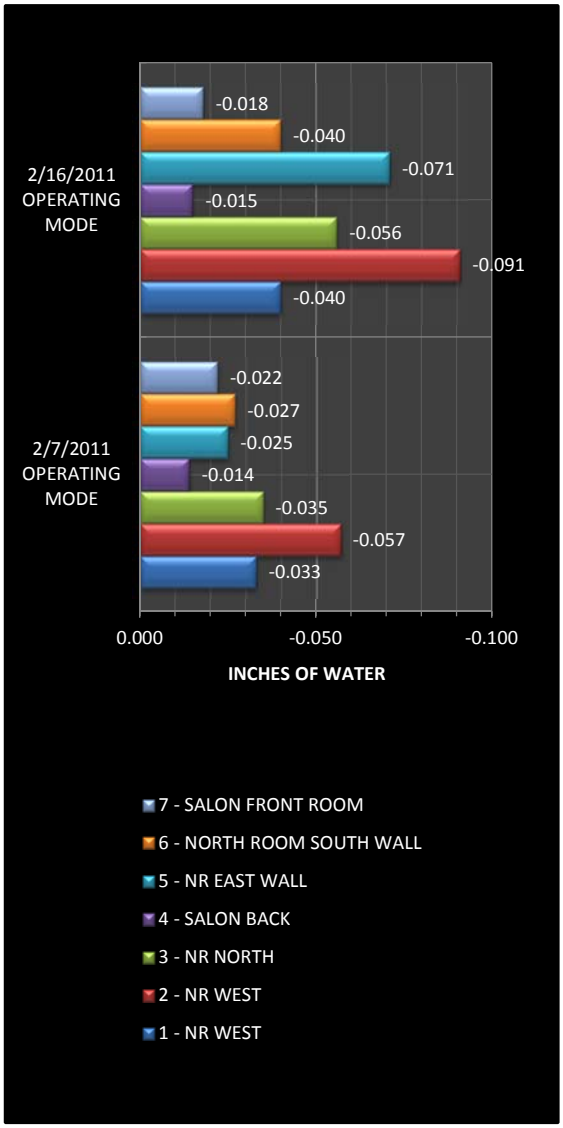
AS-BUILT



EVERGREEN 3 MANORHAVEN BLVD.		SIZE	FSCM NO	DWG NO EXISTING VAPOR POINT LOCATIONS	REV
DRAWN	ANDRIS LEDINS				
ISSUED	2/8/11	SCALE	SCHEMATIC	SHEET	1A OF 6

VACUUM MEASUREMENTS AT VAPOR POINTS
(Inches of Water)

Vapor Point Designation	Location		2/7/2011 OPERATING MODE C (vert well) closed all other Salon wells open wide. North room all valves open very small amount.	2/16/2011 OPERATING MODE ALL WELLS ONLINE
1 - NR WEST	NORTH ROOM		-0.033	-0.040
2 - NR WEST	NORTH ROOM		-0.057	-0.091
3 - NR NORTH	NORTH ROOM		-0.035	-0.056
4 - SALON BACK	S - BACK		-0.014	-0.015
5 - NR EAST WALL	NORTH ROOM		-0.025	-0.071
6 - NORTH ROOM SOUTH WALL	NORTH ROOM		-0.027	-0.040
7 - SALON FRONT ROOM	S -FRONT		-0.022	-0.018

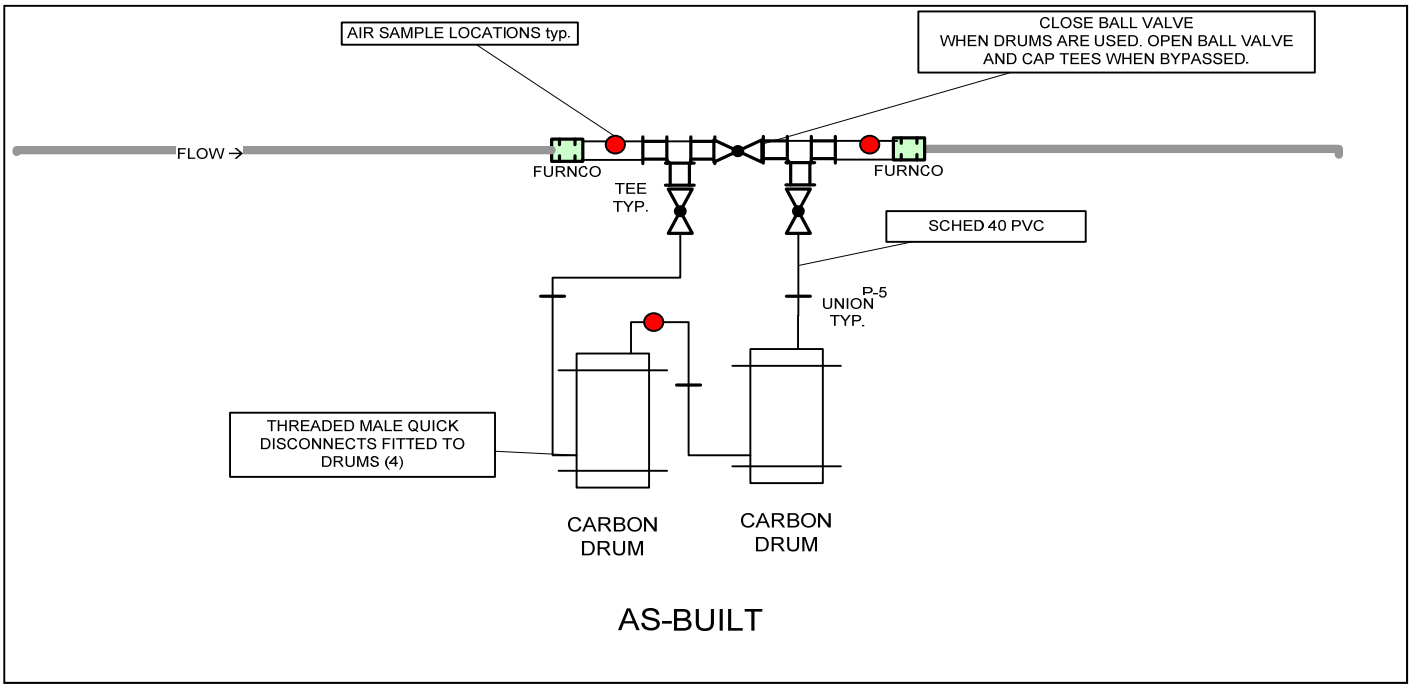


-0.121	LESS THAN -0.024
-0.001	GREATER THAN -0.004

NR = NORTH ROOM
S = SALON

CHEZ VALET

AIR SAMPLING @ CARBON DRUMS



	PPM TVOC (FIELD MEASURED U.O.N.)				
DATE	CARBON IN	BETWEEN DRUMS	POST	BYPASS MODE	NOTES
1/7/2011	2.2	7.1	4.8	2.6	BYPASS = WITH CARBON DRUMS OFF LINE
1/7/2011			6.4		SUSPECT HIGHER READINGS DUE TO RECENTLY GLUED PVC JOINTS.
1/7/2011					SUMMA CANISTERS TAKEN BEFORE AND AFTER CARBON

ATTACHMENT 3

MONITORING WELL INFORMATION

APPENDIX A

SOIL BORING LOGS AND
WELL CONSTRUCTION RECORDS

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: ***SB-05***
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1	Sump				
2	Concrete				
3	Orange, tan and brown medium coarse sand with pebbles		0.0	50	
4					
5					
6	Orange, tan and brown medium coarse sand with pebbles	9'	0.0	75	
7					
8					
9					
10					
11	Orange, tan and brown medium coarse sand with pebbles				End of boring
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Boring No: ***SB-06***
Date Drilled: 2/11/2009
Geologist: Steven Walls
Static Water Table Level: Not Encountered

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0	Dark brown medium very coarse sand with pebbles	0-6"	0.0	100	End of boring
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***
Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: *SB-07*
Date Drilled: 2/11/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1					
2	Orange and brown medium very coarse sand with pebbles		0.0	50	
3					
4					
5					
6					
7					
8	Orange and brown medium very coarse sand with pebbles		0.0	73	
9		9'			wet
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: ***SB-08***
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1		1'	0.0		
2					
3	Orange and brown medium very coarse sand with pebbles		0.0	50	no odor
4					
5					
6					
7					
8	Orange and brown medium very coarse sand with pebbles		0.0	73	no odor
9					
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: *SB-09*
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1					
2	Orange and brown medium very coarse sand with pebbles		0.0	50	No odor
3					
4					
5					
6					
7					
8	Orange and brown medium very coarse sand with pebbles		0.0	73	No odor
9		9'			
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: ***SB-10***
Date Drilled: 2/11/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0	Dark brown medium very coarse sand with pebbles	0-6"	0.0	100	End of boring No odor
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: ***SB-11***
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1					
2	Orange and brown medium coarse sand with pebbles		0.0	50	No odor
3					
4					
5					
6					
7					
8					
9	Orange and brown medium coarse sand with pebbles	8.5'	0.0	82	No odor
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: ***SB-12***
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0	0-6" with Orange and brown medium coarse sand				0-1' fill 2 dark layers
1					
2					
3					
4	6"-10.5' orange and brown medium. very coarse sand with pebbles		0.0	30	No odor
5					
6					
7					
8	Orange and brown medium very coarse sand with pebbles		0.0	83	No odor
9		9'			small area fo black staining
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

SOIL BORING LOG

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

Project No: 5621-PWNY
Site: 1-3 Manorhaven Blvd. Port Washington, NY
Client: Southampton Masonry Tools, LLC
Static Water Table Level: Not Encountered

Boring No: *SB-13*
Date Drilled: 2/10/2009
Geologist: Steven Walls

Depth (feet)	Description	Sample Depth	PID (ppmv)	% Recovery	Remarks
0					
1					
2	Orange and brown medium very coarse sand with pebbles		0.0	50	No odor
3					
4					
5					
6					
7					
8	Orange and brown medium very coarse sand with pebbles	8-9'	0.0	73	No odor
9					
10					
					End of boring
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Rig Type: ***AMS Power Probe***
Driller: ***ACT - Steven Walls***

Reviewed by: ***Paul Stewart***
Sheet No: **1 of 1**

WELL CONSTRUCTION LOG

SITE 1-3 Manorhaven Blvd Port Washington, NY JOB NO. 561-PWNY WELL NO. MW-03

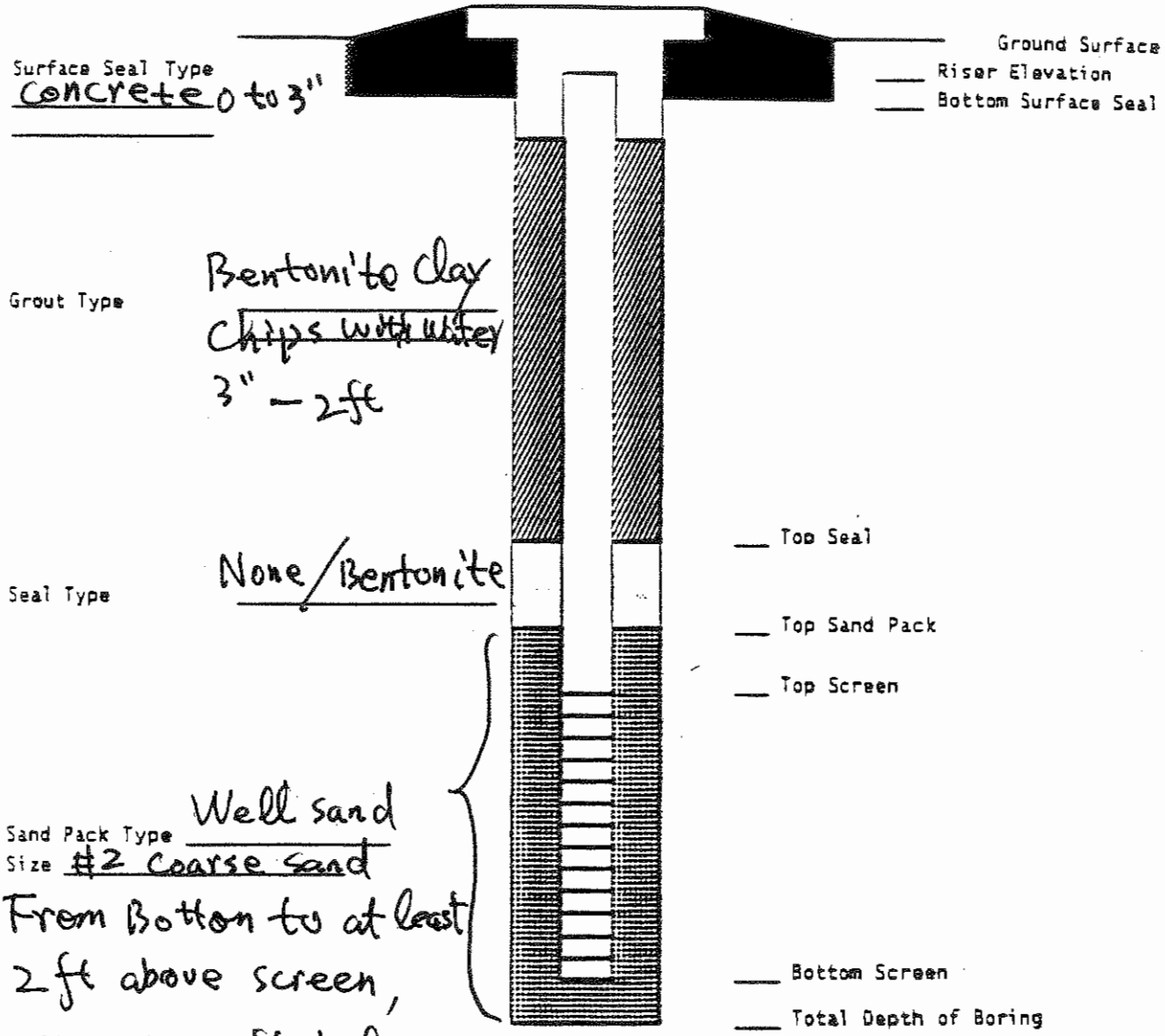
TOTAL DEPTH 15ft SURFACE ELEV. _____ TOP RISER ELEV. _____

WATER LEVELS (DEPTH, DATE, TIME) 7-8'ft 03/09/09 DATE INSTALLED _____

RISER DIA 1" MATERIAL PVC LENGTH 5 ft

SCREEN DIA 1" MATERIAL PVC LENGTH 10 ft SLOT SIZE .02"

SCHEMATIC



1-3 Manorhaven Blvd WELL CONSTRUCTION LOG

SITE Port Washington JOB NO. #5621-PWNY WELL NO. MW-04

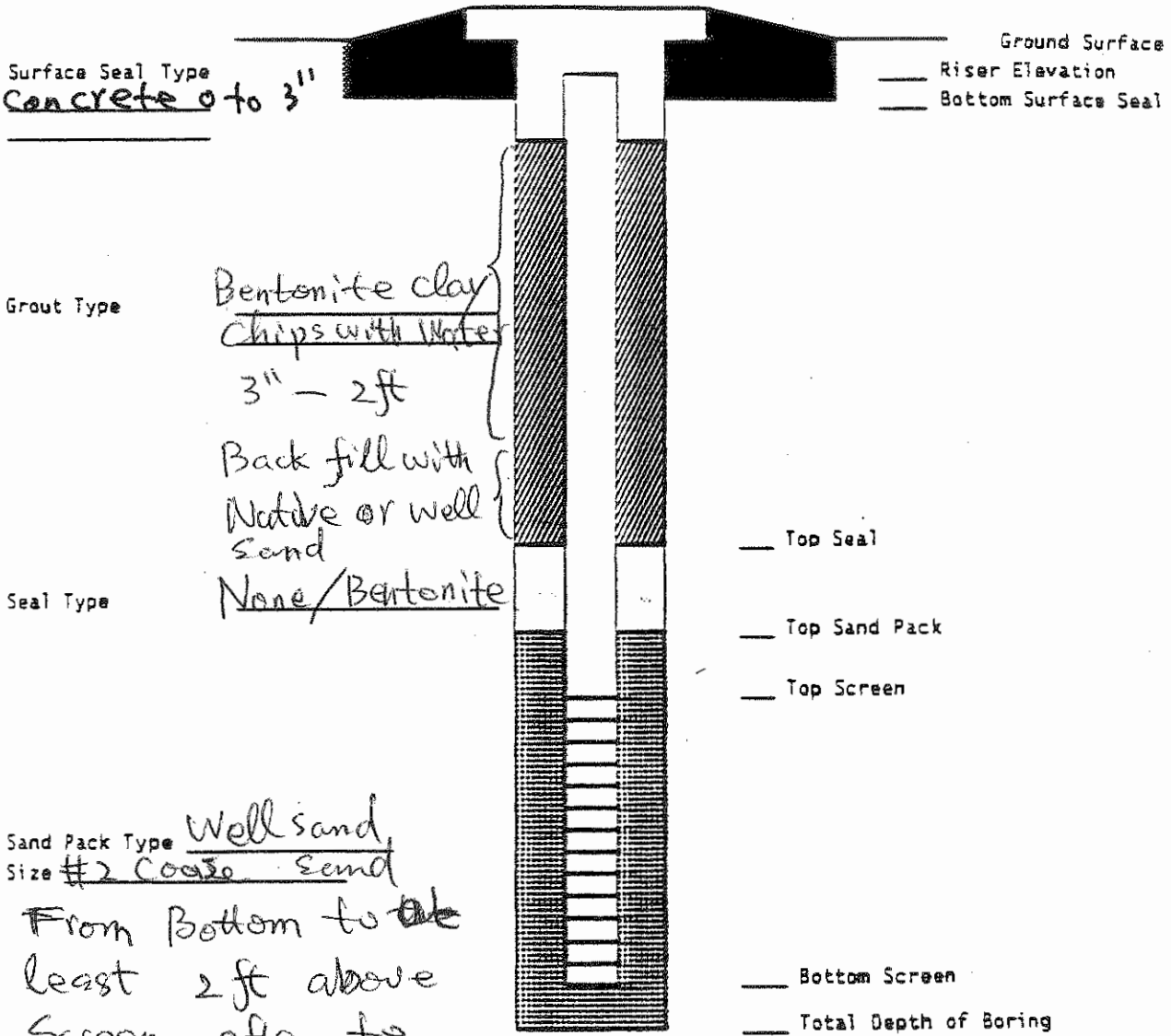
TOTAL DEPTH 15 ft SURFACE ELEV. _____ TOP RISER ELEV. _____

WATER LEVELS (DEPTH, DATE, TIME) 7 ft, 02/11/2010 DATE INSTALLED 02/11/2009

RISER DIA 1" MATERIAL PVC LENGTH 5 ft

SCREEN DIA 1" MATERIAL PVC LENGTH 10 ft SLOT SIZE 0.02"

SCHEMATIC



WELL CONSTRUCTION LOG

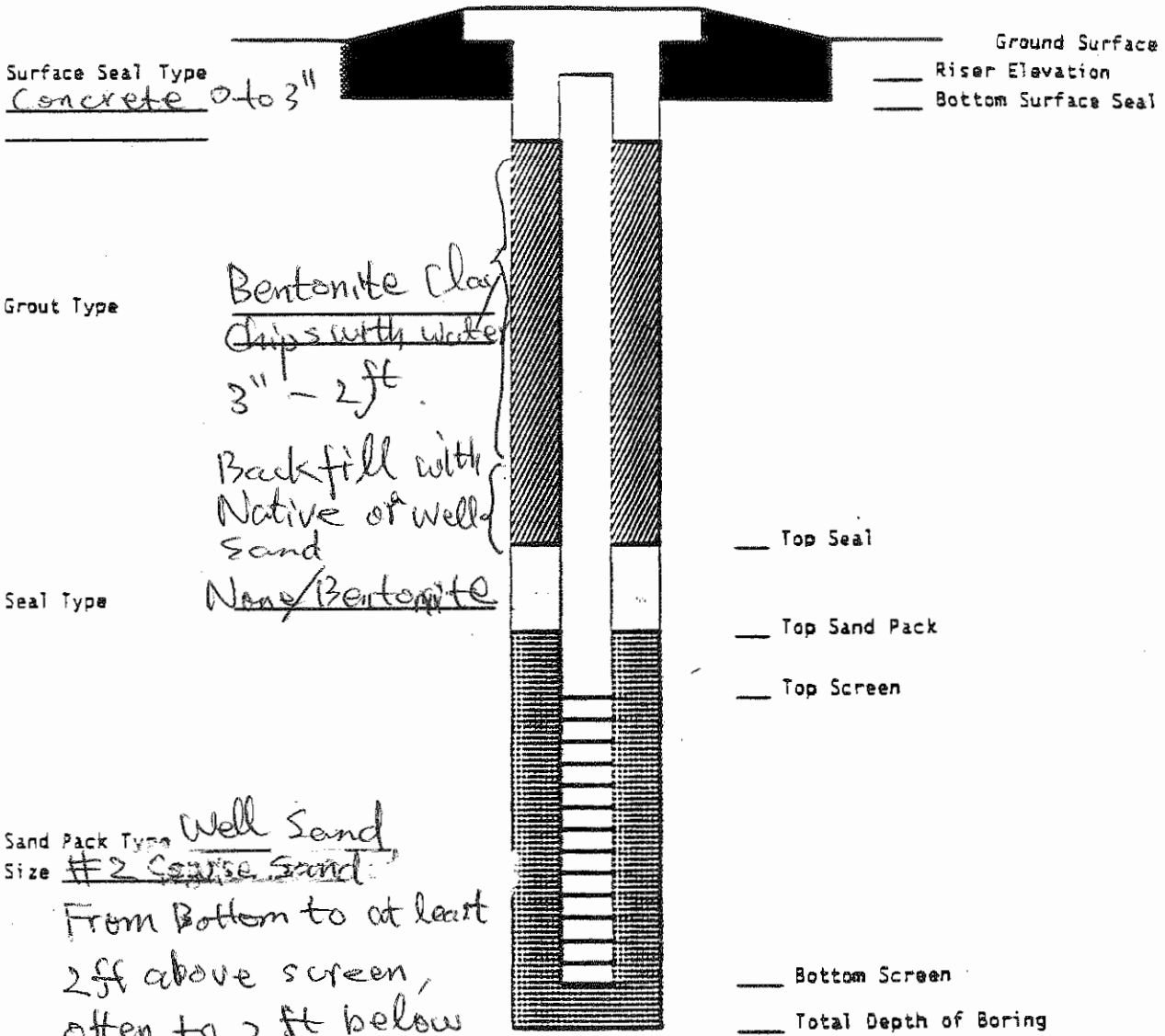
SITE 1-3 Manorhaven Blvd Port Washington NY JOB NO. #5621-PWNY WELL NO. MW-05

TOTAL DEPTH 15 ft SURFACE ELEV. _____ TOP RISER ELEV. _____

WATER LEVELS (DEPTH, DATE, TIME) 7~8' 04/09/2009 DATE INSTALLED _____

RISER	DIA 1"	MATERIAL PVC	LENGTH 5 ft			
SCREEN	DIA 1"	MATERIAL PVC	LENGTH 10 ft	SLOT SIZE 0.02"		

SCHEMATIC



ATTACHMENT 4

SVE/SSD SYSTEM INFORMATION

AIRTECH®
VACUUM

Operating and Maintenance Instructions

3BA Regenerative Blowers

INSTALLATION & OPERATING MANUAL
3BA REGENERATIVE BLOWERS

Table of Contents

1. Pump Ranges

These operating instructions cover the Airtech 3BA side channel vacuum pumps and compressors supplied with standard TEFC motors. Other configurations are available including V-belt driven units, units with explosion proof motors, mechanical seals, magnetic drives, coatings and modifications for high pressure service. Airtech can provide any combination of modifications to meet your application requirements. Such blowers, however, are outside the scope of this manual.

Description

All regenerative blowers are dynamic compression devices and utilize a non-contacting impeller to accelerate the gas and a specially designed housing to compress the gas. Cooling is accomplished by using the motor fan to blow air over the housing. In larger models, the housing is specially designed with cooling fins to allow a wider range of operation. Both the inlet and outlet ports have built-in silencers and mesh screens. Both the inlet and outlet have an inside connection thread corresponding to DIN ISO 228. On larger units, multiple suction and discharge connection configurations may be available.

The wetted parts are constructed of Aluminum on all models. The blower shares a bearing with the motor. The seal between the bearing and the motor is not gas tight in most models, therefore these blowers are not recommended for handling of toxic or explosive gases. (Contact Airtech Vacuum, Inc. for additional options if explosive or toxic gases will be handled.)

A full range of accessory items are available, including vacuum or pressure relief valves, check valves, suction filters, motor starters, vacuum/pressure cross-over valves, and in-line filters.

Application/Installation Environment

CAUTION! These blowers are designed for use in general industry. Suitable personnel protection according to OSHA requirements is provided, but the equipment should not be operated in residential settings.

Airtech blowers can be operated as either vacuum pumps or compressors. They are suitable for use with air having a relative humidity up to 90 percent, but not generally suitable for handling corrosive or erosive gases. Special versions for toxic or aggressive gases may be available. Use of the standard blower in aggressive environments may cause damage to the blower or exposure to gases being handled in the local environment.

CAUTION! Dangerous (flammable or explosive) or aggressive (corrosive) gases should not be handled by the standard blower.

Handling of flammable or aggressive gases and vapors may be possible by using a specially configured or modified blower. Contact factory for additional information. The standard blower is not suitable for operation in explosive environments as defined by NFPA 70. Contact factory for assistance.

CAUTION! The ambient and suction temperatures should be between 40 and 105 F. For temperatures outside this region, please contact the factory.

The maximum permissible pressure difference for vacuum or pressure is dependant on the motor rating (See Tables 1 to 4 for detailed information by model number.) and power supply frequency. The figures in Tables 1 to 4 are computed assuming an ambient temperature of 77 F (25 C) and a local barometric pressure of 1013 mbar (sea level). Operation at an ambient temperature of 104 F (40C) is the maximum permissible, and will result in a reduction of 10 percent on maximum vacuum or pressure attainable by the unit. For temperatures between 77 F and 104 F, reduce the maximum pressure reduction is a linear function of temperature.

Table 1. Three-phase, Single Stage, 50 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1300-7AT06	.33/.25	200-240/345-415	2.1/1.2	48/82	-100/100	53
2BA1300-7AT16	.54/.4	200-240/345-415	2.6/1.5	48/82	-120/130	53
3BA1400-7AT06	.94/.7	200-240/345-415	3.8/2.2	84/142	-120/120	63
2BA1400-7AT16	1.15/.85	200-240/345-415	4.2/2.4	84/142		63
3BA1400-7AT26	1.75/1.3	200-240/345-415	5.7/3.3	84/142	-170/200	63
3BA1500-7AT06	1.15/.85	200-240/345-415	4.2/2.4	120/204	-100/100	64
3BA1500-7AT16	1.75/1.3	200-240/345-415	5.7/3.3	120/204	-170/170	64
3BA1500-7AT26	2.15/1.6	200-240/345-415	7.5/4.3	120/204	-200/190	64
3BA1500-7AT36	2.96/2.2	200-240/345-415	9.7/5.6	120/204	-220/270	64
3BA1600-7AT06	2.15/1.6	200-240/345-415	8.5/4.9	188/320	-160/150	69
3BA1600-7AT16	2.96/2.2	200-240/345-415	9.7/5.6	188/320	-190/190	69
3BA1600-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	188/320	-260/270	69
3BA1600-7AT36	5.4/4.0	200-240/345-415	13.0/7.5	188/320	-290/360	69
3BA1630-7AT06	2.15/1.6	200-240/345-415	8.5/4.9	240/408	-160/150	69
3BA1630-7AT16	2.96/2.2	200-240/345-415	9.7/5.6	240/408	-190/190	69
3BA1630-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	240/408	-260/270	69
3BA1630-7AT36	5.4/4.0	200-240/345-415	15.6/9.0	240/408	-260/290	69
3BA1800-7AT06	5.4/4.0	200-240/345-415	15.6/9.0	280/476	-200/200	70
3BA1800-7AT16	7.4/5.5	200-240/345-415	23/13.3	280/476	-300/300	70
3BA1800-7AT26	10/7.5	200-240/345-415	29/16.7	280/476	-320/430	70
3BA1830-7AT06	5.4/4	200-240/345-415	15.6/9	400/680	-200/200	76
3BA1830-7AT16	7.4/5.5	200-240/345-415	23/13.3	400/680	-320/430	76
3BA1830-7AT26	10/7.5	200-240/345-415	29/16.7	400/680	-320/430	76
3BA1900-7AT06	10.8/8	200-240/345-415		568/965		74
3BA1900-7AT16	16.8/12.5	200-240/345-415	48.5/28	568/965	-290/280	74
3BA1900-7AT36	25/18.5	200-240/345-415	64.5/37	568/965		74
3BA1930-7AT16	16.8/12.5	200-240/345-415	48.5/28	744/1264	-290/280	71
3BA1930-7AT36	25/18.5	200-240/345-415	64.5/37	744/1264	-310/310	71
3BA7210-0AT167	.75/.55	200-240/345-415	2.8/1.6	28/48	-230/290	57
3BA7310-0AT167	.75/.55	200-240/345-415	2.8/1.6	40/68	-250/250	57
3BA7410-0AT167	1.5/1.1	200-240/345-415	5.4/3.1	50/84	-300/380	58
3BA7510-0AT168	2/1.5	200-240/345-415	7.5/4.3	70/120	-370/650	64
3BA7510-0AT268	3/2.2	200-240/345-415	9.7/5.6	70/120	-310/430	64
3BA7610-0AT168	3/2.2	200-240/345-415	9.7/5.6	96/163	-310/430	65
3BA7610-0AT368	4.4/3.3	200-240/345-415	13/7.5	96/163	-500/750	65

Table 2. Three-phase, Single-stage, 60 Hz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1300-7AT06	.39/.29	220-250/415-460	1.74/1.0	60/102	-100/100	56
2BA1300-7AT16	.67/.5	220-250/415-460	2.6/1.5	60/102	-150/160	56
3BA1400-7AT06	1.12/.83	220-250/415-460	3.75/2.15	105/179	-130/130	64
3BA1400-7AT16	1.28/.95	220-250/415-460	4.35/2.5	105/179		64
3BA1400-7AT26	2/1.5	220-250/415-460	5.5/3.2	105/179	-210/200	64
3BA1500-7AT06	1.28/.95	220-250/415-460	4.35/2.5	150/255	-80/70	70
3BA1500-7AT16	2/1.5	220-250/415-460	5.5/3.2	150/255	-150/140	70
3BA1500-7AT26	2.7/2.05	220-250/415-460	7.5/4.4	150/255	-220/210	70
3BA1500-7AT36	3.4/2.55	220-250/415-460	9.0/5.3	150/255	-260/290	70
3BA1600-7AT06	2.7/2.05	220-250/415-460	7.5/4.4	235/400	-160/150	72
3BA1600-7AT16	3.4/2.55	220-250/415-460	9.0/5.3	235/400	-190/190	72
3BA1600-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	235/400	-240/230	72
3BA1600-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	235/400	-320/310	72
3BA1630-7AT06	2.7/2.05	220-250/415-460	7.5/4.4	300/510	-160/150	72
3BA1630-7AT16	3.4/2.55	220-250/415-460	9.0/5.3	300/510	-190/190	72
3BA1630-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	300/510	-240/230	72
3BA1630-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	300/510	-260/260	72
3BA1800-7AT06	6.1/4.6	220-250/415-460	15.2/8.5	350/595	-160/160	74
3BA1800-7AT16	8.4/6.3	220-250/415-460	20/11.2	350/595	-300/280	74
3BA1800-7AT26	11.5/8.6	220-250/415-460	27.5/15	350/595	-350/400	74
3BA1830-7AT06	6.4/4.6	220-250/415-460	15.2/8.5	500/850	-160/160	79
3BA1830-7AT16	8.4/6.3	220-250/415-460	20/11.2	500/850	-300/280	79
3BA1830-7AT26	11.5/8.6	220-250/415-460	27.5/15	500/850	-350/400	79
3BA1900-7AT06	12.1/9	220-250/415-460		710/1207		79
3BA1900-7AT16	19.5/14.5	220-250/415-460	50/29	710/1207	-270/260	79
3BA1900-7AT36	28.7/21.3	220-250/415-460	68/39	710/1207		79
3BA1930-7AT16	19.5/14.5	220-250/415-460	50/29	930/1581	-270/260	75
3BA1930-7AT36	28.7/21.3	220-250/415-460	68/39	930/1581	-300/280	75
3BA7210-0AT167	1.1/.83	220-250/415-460	3.75/2.15	35/60	-270/320	62
3BA7310-0AT167	1.1/.83	220-250/415-460	3.75/2.15	48/82	-260/250	62
3BA7410-0AT167	2/1.5	220-250/415-460	5.5/3.2	60/102	-340/370	62

When operating at altitudes above 3280 feet (1000 m) above mean sea level, contact Airtech Inc.

CAUTION! Operation of the unit outside the recommended range of pressures and ambient conditions will result in shorted operating life.

Table 3. 3 Phase, Two/Three Stage, 50 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1310-7AT26	.94/.7	200-240/345-415	3.8/2.2	48/81.6	-120/120	55
3BA1410-7AT36	2.15/1.6	200-240/345-415	7.5/4.3	84/142.8	-200/190	66
3BA1410-7AT46	2.96/2.2	200-240/345-415	9.7/5.6	84/142.8	-320/420	66
3BA1510-7AT46	4.04/3.0	200-240/345-415	12.5/7.2	121.6/206.7	-340/410	72
3BA1510-7AT56	5.39/4.0	200-240/345-415	17.4/10	121.6/206.7	-390/440	72
3BA1610-7AT36	2.9/2.2	200-240/345-415	9.7/5.6	188/319.6	-190/190	73
3BA1610-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	188/319.6	-260/270	73
3BA1610-7AT36	5.39/4.0	200-240/345-415	13.0/7.5	188/319.6	-290/360	73
3BA1610-7AT46	7.41/5.5	200-240/345-415	23/13.3	188/319.6	-420/500	73
3BA1610-7AT56	10.1/7.5	200-240/345-415	29/16.7	188/319.6	-420/610	73
3BA1640-7AT36	5.39/4.0	200-240/345-415	13.0/7.5	280/476	-290/360	74
3BA1640-7AT46	7.41/5.5	200-240/345-415	23/13.3	280/476	-420/500	74
3BA1640-7AT56	10.1/7.5	200-240/345-415	29/16.7	280/476	-420/610	74
3BA1810-7AT16	7.4/5.5	200-240/345-415	23/13.3	280/476	-420/500	74
3BA1810-7AT26	10.1/7.5	200-240/345-415	29/16.7	280/476	-320/430	74
3BA1810-7AT36	14.8/11	200-240/345-415	29/16.7	280/476	-430/600	74
3BA1810-7AT46	20.2/15	200-240/345-415	56.5/32.5	280/476	-460/670	74
3BA1840-7AT26	10.1/7.5	200-240/345-415	29.0/16.7	280/476	-320/430	74
3BA1840-7AT36	14.8/11.0	200-240/345-415	48.5/28.0	280/476	-430/600	74
3BA1910-7AT16	16.8/12.5	200-240/345-415	48.5/28	624/1061	-290/280	74
3BA1910-7AT36	26.95/20.	200-240/345-415	-	624/1061	-	74
3BA7220-0AT567	2/1.5	200-240/345-415	7.5/4.3	28/48	-370/650	58
3BA7320-0AT467	1.5/1.1	200-240/345-415	5.4/3.1	40/68	-300/380	58
3BA7320-0AT567	2/1.5	200-240/345-415	7.5/4.3	40/68	-480/450	59
3BA7420-0AT267	2/1.5	200-240/345-415	7.5/4.3	50/84	-480/450	61
3BA7420-0AT567	4.4/3.3	200-240/345-415	13/7.5	50/84	-500/750	61
3BA7520-0AT268	3/2.2	200-240/345-415	9.7/5.6	70/120	-470/460	64
3BA7620-0AT368	4.4/3.3	200-240/345-415	13/7.5	96/163	-500/750	68
3BA7620-0AT468	5.4/4	200-240/345-415	14/8.1	96/163	-370/650	67
3BA7620-0AT568	7.5/5.5	200-240/345-415	19.9/11.5	96/163	-520/750	68
3BA7630-0AT668	10.1/7.5	200-240/345-415	29/16.7	96/163	-420/610	77

Table 4. 3 Phase, Two/Three Stage, 60 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1310-7AT26	1.11/.83	220-250/415-460	3.75/2.15	60/102	-130/130	61
3BA1410-7AT36	2.7/2.05	220-250/415-460	7.5/4.4	105/179	-220/210	69
3BA1410-7AT46	3.4/2.55	220-250/415-460	9.0/5.3	105/179	-350/440	69
3BA1510-7AT46	4.6/3.45	220-250/415-460	12.0/6.5	152/258	-380/360	74
3BA1510-7AT56	6.1/4.6	220-250/415-460	15.2/8.5	152/258	-410/480	74
3BA1610-7AT36	3.4/2.55	220-250/415-460	9.0/5.3	235/400	-190/190	76
3BA1610-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	235/400	-240/230	76
3BA1610-7AT36	6.4/4.8	220-250/415-460	16.5/9.8	235/400	-320/310	76
3BA1610-7AT46	8.4/6.3	220-250/415-460	20/11.2	235/400	-440/440	76
3BA1610-7AT56	11.5/8.6	220-250/415-460	27.5/15.0	235/400	-440/670	76
3BA1640-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	350/595	-320/310	78
3BA1640-7AT46	8.4/6.3	220-250/415-460	20.0/11.2	350/595	-440/440	78
3BA1640-7AT56	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-440/670	78
3BA1810-7AT16	8.4/6.3	220-250/415-460	20.0/11.2	350/595	-440/440	78
3BA1810-7AT26	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-350/400	78
3BA1810-7AT36	17/12.6	220-250/415-460	50.2/29.0	350/595	-460/600	78
3BA1810-7AT46	23.3/17.3	220-250/415-460	60.0/34.5	350/595	-490/750	78
3BA1840-7AT26	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-350/400	78
3BA1840-7AT36	17/12.6	220-250/415-460	50.2/29.0	350/595	-460/600	78
3BA1910-7AT16	19.5/14.5	220-250/415-460	50.0/29.0	780/1326	-270/260	84
3BA1910-7AT36	31/23	220-250/415-460	--- / ---	780/1326	--- / ---	84
3BA7220-0AT567	2.7/2.05	220-250/415-460	7.5/4.4	35/60	-500/740	62
3BA7320-0AT467	2/1.5	220-250/415-460	5.5/3.2	48/82	-340/370	63
3BA7320-0AT567	2.7/2.05	220-250/415-460	7.5/4.4	48/82	-430/410	63
3BA7420-0AT267	2.7/2.05	220-250/415-460	7.5/4.4	60/102	-430/410	66
3BA7420-0AT567	5.1/3.8	220-250/415-460	13.5/7.8	60/102	-510/850	66
3BA7520-0AT268	3.4/2.55	220-250/415-460	9/5.3	84/143	-500/450	70
3BA7620-0AT368	5.1/3.8	220-250/415-460	13.5/7.8	115/196	-510/850	71
3BA7620-0AT468	6.1/4.6	220-250/415-460	15.2/8.5	115/196	-480/500	71
3BA7620-0AT568	8.4/6.6	220-250/415-460	22.5/12.6	115/196	-520/820	72
3BA7630-0AT668	11.5/8.6	220-250/415-460	27.5/15	115/196	-440/670	80

Operation of any blower is possible at 87 Hertz without modification. When using a VFD to operate the blower at this frequency, refer to the nameplate for limits on vacuum and pressure, current draw and motor performance.

If your specific model number is not listed above, please consult the nameplate on the unit for electrical data. If the model you are installing is listed above, please confirm the data on the nameplate. Data in Tables 1 through 4 is subject to change and is approximate. Be sure to confirm necessary operating data what that on the nameplate before commissioning the unit.

CAUTION! Do not operate any 3BA blower above 87 Hz without consultation with the factory. Failure of the blower motor is possible when operating out of range. Consult with the factory for assistance.

Expected temperature rise of the handled gas at maximum allowable pressure differential and when operating at sea level is indicated below:

Single Stage – Approximate Temperature Rise

Blower Model	Maximum Rise at 50 Hz speed		Maximum Rise at 60 Hz speed	
	Degrees F	Degrees K	Degrees F	Degrees K
3BA1100-7..0.	115	46	136	58
3BA1200-7..0.	65	18	101	38
3BA1300-7..0.	90	32	77	25
3BA1300-7..1.	90	32	140	60
3BA1300-7..2.	90	32	158	70
3BA1400-7..0.	99	37	86	30
3BA1400-7..1.	129	54	122	50
3BA1400-7..2.	149	65	167	75
3BA1500-7..0.	86	30	72	22
3BA1500-7..1.	115	46	97	36
3BA1500-7..2.	138	59	122	50
3BA1500-7..3.	203	95	180	82
3BA1500-7..6.	248	120	248	120
3BA1600-7..0.	81	27	68	20
3BA1600-7..1.	145	63	104	40
3BA1600-7..2.	171	77	176	80
3BA1600-7..3.	225	107	185	85
3BA1600-7..6.	248	120	194	90
3BA1600-7..7.	248	120	248	120
3BA1800-7..0.	104	40	104	40
3BA1800-7..1.	153	67	185	85
3BA1800-7..2.	248	120	221	105
3BA1900-7..0.	97	36	95	35
3BA1900-7..0.	182	83	155	68
3BA1900-7..0.	230	110	212	100
3BA7210-0..1..	126	52	142	61
3BA7310-0..1..	142	61	142	61
3BA7310-0..2..	178	81	187	86
3BA7410-0..1..	194	90	214	101
3BA7510-0..1..	199	93	232	111
3BA7510-0..2..	248	120	234	112
3BA7610-0..1..	244	118	255	124
3BA7610-0..3..	244	118	255	124

Two/Three Stage – Approximate Temperature Rise

Blower Model	Maximum Rise at 50 Hz speed		Maximum Rise at 60 Hz speed	
	Degrees F	Degrees K	Degrees F	Degrees K
3BA1310-7..2.	127	53	165	74
3BA1410-7..3.	154	68	149	65
3BA1410-7..4.	181	83	180	82
3BA1510-7..4.	190	88	176	80
3BA1510-7..5.	194	90	201	94
3BA1610-7..1.	92	33	86	30
3BA1610-7..2.	129	54	118	48
3BA1610-7..3.	176	80	167	75
3BA1610-7..4.	221	105	190	88
3BA1610-7..5.	246	120	266	130
3BA1610-7..7.	176	80	167	75
3BA1610-7..8.	176	80	248	120
3BA1810-7..1.	113	45	-	-
3BA1810-7..2.	185	85	140	60
3BA1810-7..3.	248	120	248	120
3BA1910-7..1.	119	48	115	46
3BA1910-7..2.	203	95	169	76
3BA1910-7..3.	248	12	274	134
3BA7220-0..2..	131	55	171	77
3BA7220-0..5..	165	74	230	110
3BA7320-0..5..	178	81	255	124
3BA7420-0..2..	192	89	176	80
3BA7420-0..5..	250	121	243	117
3BA7520-0..2..	192	89	216	102
3BA7520-0..7..	257	125	230	110
3BA7620-0..3..	255	124	259	126
3BA7620-0..5..	255	124	262	128
3BA7630-0..6..	248	120	248	120

Tightening Torque Specifications

For non-electrical connections

Thread	Ft-lbs maximum torque	Nm maximum torque
M4	2.43	3.3
M5	3.25	4.4
M6	6.49	8.8
M8	19.47	26.4
M10	34.10	46.2
M12	56.76	77

For electrical connections

Thread	Ft-lbs torque	Nm torque
M4	0.6 to 0.9	0.8 to 1.2
M5	1.3 to 1.8	1.3 to 1.8

For metal threaded glands/unions

Thread	Ft-lbs maximum torque	Nm maximum torque
M12x1.5	3 to 4.5	4 to 6
M16x1.5	3.7 to 5.5	5 to 7.5
M20x1.5	4.4 to 6.6	6 to 9
M32x1.5	5.9 to 8.9	8 to 12
M40x1.5	5.9 to 8.9	8 to 12

For plastic threaded glands/unions

Thread	Ft-lbs maximum torque	Nm maximum torque
M12x1.5	1.5 to 2.6	2 to 3.5
M16x1.5	2.2 to 3	3 to 4
M20x1.5	3 to 3.7	4 to 5
M32x1.5	3.7 to 5.2	5 to 7
M40x1.5	3.7 to 5.2	5 to 7

Operating above the indicated maximum pressure or vacuum would overload the motor and/or overheat the unit. In addition to the maximum allowable pressure difference, careful consideration should be given to matching the motor protection devices (provided by others) to the expected current draw. In no case should the blower be operated with inadequate motor overload protection.

Since regenerative blowers are dynamic compression devices, the performance limits shown in Tables 1 to 4 are applicable only for a gas with the same specific gravity, dynamic viscosity and chemical characteristics as air. For gases with different physical properties than air, the limits will be different from those shown in the tables. Please contact Airtech for assistance in determining the proper blower size and configuration if handling gases other than air.

A vacuum relief valve or pressure relief valve should always be installed at the suction or discharge of the regenerative blower. This will prevent operation outside the applicable ranges shown in Tables 1 to 4. If the relief valves were not specified in the ordering process, please contact Airtech for details, price and availability of the needed valves before commissioning the unit. Failure to use the proper relief valve may result in failure of the blower due to operation outside the applicable limits; any such failure is outside the scope of Airtech's standard warranty.

WARNING! Be sure to install the necessary personnel protection devices if unexpected shut-down of the unit presents danger of death or injury.

2. Installation

As illustrated in Figure 1, the Airtech 3BA blower can be installed in any physical configuration.

CAUTION! Regenerative blowers can have surface temperatures in excess of 120 F. To avoid burns or other physical injury, take care to avoid contact with the surfaces of the blower during and immediately after operation.

To ensure adequate cooling of the blower during operation, install the blower with the minimum clearance as indicated in the table below.

Minimum installation clearances, 3BA blowers

Range	Distance from fan guard to closest obstruction. (inches/mm)	Distance from cover (opposite of fan) to closest obstruction. (inches/mm)
3BA11 through 3BA14	1.4/34	0.79/20
3BA15 through 3BA19	2.1/53	1.57/40
3BA72 and 3BA73	1.3/34	1.18/30
3BA74 through 3BA76	2.1/54	1.18/30

Please note that it may be desirable, where possible, to allow for larger clearances to allow access for maintenance or repair personnel. The noted clearances are to ensure adequate air flow for cooling only and are a minimum requirement.

Failure to allow for the noted clearances may result in premature failure of the blower due to lack of cooling, even if all other precautions are taken as recommended. For specific advice about installations requiring closer clearances, please contact Airtech, Inc. for recommendations.

Airtech regenerative blowers can be mounted in any configuration, either horizontally or vertically mounted. It is not usually necessary to bolt the smaller blowers to a rigid surface during operation, though this may be desirable to reduce pipe vibration, movement and noise. Larger models should be bolted in place, especially when installed vertically, to prevent possible rotation, damage or injury due to start-up torque.

CAUTION! For installations at altitudes greater than 3250 Feet above sea level there will be a loss in capacity. Please contact your factory representative for assistance in determining the extent of the loss of capacity likely at your specific location.

WARNING! Be sure to follow all local codes and regulations with respect to installation and operation of the blower. The blower motor should be wired to a branch circuit disconnect and all other safety devices recommended by the relevant sections of NFPA 70, National Electrical Code, and in accordance with all applicable state and local regulations and requirements.

Installation Procedure

Perform the installation exactly in accordance with the following steps:

1. For vacuum operation, connect the suction pipe to connection A, and for pressure operation connect the pressure pipe to connection B (See Figure 1). Install startup screens before startup to protect pump from debris.

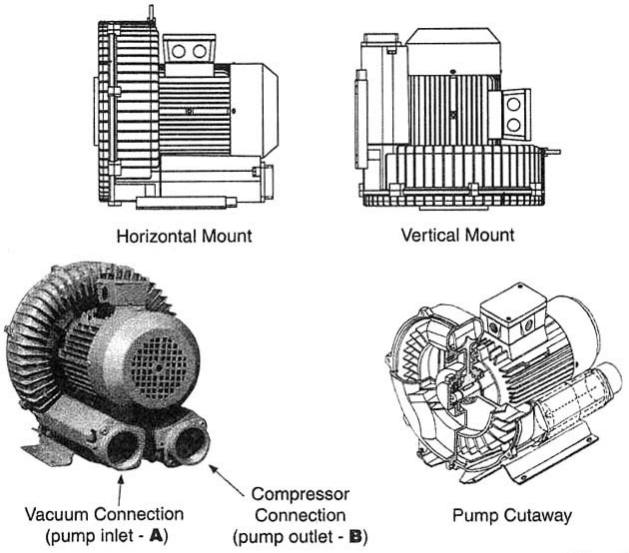


Figure 1

CAUTION! Design your piping system to avoid unnecessary pressure loss, which may significantly affect the operation of any regenerative blower. Contact your Airtech representative for assistance in designing and configuring an appropriate piping system for your application.

For alternation between vacuum and pressure in any application, changeover valves are available. Use of the changeover valve allows the same connection to be used for both vacuum and pressure.

2. The electrical data shown in Tables 1 to 4 should be confirmed by examination of the motor data plate on your 3BA blower. The motors feature Class F insulation as a standard and are UL recognized for applications in both Canada and the United States (CUL). Motors are IEC design IP55, equal to a NEMA TEFC motor design. The connection diagram for the motors can be found in the inside of the terminal box cover. Be sure to confirm that your electrical supply has sufficient capacity to operate the blower according to the nameplate requirements.

3. A magnetic motor starter should always be used to connect the motor to the power supply. It is advisable to use thermal overload motor starters to provide

maximum protection for the motor and wiring. All cabling used on starters should be secured with good quality cable clamps.

We recommend that the motor starters used feature a time delay trip on high amperage to avoid nuisance trips on start-up. When the unit is started cold, over amperage may be experienced for a short time due to the higher resistance of the windings at lower temperatures.

If using a change over or solenoid valve, ensure that the voltage connected to the valve matches that shown on the valve instructions or nameplate. Most valves are rated for 110 Volts 60Hz or 220 Volts 50 Hz. Connection of these valves to higher voltages may result in immediate valve failure.

WARNING! The electrical installation should be made by a qualified electrician and in complete compliance with all NFPA 70 (National Electrical Code) requirements along with all state and local code requirements. The main disconnect and motors starters are assumed to be provided by others.

4. Install the necessary relief valves and confirm their proper operation.

3. Start-up

CAUTION! Do not start the blower motor more than 10 times in one hour. If multiple and frequent start-ups are required by your application, install a minimum run timer in the motor control circuit to avoid decreased motor life and possible fire due to over-starting of the motor.

1. Before operation, confirm the correct direction of rotation by jogging (switching rapidly on and off) the motor and observing the motor fan rotation in the same direction as the arrow. If the direction of rotation is incorrect, lock out the power and switch two leads (three phase) or rewire (single phase) to effect the opposite rotation direction. Recheck the direction of rotation before proceeding.

2. Do not operate the blower at pressure or vacuum ranges that exceed those shown in Tables one through four for the model being installed. This can be achieved by use of the recommended relief valve shown in Table 5.

Note: Relief valves that have been factory pre-set have a label indicating the set pressure and an arrow indicating the direction of flow. The arrow will point into the pipe when installed in vacuum applications and out of the pipe when installed in pressure applications. Do not re-set the relief valve if it has been pre-set from the factory.

In the event the relief valve setting needs to be reset, adjust the set screw to increase or decrease the tension on the spring. Place the blower in operation and note the current draw of the motor. When the current draw of the motor is near the maximum noted on the motor nameplate, tighten the locking nut on the valve and proceed.

3. When checking the current draw of the motor with an ammeter, be sure to confirm the voltage at the motor junction box. Low voltage conditions may result in difficulty starting or in unexpected motor failure or motor starter trips.

Potential Risks for Operators

Noise emission: Free field noise limits are indicated in Tables one through four. Hearing protection is not normally required at the expected noise generation levels in the table; however, local conditions may result in higher ambient noise. If this is the case and local noise exceeds OSHA recommended levels for expected exposure time (typically 85 dBA for eight hours), hearing protection should be used.

4. Maintenance and Servicing

WARNING! Be sure the power supply is disconnected and locked out before attempting to do any maintenance on the unit. It is critical that the unit be locked out from starting during maintenance as severe injury or death could result from exposure to high voltage or rotating parts.

CAUTION! Allow the blower to cool to a surface temperature of lees than 100 F before attempting maintenance. Prolonged exposure to temperatures above 120F can cause severe burns.

Clean the blower surfaces periodically to avoid build up of dust or other debris. Build up of debris can cause overheating and premature failure of the blower.

If an inlet filter is being use, ensure that it remains clean during operation by examining the filter cartridge for debris build up. Replace dirty or clogged filter cartridges.

On pressure units, periodically clean the inlet mesh screen to avoid loss of capacity. If an external inlet filter is used, the filter element should be cleaned monthly or as frequently as required by local conditions. Excessive pressure drop will develop from use of clogged or dirty filters. This pressure drop will degrade blower performance and increase operating temperatures, leading possibly to premature pump failure.

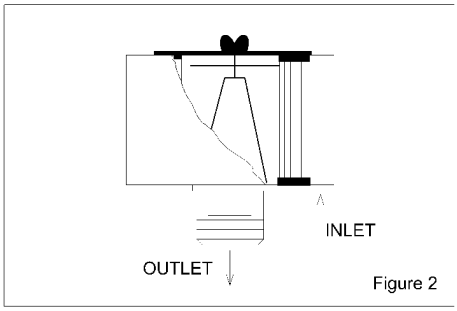


Figure 2

To replace the filter, remove the wing nut and cover. Remove the element and either clean with compressed air or replace. Reassemble in reverse order.

For vacuum applications, the optional in-line vacuum filter must be cleaned regularly, depending on local conditions. Cleaning can be achieved by blowing out with compressed air. If cleaning is not possible, replace the cartridge. Access the cartridge by unhooking the relevant clips and removing the cover.

CAUTION! Do not attempt to check the filter cartridge during operation of the blower. Only check the cartridge after disconnecting the power from the blower and locking out the power to prevent an unexpected start.

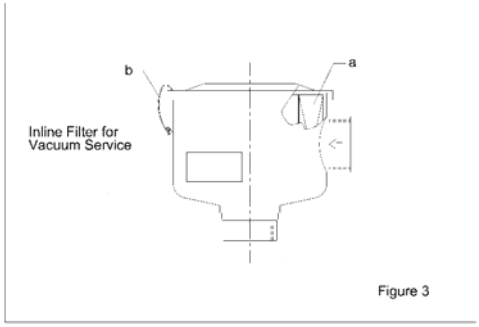


Figure 3

Bearings require regreasing with Exxon/Esso UNIREX N3 or equal grease after approximately 20,000 operating hours (normal conditions) or between 2 and 3 years after installation and commissioning. Do not mix grease types.

Troubleshooting Chart

Fault	Cause	Remedy	Responsible Party
Motor does not start, no noise.	Two or more power legs interrupted	Check fuses, terminals, etc.. for source of interruption and correct.	Electrician
Motor does not start, humming noise.	One power supply lead interrupted	Check fuses, terminals, etc.. for source of interruption and correct.	Electrician
	Impeller is jammed.	Open blower cover, remove debris, clean.	Service Technician
		Check impeller clearance and reset if necessary.	
	Defective Impeller	Replace impeller.	Service Technician
	Defective Bearing	Replace defective bearing.	Service Technician
Trip of motor starter at start-up	Incorrect starter setting	Ensure starter setting is correct (check current on nameplate)	Electrician
	Winding short-circuit	Megger motor	Electrician
	Motor overloaded due to operation of pump at excessive differential pressures.	Inspect filters, mufflers and connection pipes and clean as required. Check relief valve operation. Reset or replace as necessary.	Operator
	Impeller Jammed	See above fault Motor does not start, humming noise, cause jammed impeller.	Operator
Excessive Power Consumption	Lime or other deposits	Decalcify or clean unit as required (see Maintenance Chart)	Operator
No Vacuum or Pressure.	Severe leak in system	Close off pump and run deadheaded to confirm pump is operating properly. If so, find and fix leak in the system.	Operator
	Wrong direction of rotation	Check air flow direction and change direction of rotation if necessary.	Operator Electrician

Insufficient Vacuum	System too small	Use larger system	Operator
	Inlet piping too long or too small.	Increase pipe diameter to reduce pressure loss in inlet piping. Contact Airtech for assistance in determining correct pipe size.	Operator
	Leak at connection to vacuum system.	Check for leaks and repair if necessary.	Operator
	Density of gas handles different from air.	Consider increased limits on operation due to density differences. Consult Airtech, Inc. for assistance.	Airtech Engineering
	Change in impeller geometry due to erosion	Clean impeller and examine for wear. Replace if necessary.	Service Technician
	Inlet filter clogged.	Change filter element; remove clog.	Operator
	Vacuum relief valve incorrectly set.	Reset or replace vacuum relief valve. Contact Airtech for assistance.	Operator
	Seal defective.	Replace seal.	Service Technician
Abnormal flow noises.	Flow speed too high.	Clean pipes or use larger pipes to connect unit to process.	Operator
	Muffler soiled.	Clean muffler inserts, replace if necessary.	Operator
Abnormal running noise	Ball bearing defective or insufficient lubrication on bearing.	Re-grease or replace bearing as required.	Service Technician
Compressor leaky	Seals on muffler defective.	Tighten muffler connection. Replace gasket if necessary.	Operator
	Seals in motor area defective	Replace as necessary.	Service Technician

Repair on-site

WARNING! Before attempting an on-site repair, ensure that a qualified electrician has disconnected the motor from the power supply so that accidental starting of the motor is impossible.

After a repair and before re-installation be sure to follow the instructions noted in this manual under “Installation and Operation.”

Lifting

For smaller units (less than 65 lbs/ 30 kgs), it may be possible to lift the units manually. When doing so, be sure to understand the weight of the unit being lifted and to follow good lifting safety procedures.

Model	Weight Lbs/kgs	Model	Weight Lbs/kgs
3BA1300-7AT06	20/9	3BA1310-7AT26	33/15
2BA1300-7AT16	22/10	3BA1410-7AT36	55/25
3BA1400-7AT06	29/13	3BA1410-7AT46	59.5/29
3BA1400-7AT26	37.5/17	3BA1510-7AT46	86/39
3BA1500-7AT06	40/18	3BA1510-7AT56	97/44
3BA1500-7AT16	46.5/21	3BA1610-7AT26	104/47
3BA1500-7AT26	51/23	3BA1610-7AT36	119/54
3BA1500-7AT36	55/25	3BA1610-7AT46	163/74
3BA1600-7AT06	57.5/26	3BA1610-7AT56	172/78
3BA1600-7AT16	64/29	3BA1640-7AT36	128/58
3BA1600-7AT26	75/34	3BA1640-7AT46	172/78
3BA1600-7AT36	90.5/41	3BA1640-7AT56	181/82
3BA1800-7AT06	128/58	3BA1810-7AT16	250/113
3BA1800-7AT16	143/65	3BA1810-7AT26	260/118
3BA1800-7AT26	150/68	3BA1810-7AT36	316/143
3BA1900-7AT06	265/120	3BA1810-7AT46	341/155
3BA1900-7AT16	314/142	3BA1840-7AT26	260/118
		3BA1840-7AT36	316/143
		3BA1910-7AT16	409/186
		3BA1910-7AT36	455/206
3BA7210-0AT167	35.3/16	3BA7220-0AT567	61.7/28
3BA7310-0AT167	35.3/16	3BA7320-0AT567	66.1/30
3BA7410-0AT167	50.7/23	3BA7420-0AT267	72.7/33
3BA7510-0AT168	57.3/26	3BA7420-0AT567	86/39
3BA7510-0AT268	63.9/29	3BA7520-0AT268	88.2/40
3BA7610-0AT168	70.5/32	3BA7620-0AT368	106/48
3BA7610-0AT368	77.2/35	3BA7620-0AT568	143/65
		3BA7630-0AT668	207/94

When lifting 3BA15 through 3BA19 (but not 3BA1943 units) or the 3BA75 through the 3BA76, use the eye bolt provided (eye bolts are not included on smaller units). One attachment point should be sufficient. Ensure that the crane is rated for the weight being lifted.

For the 3BA1943, use the eye bolt and the holes in the feet of the blower to lift and maintain a balanced load.

Storage

The 3BA units should be stored in a clean, dry environment. If stored in an area with a humidity of greater than 80 percent, store in a closed container with desiccant drying agents to avoid damage.

Disposal

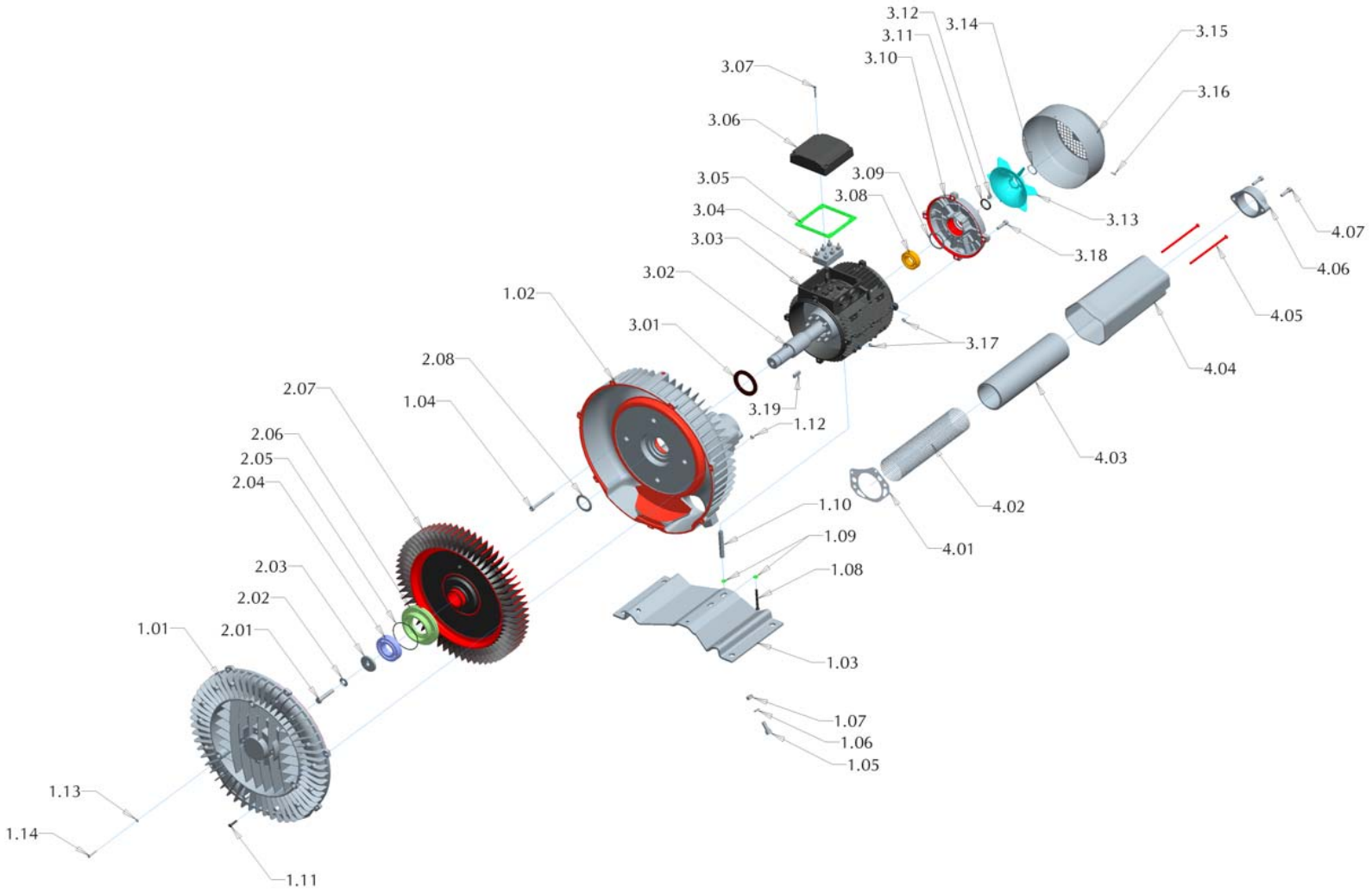
Dispose in accordance with all local health and safety regulations.

Spare parts list are available from your local Airtech service center. Please contact your local Airtech representative for assistance.

For additional assistance, please contact:

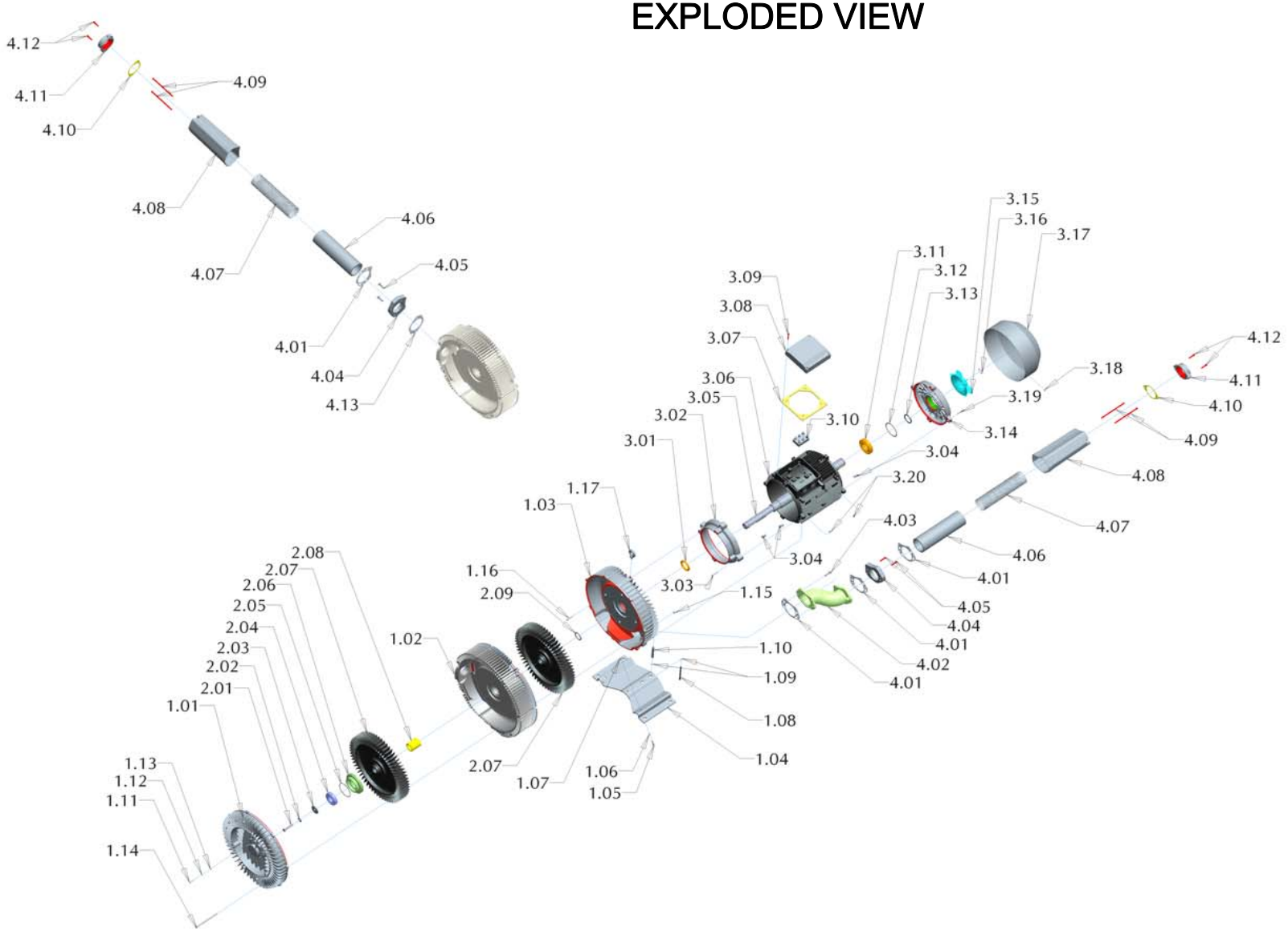
Airtech, Inc.,
150 South Van Brunt Street
Englewood, NJ, 07631
Phone: 1-201-569-1173
Fax: 201-569-1696.

3BA1 SINGLE STAGE
EXPLODED VIEW



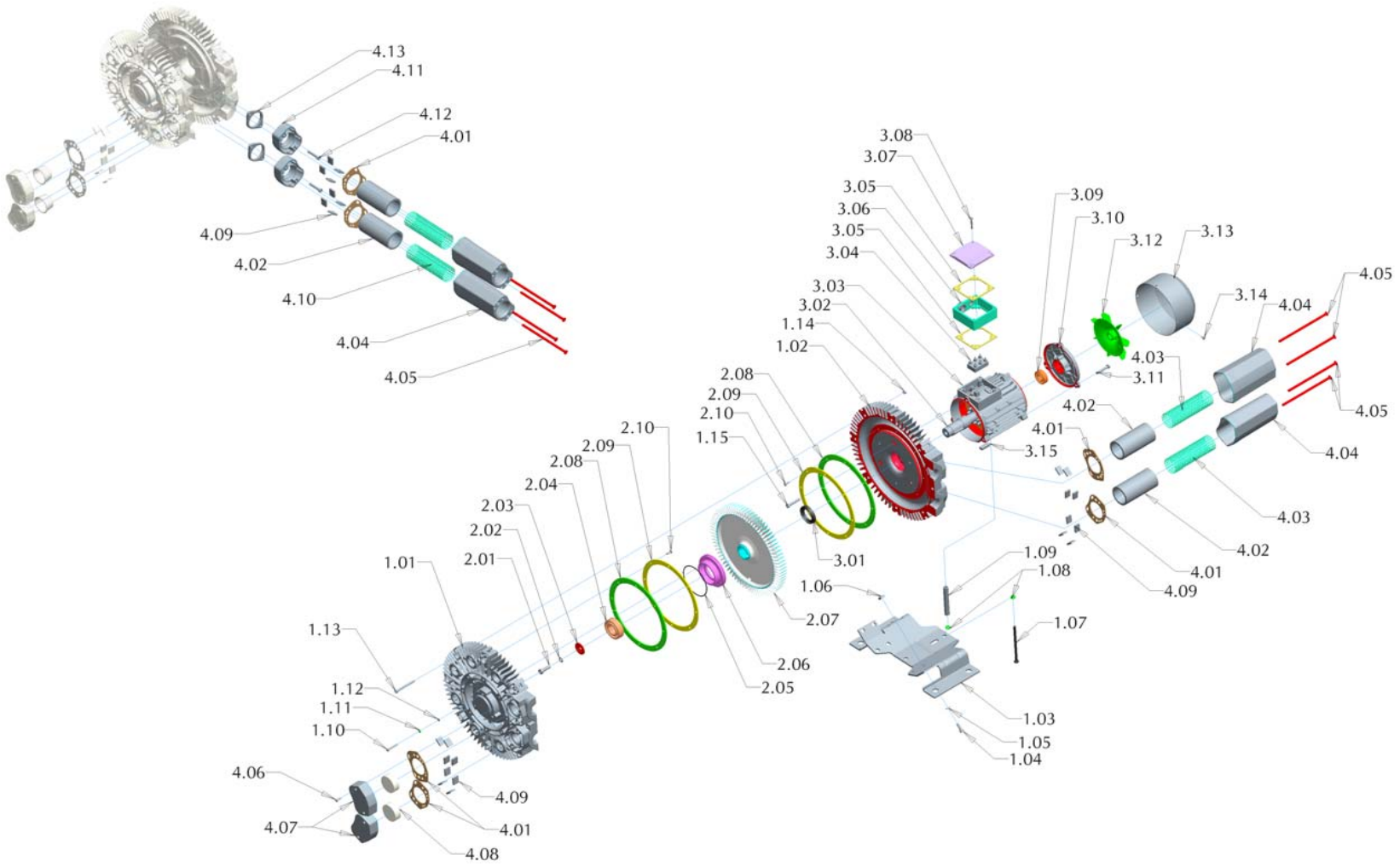
No.	Qty.	Description
1.01	1	Cover
1.02	1	Housing
1.03	1	Mounting Plate
1.04	4	Motor Mounting Screw
1.05	2	Mouting Plate Screw
1.06	2	Mounting Plate Washer
1.07	2	Mouting Plate Nut
1.08	1	Stator Support Screw
1.09	2	Stator Support Washer
1.10	1	Stator Support Sleeve
1.11	8	Cover Mounting Screw
1.12	8	Cover Mounting Nut
1.13	4	Bearing Cover Washer
1.14	4	Bearing Cover Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	1	Impeller
2.08	1	Disc
3.01	1	Seal
3.02	1	Motor Rotor
3.03	1	Stator
3.04	1	Terminal Block
3.05	1	Motor Terminal Box Gasket
3.06	1	Cover For Terminal Box
3.07	4	Terminal Box Cover Screw
3.08	1	Rear Bearing
3.09	1	Bearing Preloading Ring
3.10	1	End Shield
3.11	1	Tolerance Ring
3.12	1	Shaft Key
3.13	1	External Fan
3.14	1	Retaining Ring
3.15	1	Fan Cowl
3.16	4	Fan Cowl Screw
3.17	8	Stator Nut
3.18	4	End Shield Screw
3.19	1	Parallel Key
4.01	2	Silencer Gasket
4.02	2	Silencer Insert
4.03	2	Silencer Insert Filler
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	2	Flange
4.07	4	Flange Screw

3BA1 TWO STAGE
EXPLODED VIEW



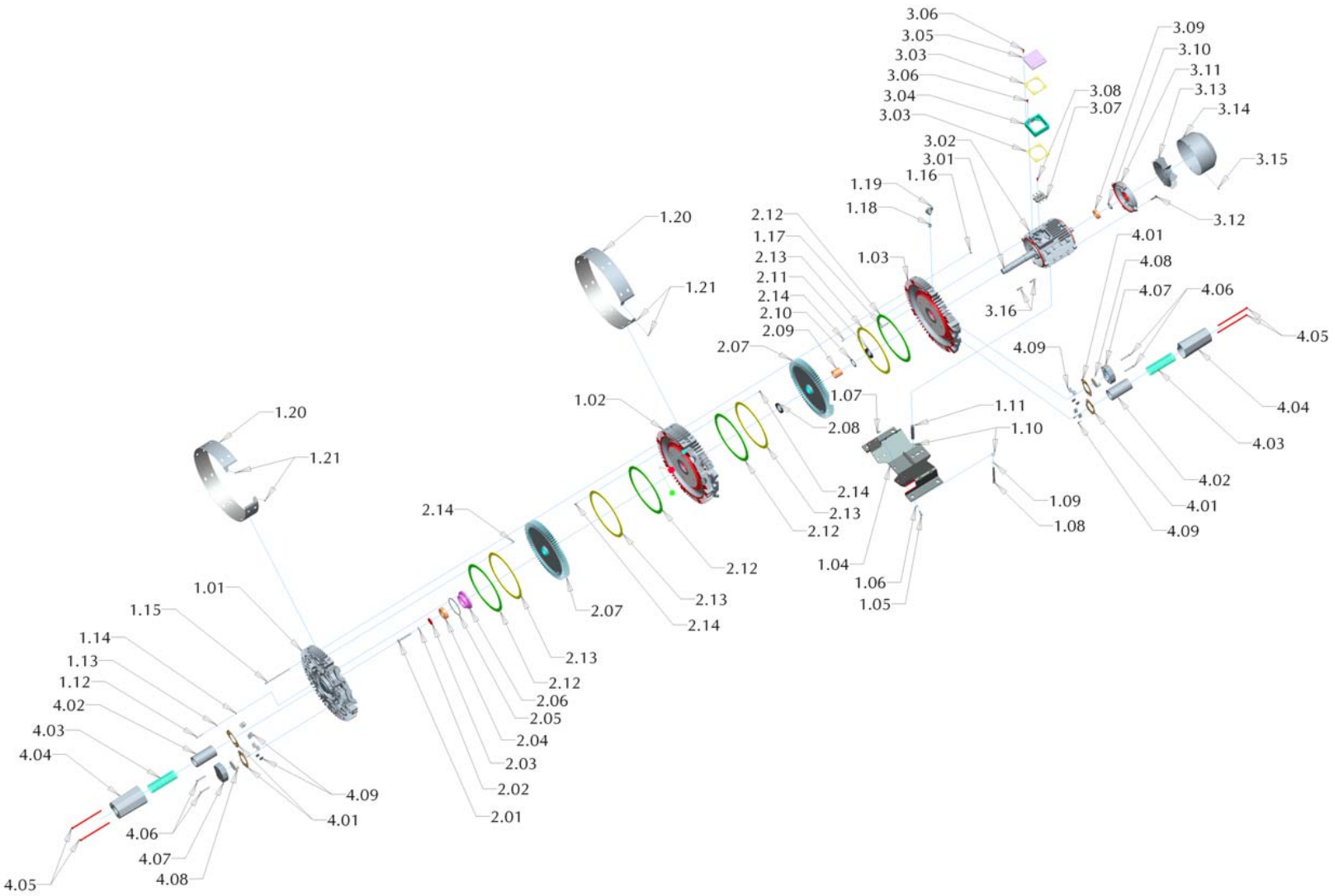
No.	Qty.	Description
1.01	1	Cover
1.02	1	Center Section
1.03	1	Blower Housing
1.04	1	Mounting Plate
1.05	2	Plate Mounting Screw
1.06	2	Mouting Plate Washer
1.07	2	Mounting Plate Nut
1.08	1	Stator Support Screw
1.09	2	Stator Support Washer
1.10	1	Stator Support Sleeve
1.11	4	Bearing Cover Screw
1.12	4	Bearing Screw Washer
1.13	4	Bearing Ring Seal
1.14	8	Cover Mounting Screw
1.15	8	Cover Mounting Nut
1.16	4	Motor Mounting Screw
1.17	1	Lifting Ring
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	2	Impeller
2.08	1	Sleeve
2.09	1	Disk
3.01	1	Shaft Seal Ring
3.02	1	Motor Attachment
3.03	4	Motor Attachment Screw
3.04	3	Parallel Key
3.05	1	Motor Rotor
3.06	1	Stator
3.07	1	Motor Terminal Box Gasket
3.08	1	Cover For Terminal Box
3.09	4	Terminal Box Cover Screw
3.10	1	Terminal Block
3.11	1	Rear Bearing
3.12	1	End Shield Seal
3.13	1	Rotary Shaft Lip Seal
3.14	1	End Shield
3.15	1	External Fan
3.16	1	Retaining Ring
3.17	1	Fan Cowl
3.18	4	Fan Cowl Screw
3.19	4	End Shield Screw
3.20	8	Stator Nut
4.01	4	Silencer Gasket
4.02	1	Silencer Attachment
4.03	2	Silencer Attachment Screw
4.04	2	Silencer Flange
4.05	4	Silencer Flange Screw
4.06	2	Silencer Insert Filler
4.07	2	Silencer Insert
4.08	2	Silencer Casing
4.09	4	Silencer Screw
4.10	2	Flange Gasket
4.11	2	Flnage
4.12	4	Flange Screw
4.13	1	Side Silencer Gasket

3BA7 SINGLE STAGE
EXPLODED VIEW



No.	Qty.	Description
1.01	1	Cover
1.02	1	Housing
1.03	1	Mounting Plate
1.04	4	Plate Mounting Screw
1.05	4	Mouting Plate Washer
1.06	4	Mounting Plate Nut
1.07	1	Stator Support Screw
1.08	2	Stator Support Washer
1.09	1	Stator Support Sleeve
1.10	3	Bearing Cover Screw
1.11	3	Bearing Screw Washer
1.12	3	Bearing Ring Seal
1.13	8	Cover Mounting Screw
1.14	8	Cover Mounting Nut
1.15	3	Motor Mounting Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	1	Impeller
2.08	2	Teflon Seal
2.09	2	Retaining Ring
2.10	16	Inner Seal Screw
3.01	1	Shaft Seal Ring
3.02	1	Motor Rotor
3.03	1	Stator
3.04	1	Terminal Block
3.05	2	Motor Terminal Box Gasket
3.06	1	Terminal Box
3.07	1	Cover For Terminal Box
3.08	4	Terminal Box Cover Screw
3.09	1	Rear Bearing
3.10	1	End Shield
3.11	3	End Shield Screw
3.12	1	External Fan
3.13	1	Fan Cowl
3.14	4	Fan Cowl Screw
3.15	1	Parallel Key
4.01	4	Silencer Gasket
4.02	2	Silencer Insert Filler
4.03	2	Silencer Insert
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	4	Flange Screw
4.07	2	Flange Cap
4.08	2	Flange Filler
4.09	16	Filler
4.10	2	Silencer Insert
4.11	2	Flange
4.12	4	Flange Screw
4.13	2	Flange Gasket

3BA7 TWO STAGE
EXPLODED VIEW



No.	Qty.	Description
1.01	1	Cover
1.02	1	Center Section
1.03	1	Housing
1.04	1	Mounting Plate
1.05	4	Plate Mounting Screw
1.06	4	Mouting Plate Washer
1.07	4	Mounting Plate Nut
1.08	1	Stator Support Screw
1.09	1	Stator Support Lock Washer
1.10	2	Stator Support Washer
1.11	1	Stator Support Sleeve
1.12	3	Bearing Cover Screw
1.13	3	Bearing Screw Washer
1.14	3	Bearing Ring Seal
1.15	8	Cover Mounting Screw
1.16	8	Cover Mounting Nut
1.17	4	Motor Mounting Screw
1.18	1	Lifting Ring Nut
1.19	1	Lifting Ring
1.20	2	Blower Cowl
1.21	4	Blower Cowl Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	2	Impeller
2.08	1	Rotary Shaft Seal
2.09	1	Sleeve
2.10	1	Disk
2.11	1	Shaft Seal Ring
2.12	4	Teflon Seal
2.13	4	Retaining Ring
2.14	32	Inner Seal Screw
3.01	1	Motor Rotor
3.02	1	Stator
3.03	2	Motor Terminal Box Gasket
3.04	1	Terminal Box
3.05	1	Cover For Terminal Box
3.06	8	Terminal Box Screw
3.07	1	Terminal Block
3.08	1	Terminal Block Screw
3.09	1	Rear Bearing
3.10	1	End Shield Disk
3.11	1	End Shield
3.12	4	End Shield Screw
3.13	1	External Fan
3.14	1	Fan Cowl
3.15	4	Fan Cowl Screw
3.16	2	Parallel Key
4.01	4	Silencer Gasket
4.02	2	Silencer Insert Filler
4.03	2	Silencer Insert
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	4	Flange Screw
4.07	2	Flange Cap
4.08	2	Flange Filler
4.09	16	Filler

Airtech, Inc. ("Company") Warranty Statement

Company warrants that on the date of shipment to Purchaser the goods will be of the kind and quality described herein, merchantable, and free of all defects in workmanship and materials.

If within one year from the date of initial operation, but not more than eighteen months from date of shipment by the Company, of any item of the goods, Purchaser discovers that such item was not as warranted above and promptly notifies Company in writing thereof, Company shall remedy such defect by, at the Company's option, adjustment, repair or replacement of the item and any affected part of the good. Purchaser shall assume all responsibility and expense for removal, reinstallation and freight in connection with the foregoing remedy. The same obligations and conditions shall extend to replacement items furnished by the Company hereunder. Company shall have the right of disposal of items replaced by it. Purchaser shall grant Company access to the goods at all reasonable times in order for Company to determine any defect in the goods. In the event that adjustment, repair or replacement does not remedy the defect, the Company and Purchaser shall negotiate in good faith an equitable adjustment in the contract price.

The Company's responsibility does not extend to any item of the goods which has not been manufactured and sold by the Company. Such item shall be covered only by the express warranty, if any, by the manufacturer thereof. The Company and its suppliers shall also have no responsibility if the goods have been improperly stored, handled or installed, or if the goods have not been operated or maintained according to their ratings or according to the instructions in Company or supplier furnished manuals, or if unauthorized repairs or modifications have been made to the goods.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES (EXCEPT TITLE) INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, AND CONSTITUTES THE ONLY WARRANTY OF COMPANY WITH RESPECT TO THE GOODS.

The forgoing states Purchaser's exclusive remedy against Company and its suppliers for any defect in the good or for failure of the goods to be as warranted, whether Purchaser's remedy is based on contract, warranty, failure of such remedy to achieve its essential purpose, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or defects from any cause.

Neither Company nor its suppliers shall be liable, whether in contract, warranty, failure of a remedy to meet its essential purpose, tort (including negligence), strict liability, indemnity or any other legal theory, for loss of use, revenue or profit or for cost of capital or of substitute use or performance or for indirect, liquidated, incidental or consequential damages or for any other loss or cost of a similar type, or for claims by Purchaser for damages of Purchaser's customers.

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APPENDIX 1

GROUNDWATER SAMPLING LOG

SEVERN TRENT
ENVIRONMENTAL SERVICES
100 MORRIS AVENUE
GLEN COVE, NY 11542

MONITORING WELL INFORMATION

Date: **Sampler:**
Property Address:

Monitoring Well Characteristics

Well No.	**Well Diameter: ”**	**Gallons/Ft.**
Depth of Well, (Ft.)		
Depth to Water, (Ft.)		
Depth of Water, (Ft.)		
Volume of Well, (Gals.)		

Sampling and Purging of Monitoring Wells

Readings	**Time**	**Depth to Water**	**Purge Rate**	**pH**	**Spec C**	**Turb**	**DO**	**Temp**	**Salinity**	**ORP**
		ft	ml/min	S.U.	µS·cm-1	NTU	ml/l	^{o}C	ppt	mV
Initial										
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Low Flow Sampling Method __ Purge & Bailer Method
Flow rate: Purge Volume

APPENDIX 2

INSPECTION CHECKLIST

Chez Valet - SSDS/SVE System

Monthly Site Visit Sheet

Date-Time _____ Operator _____

Weather

Vacuum Point readings					
			after adjustments		
	time	Inches WC		time	Inches WC
VP-1			VP-1		
VP-2			VP-2		
VP-3			VP-3		
VP-4			VP-4		
VP-5			VP-5		
VP-6			VP-6		
VP-7			VP-7		

Vacuum Guage Readings					
			After adjustments		
	time	Inches WC		time	In Water
Valve -1			Valve -1		
Valve -2			Valve -2		
Valve -3			Valve -3		
Valve -4			Valve -4		
Valve -5			Valve -5		
Valve -6			Valve -6		
Valve -7			Valve -7		
Valve-8			Valve-8		
Valve -9			Valve -9		
Valve 10			Valve 10		
Valve 11			Valve 11		
Valve 12			Valve 12		
K.O.P			K.O.P		

Blower elapsed time reading	
Blower Discharge velocity	

PID Readings					
	ppb		ppb		ppb
Pre-Carbon		Mid-Carbon		Post-Carbon	

Comments-Notes

APPENDIX 3

SITE WIDE INSPECTION FORMS

Chez Valet

Site Wide Inspection

Date-Time _____ Inspector _____

Weather

Building
Modifications to building since last inspection?
Slab Condition
Gounds - Any Modifications

SVE/SSD System
Vacuum Blower Operational
Elapsed Time Meter Operational
Pipe Header Guage operational
Blower Vacuum Guage Operational
SVE/SSD Pipe Condition
Carbon Vessels conditon and piping

Groundwater Monitoring Wells
Condition
Capped?
Damaged