BROWNFIELD CLEANUP PROGRAM

ALTERNATIVES ANALYSIS/
REMEDIAL ACTION PLAN

FOR

HNJ REALTY LLC.
FOR
SCHMUKLERS CLEANERS
358 - 364 North Avenue, New Rochelle, New York
Site No.: C360088
Index No.: A3-0542-0306

PREPARED FOR
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
625 BROADWAY
ALBANY, NEW YORK 12233-7016

PREPARED BY

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December 2017
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ATTACHMENTS

DER-10 Certification

I , John V. Soderberg, P.E., certify that I am currently a NYS registered professional engineer [as defined in 6 NYCRR Part 375] , and that this Alternatives Analysis/ Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and is in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

John V. Soderberg P.E

Seal:

Signature:

License number: 049975

Date: December 15, 2017

1.0 INTRODUCTION

The following document is an Alternatives Analysis (AA)/Remedial Action Work Plan (RAWP) or AA/RAWP prepared by John V. Soderberg P.E. (JVS), on behalf of HNJ Realty LLC, pursuant to the requirements of an executed Brownfield Cleanup Program Agreement (BCA) (dated February 27, 2006), between the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER) and HNJ Realty, LLC, *the Volunteer*. The Site is a commercial property located at 358 through 364 North Avenue, New Rochelle, New York (Figures 1 and 2), fully described as Section 4 - Block 1206 - Lot 19 of the tax maps of City of New Rochelle.

The AA/RAWP has been developed to evaluate remedial action options in accordance with CERCLA [40 CFR 300.430(e)]. The AA/RAWP emphasizes data analysis and is generally performed using data gathered during the Remedial Investigation (RI). The main goal of the AA/RAWP is to identify the remedial program, define the nature and extent of contamination to be addressed by the alternatives developed, identify the Remedial Action Objectives (RAOs) for the site, develop remedial action alternatives and evaluate the alternatives in order to select and implement the appropriate remedy for the Site. The AA/RAP also includes a Remedial Action Work Plan describing the implementation of the selected remedy based upon the AA. The purpose of the selected alternative and implementation of the RAP is to protect human health, the environment and attain the RAOs selected for the site in order to meet Track-4 restricted-residential general soil and groundwater standard guidance values (SGVs).

2.0 SITE DESCRIPTION AND HISTORY

According to review of the City of New Rochelle records, as well as a review of historical Sanborn Fire Insurance Maps, the Site was developed as early as 1891 with two residential-use buildings. The property was subsequently redeveloped with a multi-tenant two-story commercial building. The first floor and basement of the building have been utilized by Schmukler's Dry Cleaners since around 1914. This business has historically operated on the first floor and in the basement of the building. Currently, the first floor of the building is being rented by United Community Center owned by Jackie A. The southern portion of the building is currently being rented by Comfort Homes. The second floor of the building provides professional space including: a spa, music studio, taxi cab company, HNJ Realty office and a financial company.

Physical Site Description

Site Name: Schmukler's Dry Cleaners
358 through 364 North Avenue, New Rochelle, New York
Owner: HNJ Realty, LLC
Location: 358 through 364 North Avenue, New Rochelle, New York
Latitude -73.784480", Longitude "40.914176"
Brownfield Cleanup Agreement Site No.: C360088
Index No.: A3-0542-0306

The Site is located at an elevation of approximately 80 feet above mean sea level according to review of USGS Topographic Map, Mount Vernon Quadrangle (Figure 1). The Site consists of a partial two-story/part one-story commercial building on a 0.21 acre parcel identified as the street addresses 358 through 364 North Avenue, New Rochelle, New York. The subject parcel (Site) is located in the City of New Rochelle, County of Westchester. The property is assessed as 0.21 acres in size and improved with a commercial building constructed in 1914. The owner of record of the Site is HNJ

Realty, LLC[1]. An addition was made to the western portion of the building circa 1937. An addition was also made to the southwestern portion of the building sometime prior to 1987. A final addition was made to the northwestern portion of the building (which includes the steam boiler) in 1987.

The Site is located within a mixed commercial/residential use area. Properties along North Avenue are predominantly occupied for commercial use, with some maintaining residential apartments above. Commercial uses dominate areas within one block east and west of North Avenue. Beyond this one block area, residences are the prevailing land-use. The following businesses are located to the north of the subject site on the west side of North Avenue: 366 Real Estate Company; 360 Family Dentistry. Located on the southern side of Lockwood Avenue heading to the west the following businesses are noted: 2 Lockwood, Mattress Dealer; 6 Lockwood, Cabinet Store; 8 Lockwood, LB Inc Swimming Pools.; 10 Lockwood, Modern Press; 12 Lockwood, LBI. Located to the direct west is 17 May Street which is mainly a residential complex. To the south on the west side of North Avenue is Love Music Inc.

2.2 Public Water Supply

Public water is provided to the Site by United Water New Rochelle. No on-site potable or dry cleaning or washing make-up supply wells, active or inactive, were observed during the inspection. According to information provided by United Water, the supply source is surface water that is purchased from the New York City Department of Environmental Protection (NYCDEP). The three sources of the New York City supply that is utilized includes the Croton, Catskill and Delaware Aqueducts. The Central Avenue and little Catskill pump stations supply the day to day demands to the system.

2.3 Surface Water and Hydrogeology

According to the Surficial Geology Map of New York Lower Hudson Sheet produced by the

[1]According to the information provided by the client.

University of the State of New York; State Education Department, 1989, the Site is located within an area of New York where the surficial geology is defined as glacial till. The till is described as variable texture (e.g., clay, silt-clay, boulder clay), usually poorly sorted, which was deposited beneath glacial ice. The till is generally characterized by mixtures of relatively impermeable loamy matrix-to-sandy in areas underlain by gneiss or sandstone. The thickness of the till varies between one and 50 meters.

The Site is located in the eastern portion of the City of New Rochelle and groundwater flow direction could not be determined from published information. As groundwater is not used as a potable water source in the Site vicinity, current groundwater quality data are very limited. No water table elevation maps are available for the City of New Rochelle. However, given both the surface and bedrock topography in the area (which generally slopes down toward the Long Island Sound), groundwater flow in unconsolidated deposits and/or upper weathered bedrock is likely easterly-southeasterly, toward the Long Island Sound. A groundwater flow survey was conducted at the site as part of the supplemental remedial investigation activities utilizing all available overburden wells and bedrock wells. The results of the survey concluded that groundwater appears to be moving in a south-easterly direction.

Due to the heavily developed nature of the immediate surrounding area, groundwater quality is expected to be regionally degraded. No surface water bodies are located on, adjoining or proximate to the Site. Ferris Creek and The Long Island Sound are located approximately 3,250 feet to the east/southeast of the Site. According to Freshwater Wetland, National Wetland Inventory, Westchester Wetlands and Tidal Wetlands data available on the Westchester County GIS System, there are no regulated wetlands on or adjoining the Site.

3.0 SUMMARY OF REMEDIAL INVESTIGATION AND EXPOSURE ASSESSMENT

Historic data collected over the past several years has indicated the presence of chlorinated VOCs and petroleum related VOCs at the subject site in soil and groundwater. The former dry-cleaning

equipment room has been the main source area for chlorinated contamination and continues to be the main focus of our remedial efforts. An SVE/SSDS combo remediation system has been in operation since approximately the winter of 2009 and has been removing volatiles from the sub surface around the clock. The SVE/SSDS system is geared heavily towards the dry cleaning equipment room and the basement. The system also extends to the rear of the building focusing on the former dry-well where substantial PCE was found in GW-9 at 25,000 ppb. Concentrations of PCE have been discovered in GW-4 as high as 830,000 ppb and TCE as high as 58,000 ppb in groundwater beneath the dry-cleaning equipment room. (note: These concentrations are from the August 2007 RI). The active SVE/SSDS system has likely reduced these numbers since the system's inception during the winter of 2009. Please see Figure-3 for historical data discussed above. In December of 2008 MW-3 (located in the equipment room) was sampled and lab data indicated that PCE had a concentration of 26,000 ppb, TCE at 6,000 ppb, DCE at 2,400 ppb and Vinyl Chloride (VC) at 430 ppb. Samples were also collected during November of 2009 from MW-3, just prior to the start-up of the SSDS/SVE system, and PCE was recorded at 75,000 ppb, TCE at 4,000, DCE at 4,100 ppb and VC at 250. Nearly four years later, during August of 2012, PCE concentrations in MW-3 have been reduced to 18,000 ppb, TCE was significantly reduced to 810 ppb, DCE was recorded at 1,400 ppb and VC at just 61 ppb. This is most likely attributed to the active and ongoing SVE/SSDS system installed during the winter 2009 volatilizing VOCs from the shallow water table. The basement area had some levels of PCE detected in groundwater but nothing close to the levels found in the equipment room. A total of three (3) groundwater samples (GW-1, GW-5 and GW-6) were collected from the basement. GW-1 collected in the northeast corner did not detect PCE, GW-6 to the west of this location detected PCE at 310 ppb and GW-5 collected at the center of the southern basement wall detected PCE at 150 ppb. The concentrations in the former dry-cleaning equipment room are far more severe as levels have been discovered at nearly one million parts per billion. Chlorinated VOC levels totaled approximately 10,000 ppb in the basement with the majority of the contamination consisting of DCE (8,700 ppb) in GW-6. Petroleum related contamination has been found throughout the site in groundwater, mainly in the basement and the former dry-cleaning equipment room. Petroleum constituent levels have been detected as high as 890 ppb (1, 3, 5 trimethylbenzene) in the equipment room and 670 ppb (naphthalene). The source of these impacts in unknown. Regardless of the source origin remedial efforts provided in this work plan will address all significant petroleum related contamination at the site.

Specific RI Work Plan tasks were performed to allow a quantitative exposure assessment of the potential exposure pathways identified for the subject property. The findings are as follows: Soil contamination was determined to be limited to below the concrete floor of the former dry cleaning equipment room, within the bottom of the storm drain and below the basement floor. As no direct contact with the shallow subgrade site soils is likely, the primary potential soil contact exposure pathway identified remains during any ground intrusive remedial work. No contact with the shallow site soils is expected under current conditions or in the future, unless the building is renovated in a manner in which the soil is disturbed. Therefore, potential exposure to contaminated subgrade site soils remains if efforts were undertaken to restructure the building exposing these soils. The extent of the soil contamination (SVOC and CVOC) is depicted on Figures - 3c and 3d of this Work Plan. It should be noted that since the collection of the depicted soil sampling locations, the on-going operation of the SVE/SSDS has likely greatly decreased contaminant concentrations.

As actionable groundwater impacts have been confirmed, the need for soil and groundwater remediation is being proposed as the selected alternative for the site. No known local private water supply has been identified proximate to the study site. Therefore, groundwater ingestion has been determined to not be a completed exposure pathway. Unless construction excavation to groundwater occurs, saturated soil contact exposures within groundwater will not be a completed exposure pathway. Sub-slab vapors have been determined to contain VOCs, therefore, mitigation via the previously installed SVE/SSDS combo system has been implemented as a source control of soil/groundwater and soil vapor contamination. While the remediation was performed, soil contact became a temporary completed exposure pathway for, which preventative measures were taken. The extent of groundwater contamination (petroleum and CVOC) is depicted on Figures-3a and 3b.

Elevated VOC concentrations in soil gas confirm that a potential exposure pathway exists to off-site residents to the east, south and north along North Avenue. At this time, the inhalation exposure pathway has not been confirmed and remains a potential exposure pathway. Multiple attempts were made to contact surrounding residents in order to test indoor air but repeated requests were denied.

Groundwater flow has been projected to be toward the Long Island Sound. This distance is more than 3,200 feet away, therefore, a discharge of groundwater to surface water pathway is not considered

a significant potential exposure pathway. After repeated efforts to gain access to possible off-site receptors in order to perform a soil vapor investigation, access was denied during the testing period from the winters of 2008-2013.

4.0 REMEDIAL GOALS AND REMEDIAL ACTION OBJECTIVES

Based upon contamination discovered above regulatory standards for soil and groundwater the following Remedial Action Objectives (RAOs) will apply during the remedial phase in order to conform with Track-4 clean-up requirements in order to protect the environment and public health:

- prevent ingestion/direct contact with contaminated soil
- prevent migration of soil related contamination that would result in groundwater or surface water contamination
- restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable (Division of Water TOGS 1.1.1) with provisions for IC's/EC's in order to prevent on-site potable groundwater use exceeding drinking water standards:
- prevent ingestion of groundwater with contaminant levels exceeding drinking water standards
- remove source of groundwater contamination
- prevent contact with, or inhalation of volatiles, from all contaminated media via the current on-going Interim Remedial Measure (IRM).

Based upon the potential for Soil Vapor Intrusion (SVI) due to groundwater and soil contamination, the following RAOs apply for the protection of the environment and public health:

- mitigate potential impacts to public health resulting from existing, or the potential for, soil vapor intrusion through the use of the currently operational Soil Vapor Extraction (SVE)/Sub-slab Depressurization System (SSDS) (Guidance for Evaluating Soil Vapor Intrusion - October 2006)

An IRM to address vapor intrusion in the form of an SVE/SSDS in order to protect the environment, public health and on-site workers has been developed and approved by the Department on July 23, 2015. An IRM Construction Completion Report (CCR) was issued to the Department during February of 2016.

5.0 DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

The remedy selection evaluation is based on the criterion set fort in DER-10, section 4.2 (b-j) in order to determine the ability of each alternative or remedy to protect public health and the environment. Analysis of each alternative will include how each will eliminate, reduce or control through removal, treatment, containment, engineering/institutional controls, any existing or potential human exposures or environmental impacts identified by the RI.

The detailed analysis of alternatives presented in this chapter consists of information needed to allow for the selection of the most suitable remedy. This approach to analyzing alternatives is designed to provide sufficient information in order to compare alternatives adequately and select an appropriate remedy for the site. The following alternatives will be evaluated with regard to selecting the most practicable remedy for the site: No Further Action, Monitored Natural Attenuation (MNA), Institutional and Engineering Controls (ICs/ECs), Ex-situ Treatment and In-situ Treatment.

5.1 No Further Action

No further action serves as a baseline against which the performance of other remedial alternatives can be compared. At this time, given the current conditions of the soil and groundwater on-site, no further action is not a feasible approach to a remedy. Due to the nature and extent of groundwater contamination discovered throughout the study area and the potential for exposure to nearby receptors via the vapor inhalation pathway, this remedy does not attribute to the protection of public health or the environment. Therefore, no further action is not a recommended alternative for remediation.

Annual Costs:. *$0*

Capital Costs:. *$0*

5.2 Monitored Natural Attenuation (MNA)

Monitored Natural Attenuation (MNA) relies on the natural attenuation processes to achieve site specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods. The MNS process that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil and groundwater media. These in-situ natural processes include: biodegradation, dispersion, dilution, sorption, volatilization, radioactive decay, biological stabilization, transformation or destruction of contaminants.

Although significant breakdown of PCE and daughter breakdown products has been observed at the site without any human intervention, the time and cost for MNA in the long term is not comparable given the significant levels of contamination detected in groundwater. Given the elevated levels of chlorinated contamination discovered on-site and the risk for human exposure to volatilization of these contaminants, MNA is not a recommended alternative for remediation. MNE annual and capital costs for up to ten (10) years are provided below.

Annual Costs:. *$50,000*
Capital Costs:. *$230,000*

5.3 Engineering (ECs)/Institutional (ICs) Actions

Engineering Controls (ECs) include any physical barrier or method employed to actively or passively contain, stabilize, or monitor contamination, restrict the movement of contamination to ensure the long-term effectiveness of a remedial program, or eliminate potential exposure pathways to contamination. Engineering controls include, but are not limited to, pavement, caps, covers, subsurface barriers, vapor barriers, slurry walls, building ventilation systems, fences, access controls, provision of alternative water supplies via connection to an existing public water supply, adding

treatment technologies to such water supplies, and installing filtration devices on private water supplies.

ICs are non-physical means of enforcing a restriction on the use of real property that limits human or environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of site management activities at or pertaining to a site.

Currently, an active SVE/SSDS is operating to ensure the protection of the building's occupants. The EC associated with the system is a 5.0 HP EN-6 ROTRON explosion-proof blower. The EC is responsible for removing harmful vapors emanating from the sub-surface soil/groundwater and depressurizing the buildings sub-grade basement floor.

The SVE/SSDS has been designed with two (2) horizontal h-pattern units (SSDS) constructed of 2" PVC slotted well screen, installed below the basement floor within two separate rooms. H-pattern piping is manifolded together before it routes to the main manifold located on the opposite wall of the recovery room. The SVE portion of the system consists of four (4) sub-grade vapor extraction wells located in the area of the former dry-cleaners and one (1) in the area of the sub-grade drywell. All piping is connected to the main manifold where it enters the recovery room and is connected to the EC, which discharges through a series of carbon vent scrubs before exhausting to the atmosphere. Discharge to the atmosphere and operation of the system is regulated by the Westchester County Department of Health (WCDOH).

Under the direction of the WCDOH, Operation, Maintenance and Monitoring (OM&M) of the system includes: quarterly effluent vapor sampling (of the in-line sample ports and stack exhaust) to ensure that the system is in compliance with the WCDOH air emission source permit. During routine maintenance the following activities are performed:

- A visual inspection of the complete system (blower vent fan, piping, warning device, etc.);

- Identification and repair of leaks; and
- Inspection of the exhaust or discharge point to verify no new air intakes have been located nearby

As necessary, preventive maintenance (e.g., replacing vent fans), repairs and/or adjustments will be made to the system to ensure its continued effectiveness at mitigating exposures related to soil vapor intrusion. The need for preventive maintenance will depend upon the life expectancy and warranty for the specific part, as well as visual observations over time. The need for repairs and/or adjustments will depend upon the results of a specific activity compared to that obtained when system operations were initiated. If significant changes are made to the system or when the systems performance is unacceptable, the system may need to be redesigned and restarted. In addition to the routine OM&M activities described here, the building's owner and tenants have been given information packages that explain the systems operation, maintenance and monitoring. Therefore, at any time during the systems operation, the building's owner or tenants may check that the system is operating properly. An IC will be established in the form of an environmental easement preventing the removal of the interior concrete floor (first floor and basement) in order to maintain the operation of the EC and the associated SVE/SSD system below the floor.

The site cap/cover is an additional EC at the site in place to prevent exposure to soil vapor contamination and prevent the potential for a soil contact exposure pathway. As part of the environmental easement, an IC has been established to prevent the removal of the site cap/cover. The easement also includes: provisions to maintain the site cover (see sect 7.3)/ concrete floor EC within the building. Areas of the site that exhibit exposed surface soils will require, via the Track-4 clean-up track, that the top two feet (2') of exposed surface soils shall not exceed restricted-residential-use SCO's. Additional ECs/ICs required to manage remaining contamination at the site are discussed in the site's SMP. The following annual and capital costs to maintain the ICs and ECs for up to five (5) years are provided below.

Annual Costs. *$12,000*
Capital Costs. *$75,000*

5.4 Ex-situ Treatment (Pump and Treat)

Pump and Treat technology is a common form of groundwater remediation often associated with treatment technologies such as Air Stripping and Liquid Phase Activated Carbon Adsorption. Contaminated groundwater is pumped from the ground with the use of a submersible pump allowing extracted groundwater to be purified through a series of vessels that contain materials designed to adsorb the contaminants from the groundwater. Groundwater pump and treat technology is often best used where floating product is observed, due to its ability to alter the hydraulic gradient in the sub-surface. The pumping of groundwater forms a cone of depression at the surface of the aquifer, subsequently drawing the floating product to the recovery well.

Despite the fact that there was no observed floating petroleum observed on-site during the site RI activities, the nature of the sub-surface in the study area poses the largest issue with regard to proposing this technology as a feasible alternative. The hydrogeological makeup of the site consists of a water table surface that fluctuates between the surface of the bedrock (~11' bgs) and the lower portion of the overburden (~10-11' bgs). Based upon routine groundwater sampling activities conducted throughout the site, very low groundwater recovery due to low permeability soils/bedrock and very slow recharge of groundwater make this a less than desirable approach for remediation of groundwater.

Pump and treat technology often takes many years to obtain clean-up goals and the costs from these efforts (long-term monitoring, maintenance of equipment, permitting, off-site storage access, disposal and discharge) can far exceed many other available technologies. Based upon all these factors, along with the chemicals of concern (DNAPL constituents making them difficult to recover at multiple depths) the Pump and Treat technology is not recommended as an alternative for remediation. The following annual and capital costs are provided for an anticipated five (5) year time frame below:

Annual Costs:. *$122,000*
Capital Costs:. *$731,000*

5.5 In-situ Treatment

In-situ treatment involves chemical or biological methods for reducing contaminant concentrations or bio-availability without first removing the contaminated media (soil or groundwater) of concern. The following in-situ treatment methods will be discussed: air stripping (air sparging with soil vapor extraction) and Enhanced Bioremediation.

5.5.1 Air Sparging

Dissolved-phase chlorinated solvents can be effectively removed via air sparging; however, rapid initial rates of contaminant removal are followed by a protracted period of lower removal rates, or a tailing effect. As the air flow rate increases, the rate of contaminant removal also increases, especially during the initial stages of air injection. Increased air injection rates will increase the density of air channel formation, resulting in a larger interfacial mass transfer area through which the dissolved contaminant can partition into the vapor phase. Air sparging can also reduce groundwater flow and subsequent downgradient contaminant migration as the increasing air saturation can reduce the relative hydraulic conductivity (K value). This technology is usually coupled with soil vapor extraction (SVE) in order to remove the soil gas generated in the vadose zone from the resulting influx of air into the contaminated aquifer.

As with the pump and treat technology, the sub-surface lithology and the dynamics of the underlying formation do not appeal to the quality performance of this in-situ method.

This as well as the issue that the point source area lies beneath the building making access for well installations, piping, etc., associated with installation very difficult with conventional drilling/boring equipment. The addition of such a system would also largely hinder current business operations and possibly cause destruction to the newly renovated interior.

Long-term operational costs associated with this technology are also of concern, along with the cost to monitor and maintain the equipment for several years. Initial costs incurred to employ this technology are also an issue, as a new well network would need to be installed in order to properly treat the area of concern. Annual and capital costs are listed below for an anticipated five (5) year operational period followed by five (5) years of monitoring. Based upon the above mentioned, the air sparging technology is not recommended as an alternative for remediation.

Annual Costs. *$55,000*
Capital Costs. *$610,000*

5.5.2 Enhanced Bioremediation

Biodegradation is the chemical dissolution of materials by bacteria, fungi, or other biological means. This section will cover the alternative of enhanced biological degradation including: the application of microorganisms, nutrients, and/or other electron acceptors into the groundwater using fixed or temporary injection wells. This technology has the ability to reduce exposure to contamination by reducing toxicity, mobility and volume of contamination, in turn protecting human health and the environment. Implementation of this technology will not be an issue as it may be the most suitable approach to remediation given the fact that a small scale pilot study has already been implemented and confirmed successful in reducing contaminant concentrations. Given the fact that a pilot study has already been implemented proving the effectiveness of the selected product, actual product cost, monitoring for the remainder of the year (at least two quarters post installation) and the relatively ease of use and safety, enhanced biological bioremediation is the desired alternative for remediation.

The following annual and capital costs associated with implementing this technology are listed below.

Annual Costs:. *$25,000*
Capital Costs:. *$50,000*

5.5.3 RegneOx

RegenOx™ is a proprietary in-situ chemical oxidation process using a solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel). RegenOx™ with its catalytic system has very high activity, capable of treating a very broad range of soil and groundwater contaminants including both petroleum hydrocarbons and chlorinated solvents. Additionally, RegenOx™ has significant longevity in the subsurface allowing for both the initial contaminant degradation and the continued treatment of contaminants desorbing from the matrix. Most importantly, RegenOx, when handled appropriately, is safe and easy to apply to the contaminated subsurface without the health and safety concerns and lingering environmental issues that have become associated with other chemical oxidation technologies.

RegenOx™ can be added to excavations, soil piles using soil blending equipment and directly to groundwater via injection wells. Once in contact with contaminated media, RegenOx™ produces an effective oxidation reaction, comparable to that of Fenton's Reagent, without a violent exothermic hazard. The most aggressive approach using chemical oxidation is to maximize contact between RegenOx™ and the contaminated media.

Based on the ability for RegeOx to eliminate and/or reduce potential human exposures and impacts to the environment and given it's relatively cost effectiveness, RegenOx is deemed as a suitable remedy for the site, but is not recommended. Please see below for the anticipated annual and capital costs to implement this remedy.

Annual:. *$30,000*
Capital:. *$193,500*

6.0 RECOMMENDED REMEDY

The following section provides information on the selected remedy (Enhanced Bioremediation) for the site. The selected remedial measure is expected to meet the RAOs established for the site, to the extent feasible, and also reduce the potential for human exposure to contaminated media.

6.1 Microbial(Bac-t) and Nutrients

The proposed remedial measure to be undertaken at the subject property involves treatment of chlorinated VOCs through the process of enhanced biodegradation. The use of bacteria (microbes/bac-t or M-1000H®) and Tri-Phasic®12 (nutrients), is proposed to help stimulate the degradation process where the proper naturally occurring microbes may be lackluster or nonexistent. The applied microbes will produce enzymes that break down petroleum products and halogenated compounds, digest them, utilize them as a food source and after they've broken it all down, they die off. This remedial method of introducing bac-t and nutrients to a contaminated aquifer has been widely recognized by the environmental industry throughout the United States when treating hydrocarbon and chlorinated solvent spill incidents.

In order to deliver the biological mixture to the sub-surface, a series of available monitoring wells will be utilized in the areas of concern. A Pilot Study using the existing monitoring wells was previously performed at the Site, which included the use of the above mentioned biological solution focusing on the treatment of both chlorinated VOCs and petroleum related SVOCs via enhanced bioremediation.

6.2 Overall Protectiveness of Public Health and Environment

The M-1000H® with the Tri-Phasic®12 (nutrients) has the ability to eliminate and/or reduce potential human exposures and impacts to the environment by degrading chlorinated/petroleum contamination to safe bio-products (ethene, CO2 and water). The elimination of groundwater contamination to applicable standards will reduce the potential for soil vapor intrusion within local businesses and residences.

6.3 Standards, Criteria and Guidance

The remedy is expected to conform with the standards and criteria for groundwater set forth in the TOGS ambient groundwater standards document by reducing chlorinated contamination levels to within the standards discussed in section 4.0.

6.4 Long-term Effectiveness and Permanence

Evaluating the long-term effectiveness and permanence of the remedy after the implementation of the remedy will be based upon monitoring and sampling results post remedy installation for at least two (2) sampling events following remediation. Remaining contamination at the site after the selected remedy has been implemented, will be managed under the SMP developed for the site. Residual soil/groundwater impacts to remain on-site after completion of the remedy will require the use of long term ECs/ICs established for the site as discussed in the SMP.

6.5 Reduction of Toxicity, Mobility and Volume

The ability of the remedy to reduce toxicity, mobility or the volume of contamination is well documented within the industry. Toxicity levels will be reduced through degradation of SVOCs,

PCE and associated daughter breakdown products to non-toxic compounds (i.e. carbon dioxide, ethene). Stabilizing the plume preventing mobility of contamination is already being achieved via the on-going SVE/SSDS, which is preventing the migration of soil gas within the building and off-site areas. Reducing the groundwater toxicity levels via degradation and preventing further migration of contaminants will eventually lead to an overall reduction in contaminant mass. Please see Attachment-B for a laboratory case study utilizing the selected biological product.

6.6 Short-term Impact and Effectiveness

Short-term impacts resulting from implementing the remedy will include potential exposures to nearby receptors as a result of ground intrusive activity. Application at well points will each require ground intrusive work, for which a community air monitoring plan (CAMP) will be deployed to monitor up-wind and down-wind conditions in order to limit exposure to nearby receptors. Monitoring of the interior air within the site building will also be conducted during remedial activities as the SVE/SSDS will temporarily be shutdown during the application procedure.

6.7 Implementability and Cost Effectiveness

Technical feasibility including any difficulties associated with construction and the ability to monitor the effectiveness of the remedy will not be an issue. The aspects associated with implementing the remedy include: breakdown and setup of remedial equipment/products, CAMP deployment and indoor air monitoring during the application. None of the aspects listed above pose any anticipated difficulties with regard to implementing the remedy. Monitoring the effectiveness via groundwater sampling from monitoring wells does not pose any additional technical difficulties. Administrative feasibility including the availability of necessary personnel, materials, access for implementation and operating approvals do not pose any foreseen difficulties in the future.

6.8 Land-use and Community Acceptance

The land use criterion, which includes evaluating the current and future use of the site, as it relates to the remedy, is currently categorized for restricted-commercial use. Current site use is as a United Community Center of Westchester. The future use of the site is intended to remain the same as a community center facility with no plans for re-development in the near future. The surrounding area is currently zoned as mixed commercial/residential-use with residential apartment housing to the west, businesses/strip stores to the north, east and south of the site. The final use determination for the site, based on the ICs and ECs to be established will be restricted-commercial.

No federal or state historical or heritage sites including Native American religious sites are located nearby. No wetlands are in the vicinity of the site with the nearest major body of water, the Long Island Sound, located approximately 0.75 miles east/southeast of the site. The site is not located within any recognized flood plain areas as characterized by the Federal Emergency Management Agency (FEMA).

Community acceptance will be evaluated after the public comment period used to present the final AA/RAP as part of the final DER approval process of the remedy and issuance of the Decision Document (DD). Based on the ability of the proposed biological solution to eliminate and/or reduce potential human exposures, impacts to the environment and given it's cost effectiveness, the selected alternative is deemed as a suitable remedy for the site.

7.0 REMEDIAL ACTION PLAN (RAP)

7.1 Enhanced Biological Remediation

The following section discusses the implementation of the proposed selected alternative for remediation of soil and groundwater, which includes the following information: well point locations, application procedure, dosage amounts, product information, health and safety, community air monitoring and effectiveness monitoring.

7.1.1 Application Well Locations and Specifications

Selected existing monitoring wells (MW-3,9-12) already installed at the site will be utilized for the application procedure. Surrounding monitoring wells (MW-1, 2, 7 and 8) will be utilized to monitor the application process further discussed in section 7.3.

Specifications on the following wells utilized as application wells are as follows: MW-3- 8' of 2" diameter PVC riser pipe with 5' of 2" diameter PVC slot screen; MW-9 and MW-10 - 10' of (1") PVC riser pipe and 5' of (1") PVC 0.02" slot screen; MW-11- 2' of 2" PVC 0.02" slot screen, 3' of 2" PVC riser to grade and MW-12- 2' of 2" PVC 0.02" slot screen, 4' of 2" PVC riser to grade. Each well was installed with a 2' bentonite seal above the screened interval and finished at grade surface with a 5" stainless steel manhole cover, cement sealed to prevent surface water infiltration. Please refer to Figure- 4 for the locations of the intended application wells and monitoring wells. Well logs are attached as Figures-5-7.

7.1.2 Dosage Quantities

The bac-t and nutrients are proposed to be applied in multiple areas including: the former dry cleaning equipment area, the impacted dry-well area and the southwestern basement area.

Treatment Area	M1000H (bac-t)	Nutrient/H2O Mix	Number of Applications
Former Dry Cleaning Equipment Room (MW-3)	10 gallons M1000H	40 gallon nut./h2O	1 application event

Upgradient wells (MW-9 and MW-10)	5 gallons M1000H	20 gallon nut/h2O	1 application event
Basement wells (MW-11 ans MW-12)	5 gallons M1000H	20 gallon nut/h2O	1 application event

7.1.3 Application Procedure

In order to apply the bac-t and nutrient mix to contaminated areas, existing wells MW-3 and MW-9-12 will be utilized to introduce the bio solution to the impacted sub-surface areas. A small submersible pump will be connected to a clean 3/8" piece of poly-tubing, which will be used to draw the bacteria solution from a small holding container. The tubing will be lowered to the bottom of the well at which point the pump is turned on subsequently dispersing the bacteria into the sub-surface at a very low flow rate. The minimal pressure generated from the pump allowed for the solution to disperse vertically and laterally throughout the contaminated aquifer and vadose zone. The nutrient mix is prepared separately (1 gallon of nutrients mixed with 55-gallons of water) and applied in the same manner as the bacteria, at a low flow rate. Please see Figure-4 for the proposed application areas. During the application event the SSDS/SVE system will be temporarily shut-down for which specific monitoring requirements will be followed as discussed in section 11.0.

7.1.4 Application Monitoring

Before, during and post application of the bacteria and nutrient installment, nearby monitoring wells (MW-1, 2, 6, 7, 8, BW-2) upgradient and downgradient will be gauged for DTW (approximately every five (5) minutes) to ensure that the water level does not rise too quickly. DTW readings will be gauged pre, during and post application for changes in elevation.

7.1.5 Chemical Handling, Staging and Storage

The M1000H and nutrients will be stored off-site, at our facility, prior to the application

event. These products are natural, non-pathogenic, non-engineered biological products that meet the Environmental Protection Agency (EPA) requirements for release into the environment. Special clothing or equipment is not required for handling M1000H and nutrients. Please see Attachments-A, C and D for company information and cut sheets on the proposed product.

7.1.6 Alternative Remedial Measures

In the event the remedy does not produce the anticipated results, a liquid carbon source (PlumeStop®) in order to reduce contamination levels and also lower DO levels throughout the plume in order to alter the sub-surface environment to reflect anaerobic conditions. Please refer to specifications/product information as Appendix-H. While adding a carbon source will help to degrade the oxygen levels within the sub-surface, promoting a more anaerobic environment, this in-situ remedial technique promotes sorption of groundwater contamination and also enhances bio-degradation by dispersing throughout the plume when applied. When the reagent is applied to the sub-surface, target contaminants partition out of the aqueous phase and sorb onto the liquid activated carbon matrix, thereby removing mobile contaminants from the immediate risk pathway. In the event that additional injections are needed, dosage quantities, application rates and locations will be outlined within the SMP for the site.

The site's sub-surface conditions indicate an anoxic (only bound oxygen present) environment based upon groundwater data collected as part of pre-application sampling, which included testing for key parameters such as DO and ORP. Currently, DO levels are in the range of 1.0-5.0 ppm, which is relatively high despite the low ORP levels (-105–130) within the remedial areas of MW- 3, MW-11 and MW-12. The overall goal as part of the remediation strategy is to closely monitor for anaerobic conditions while anticipating the introduction of the proposed carbon catalyst if the results of the post-remedy application are less then favorable. Additional information on the testing and monitoring parameters is discussed in section 8.3-Monitoring Degradation Parameters.

7.2 Interim Remedial Measure as part of RAP

The IRM implemented includes both mitigation and remediation of the soil and groundwater conditions underneath the basement concrete slab and the former dry cleaning equipment room. The installation of an active Soil Vapor Extraction (SVE) / Sub-Slab Depressurization System (SSDS)

has been installed to accomplish soil gas, soil and to some extent groundwater remediation. The continued operation of the IRM as part of the overall remedy for the site is discussed below. Installation construction occurred during November and December of 2008. Pilot testing of the system was conducted during February 2009. The official start-up date for the SVE/SSDS is June 16, 2010.

7.2.1 Soil Vapor Migration Pathways

Typical soil vapor migration pathways include entrance into a building through cracks or perforations in the slab or walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. The vapor movement is primarily a result of a difference between interior and exterior pressures. As established in the NYSDOH Vapor Intrusion Guidance, October 2006, the basic requirements that must be established with respect to a soil vapor mitigation program are as follows:

- Pilot Testing, Installation and design of mitigation system;
- Post-mitigation testing;
- Operation, maintenance and monitoring of mitigation systems and;
- Termination of mitigation system operations

7.2.2 Methods of Mitigation

The most effective mitigation methods for soil vapors include a combination of sealing any infiltration points and actively manipulating the pressure differential between the building's interior and exterior. The Soil Vapor Extraction/Sub-slab Depressurization (SVE/SSDS) system installed at the site has accomplished both soil gas mitigation and remediation of contaminated media.

7.2.3 Sealing of Infiltration Points

The interior area(s) identified as requiring mitigation has been further inspected as to the integrity and condition of the poured concrete floor and any utility or other perforation or penetrations into the subgrade surface. The basement contains a pit and other small scale penetrations through the floor that have been sealed with plexiglass and cement covers. As part of the IRM activities, all cracks and “sealable” penetrations have been sealed utilizing hydraulic cement or equivalent sealing material. All joints, cracks and other penetrations of

slabs, floor assemblies and foundation walls below or in contact with the ground surface have been sealed with materials that prevent air leakage. All areas were sealed prior to the pilot test or any other testing performed at the property in order to limit the generation of misleading site data

7.2.4 Buildings with a Basement

Knowledge of the building's foundation design was essential to determine the appropriate method to use for soil vapor mitigation. The building has been identified as possessing a basement with a poured concrete floor construction. In conjunction with sealing potential subsurface vapor entry points, an active Sub-Slab Depressurization System has been installed within the basement of the building, in addition to four SVE wells within the main level (rear) of the building and within an exterior drywell structure . Specifically, a horizontal-laid SVE (H-pattern) that is functioning as a Sub-Slab Depressurization System (SSDS) has been installed within the basement of the building to mitigate soil/ soil vapors. The horizontal H-pattern system had to be installed within the basement due to the close proximity of groundwater within 3-3.5 feet below the basement slab. The horizontal PVC slotted pipes have been set within one foot sub-grade of the concrete floor, via trenching, in a gravel-based bed. Three conventional vertical SVE wells were installed within the slab-on grade rear portion of the building (former dry-cleaning equipment room). One exterior SVE well has been installed in the footprint of the drywell located adjacent to the rear building wall. This drywell was clearly identified during the prior RI as being impacted from former site

operations. An overflow drywell possibly associated with same could not be identified during the RI.

The most common approach to achieving the depressurization beneath the slab is to insert the piping through the floor slab into the crushed rock or soil underneath (i.e., essentially creating a vacuum beneath the slab) and vent to the atmosphere. However, at this property, an active SVE/SSDS system acts to both depressurize and remediate the shallow soils underneath that have been confirmed to possess VOC impacts. The combined SVE/SSDS uses a vacuum blower and piping to draw vapors from the soil beneath the building's slab. This system uses high flow rates, induced vacuum or both to collect and remove contamination. The SSDS/SVE system has resulted in lower air pressure in the sub-slab, relative to indoor air pressure, which has served to prevent the future infiltration of sub-slab vapors into the building, in addition to actual mitigation of soil contamination that is giving

rise to soil vapors.

7.2.5 Remedial SVE/SSDS Design

Given the size and shape of the basement, the horizontal piping has been constructed in an elongated "H" pattern. The legs of the "H" are two sets of 2-inch, schedule 40 PVC, 0.02 inch slotted pipe approximately 30 feet long. These two sets of pipes are connected and manifolded via solid 2-inch PVC riser. This resulted in two sets of 60 feet (total of 120 feet) of slotted screen piping, traversing the entire width of the basement, offset by a distance of approximately 30 feet. The horizontal screened piping has been manifolded together via solid PVC piping mounted to the interior wall located in the center of the basement. Each H-pattern unit contains a manifold consisting of two (2) sampling ports in order to isolate monitoring at select areas of the basement. Gate valves affixed to each manifold allow for the levels of influence in a particular area to be adjusted according to contamination levels.

The solid pipe from the basement passes through a moisture separator before joining up with the manifolded piping from the three vertical, schedule 40, SVE wells located in the former dry-cleaning equipment room. At that point, the piping exits at the rear of the building to an effluent air treatment system. The one exterior SVE well installed in the drywell location was also connected to the SVE system. Access/sampling ports have been installed on the main manifold to allow for monitoring/evaluating the effectiveness of the system.

The solid SVE riser piping has been extended from the main manifold, where the blower unit is located, in a shed unit at the rear of the building. The PVC piping has been connected to the blower intake using non-collapsible flexible ductwork. Non-collapsible hose has been connected to the blower outlet or exhaust to form an air emission treatment system using vapor phase carbon canisters.(Appendix-E for hose specs 1ZLR2) Schedule 80 PVC connects the carbon units to the schedule 40 PVC exhaust stack. In-line sample ports and airflow gauges have been installed at locations along the exhaust piping prior to and subsequent to the air emission treatment system to evaluate the concentration of VOCs being discharged. Ultimately the effluent air stack extends to a height of approximately 10 feet above the highest neighboring roofline. The exhaust point is located away from the openings of other buildings and HVAC air intakes. See Appendix-D for P.E as built drawings of the SVE/SSDS system.

In addition to the NYSDEC and NYSDOH requirements, the Westchester County

Department of Health has been contacted and a permit for the air discharges associated with the SSDS/SVE has been applied for and accepted. On November 29, 2010 the WCDOH issued a renewal CTO (certificate to operate) which is valid until November 29, 2013. Revised permits have recently been renewed and updated for continued operation from 2013-2016 and recently renewed for 2016-2019. Relevant correspondence, monitoring requirements and the renewed permit is attached as Appendix-C.

The engineering control and power source of the system is a 5.0 Hp EN 6 ROTRON explosion-proof blower, formerly a 3.0 Hp EN 656 ROTRON. See Appendix-A for blower specs. This unit is used to create the vacuum for the SVE/SSDS system. The blower unit has been wired to an existing electric sub-panel and operated by a control box located in a secure area of the building. An alarm or system fault light has been installed to indicate times that the system becomes inoperable due to equipment malfunction or power outages. The alarm is located in an area readily visible to the building occupants. Venting in the form of door louvers have been installed to reduce heat within the control room shed. See Appendix-F for pictures of vents. A pressure gauge has also been included as a supplemental warning device of system malfunction or failure. See Appendix-B for a photographic log of the system installation.

7.2.6 Pilot Testing of SVE/SSDS

A one-day pilot-test of the sub-slab beneath the basement floor has been conducted and the data results are positive. The objective of the pilot testing was to establish the radius of influence (ROI) for the SVE system. The pilot test has been conducted via six small diameter shallow soil sub-slab permanent vapor wells (PV). Four have been installed within the basement (PV-3-6) and two within the former steam-press and dry cleaning equipment rooms (PV-1-2) . Specifically, the PVs in the basement are at an approximate distance of fifteen feet away from the legs of the "H", installed approximately one foot deep within the poured concrete floor. Two PVs have been set inside the footprint of the "H" and two PVs to the east of the "H", toward North Avenue. Two additional PVs have been installed 15-20 feet (north-south) radial distances from the three SVE wells in the former dry cleaning equipment room. The PV monitoring points have been used to record pressure responses during the pilot test as per the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York. (NYSDOH, 2006) and the Radon Mitigation Standards (USEPA 402-R-03-078).* These PVs can also be used if necessary during other key phases of the project to check both on pressure as well as VOCs in soil gas. PVs are also referred to as SSVWs (Sub-Slab Vapor Wells)

A rotary coring tool was used to penetrate the concrete floor slab (in the basement and the first floor) to install ½ inch diameter PV monitoring points to an approximate depth of one foot below the concrete. These wells were installed as permanent points as per the NYSDOH guidance. A 3/8-inch diameter polyethylene tubing was affixed to the permanent soil vapor screen point which was installed to within one inch of the bottom of the hole at these monitoring locations. A permanent seal between the tubing and the concrete sub-floor was used to ensure that no air leaks are possible at the vacuum measuring point.

Air pressure (vacuum) measurements have been recorded at each of the six PV or SSVW monitoring points just before the start of each test to ensure that baseline sub-slab air pressures were within normal ranges. Air pressure measurements continued approximately once every 10 minutes while applying a continuous vacuum to the SVE/SSDS system. Air pressure has been measured with a Dwyer Magnehelic® vacuum meter, calibrated to atmospheric pressure prior to the test. The test has been run utilizing the Rotron blower, with the equivalent vacuum reading of 6 in/h2O and a vacuum flow rate of approximately 80 cubic feet per minute (CFM).

The first test period was conducted until equilibrium conditions were established and completed. BEI conducted vacuum readings on each of the permanent vapor points (PV-1-6) in order to establish the system radius of influence or ROI. CFM and PID readings were measured from the vertical SVE wells (V-1-5) to ensure proper airflow and VOC concentrations. The following table below displays all data recorded during the pilot test:

Wells	***Vacuum***	***CFM***	***PID (ppm)***
PV-1	***0.1 in/H_2O***	***n/a***	***0.0***
PV-2	***0.2 in/H_2O***	***n/a***	***0.0***
PV-3	***.16 in/H_2O***	***n/a***	***2.8***
PV-4	***.76 in/H_2O***	***n/a***	***3.9***
PV-5	***0.1 in/H_2O***	***n/a***	***0.0***
PV-6	***.48 in/H_2O***	***n/a***	***0.0***
V-1	***4.1 in/H_2O***	***44.9 ft^3/min***	***538***
V-2	***4.3 in/H_2O***	***48.42 ft^3/min***	***170***
V-3	***4.5 in/H_2O***	***44.35 ft^3/min***	***28.7***
V-4	***4.0 in/H_2O***	***50.88 ft^3/min***	***0.1***

V-5	***3.5 in/H_2O***	***43.52 ft^3/min***	***26.5***

*n/a not available

The radius of influence appears to be approximately 15 feet from the center of each SVE well installed at the site. In the basement area impacted soils can be effected as far away as 15' from any point on the screened piping being that it is installed horizontally.

7.2.7 Post Installation Testing

Routine airflow and concentration sampling of the SVE system has occurred on a monthly basis and BEI staff has collected airflow and bulk air concentration data over the last few years. Airflow calculations for the SVE are generated using inline airflow rates and concentration data collected near the SVE well. In order to collect air concentration measurements, total VOC measurements have been measured with a Photoionization detector (PID) via a sample port installed in the solid PVC piping.

A database has been generated to store all data acquired during monitoring/sampling event. Quarterly reports to the Department include routine airflow and VOC concentration data collected during each monitoring event. Reports also detail any system repairs or alterations that occurred between sampling events. Generally, no continued indoor air quality monitoring is required because the system has been installed properly and is maintaining a vacuum beneath the entire slab. Drastic VOC reduction has been recorded since the early stages of the system's operation. This has led to a reduction in monitoring frequency approved by the Department. See Appendix-G for the frequency reduction letter.

7.2.8 Operation, Maintenance and Monitoring of SVE/SSDS

Based upon the mitigation system implemented at the site, the operation, maintenance and monitoring (OM&M) protocols for the system have been set forth in a site-specific OM&M plan. Subsequent to the initial installation and start-up of the system, weekly monitoring was conducted to evaluate the effectiveness of the system, as well as to ensure that the emission control system was operating effectively. Monthly vapor sampling (of the in-line sample ports) has been conducted to ensure that the system is adequately remediating VOC-impacted soils.

Routine maintenance has been conducted on a monthly basis with quarterly reporting being issued to the NYSDEC and WCDOH.

During routine maintenance, the following activities are conducted:

a. A visual inspection of the complete system (e.g., vent fan, piping, warning device, labeling on systems, etc.);

b. Identification and repair of leaks; and

c. Inspection of the exhaust or discharge point to verify no air intakes have been located nearby.

As necessary, preventive maintenance (e.g., replacing vent fans), repairs and/or adjustments are made to the system to ensure its continued effectiveness at mitigating exposures related to soil vapor intrusion. The need for preventive maintenance depends upon the life expectancy and warranty for the specific part, as well as visual observations over time. The need for repairs and/or adjustments depends upon the results of a specific activity compared to that obtained when system operations were initiated. If significant changes are made to the system or when the system's performance is unacceptable, the system may need to be redesigned and restarted.

Operation and maintenance of the SVE has also been performed by BEI, which consists of observation and documentation of system component operations and conditions. BEI has established a point of contact with the property manager in the event that the system becomes inoperable ("system fault condition"). If a major repair requires the system to be offline for longer than a 24-hour period, the representative of the owner will contact the NYSDEC to discuss the problem and offer a schedule for repair.

In addition to the routine OM&M activities described herein, the building's owner and tenants have been given information packages that explain the systems operation, maintenance and monitoring.

Therefore, at any time during the systems operation, the building's owner or tenants may check that the system is operating properly.

On July 13, 2012 BEI replaced the original 3 Hp Rotron blower with a 5 Hp Rotron blower. The original 3 Hp blower exhibited internal catastrophic failure as a result of normal "wear and tear." Typically these blowers only last 2 -3 years due to the strenuous nature of continuously running 24 hours a day seven days a week.

7.2.9 Termination of SVE/SSDS Operations

The SVE will not be turned off without prior approval from the State and WCDH (if necessary), except in emergency situations. The SVE will remain operational until it is no longer needed to address current or potential exposures related to soil vapor intrusion. Termination of the mitigation system will comply with the procedures discussed in the NYSDOH guidance and with NYSDEC and NYSDOH concurrence. A petition for the termination of the SVE operation would be based upon the following:

a. Residual subsurface sources of contamination, if any, of VOCs in subsurface vapors have been remediated based upon an evaluation of appropriate post-remedial sampling results;
b. Residual contamination, if any, in subsurface vapors is not expected to affect indoor air quality significantly based upon indoor air, outdoor air and sub-slab vapor sampling results;
c. Residual contamination, if any, in subsurface vapors is not expected to affect indoor air quality significantly when the SVE is turned off based upon indoor air, outdoor air and sub- slab vapor sampling results at representative structures: and
d. There is no "rebound" effect that requires additional mitigation efforts observed when the SVE system is turned off for prolonged periods of time. This determination is based upon indoor air, outdoor air and sub-slab vapor sampling from the building over a time period, which will depend upon site-specific conditions.

BEI will work with the property owner to make such a determination if any one of the above conditions has been satisfied and both the NYSDEC and NYSDOH will be petitioned on this matter for concurrence prior to system termination.

7.3 Site Cap/Cover System

Exposure to existing/remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of 24 inches of clean soil, asphalt pavement, concrete-covered sidewalks, and concrete building slabs, add other components as appropriate.

7.3.1 Confirmation Sampling of Exposed Surface Areas

Site cover confirmation soil samples were collected from the exposed surface soils (rear yard grassy area) and raised garden beds in order to ensure that this exposed area in the backyard contains two (2') feet of soils meeting Restricted Residential SCOs (Part 365 6.8 (b)). Please refer to Figure-8 for the locations of the site cover soil samples. Results are pending validation, but preliminary results indicate the need for removal or cover of all exposed areas. Maintaining the site cap/cover is discussed within the SMP for the site and includes provisions for soil removal within the Excavation Work Plan (EWP) attached to the SMP.

7.3.2 Sampling Procedure

Discrete soil samples were collected from select locations depicted on Figure-8 with the use of a Geoprobe-manual slide hammer to a depth of two (2') feet below the exposed site cover surface. Samples were collected in accordance with the NYS DEC soil screening guidance (August 2017 Draft) and included samples collected from the following intervals: VOCs at five (5) locations based on < 1 acre of exposed surface from 2-6" and 12"-24" (total 10 samples) and for inorganic and SVOC chemicals, one (1) five point composite from depths 0-2", 2-12" and 12"-24" (total 3 composite samples).

Sampling equipment was decontaminated between sampling locations with a phosphate free, Alconox and water mixture. Soil samples were properly containerized in laboratory approved glassware and submitted for analytical under the test methods discussed below and compared to the Restricted Residential SCOs {Part 365 6.8 (b)}.

7.3.3 Analytical Procedure

All samples were submitted to a New York State approved ELAP certified laboratory for testing according to Part-375 6.8(b) by the following methods in order to comply with site cover requirements for restricted residential site use: TAL metals by USEPA Method 6010, for pesticides/herbicides by EPA 8081B and 8151A, PCBs by USEPA Method 8082A, VOCs by USEPA Method 5035A (purge and trap), and SVOCs by USEPA Method 8270BN.

7.4 Light Non-Aqueous Phase Liquid (LNAPL) Recovery

LNAPL recovery, collection and disposal from wells on the southeastern portion of the site (W-5, MW-11, MW-12) and immediately off-site in the direction of groundwater flow (BW-4) to remove and prevent potentially mobile petroleum in the sub-surface from migrating off-site. It is anticipated that petroleum-based LNAPL will be collected from shallow groundwater present at approximately 10-12' below ground surface. LNAPL will be collected periodically, as discussed below in section 7.4.2. If large quantities of LNAPL are accumulated within wells containing product, additional recovery methods or wells will be evaluated. Additional remedial actions may also be required based on the performance of the initial wells, new information, or a documented change in conditions.

7.4.1 Recovery Method and Locations

In an effort to remove LNAPL and prevent further migration of such, bailing of free phrase product is proposed to be conducted on a quarterly basis. Also proposed is the installation GeoSorb product recovery sock, which will collected any LNAPL that accumulates prior to the bailing event. Please refer to Appendix-I for the specifications of the product recovery sock. Recovery socks will be placed in wells MW-3 and at down gradient locations MW-5, MW-11, MW-12 and BW-4. Please refer to Figure-9 depicting the LNAPL recovery locations.

7.4.2 Recovery Frequency

Bailing of the wells with product and maintenance of the absorbent socks will conducted during the first and second post remedial sampling events and quarterly thereafter.

7.4.3 LNAPL Disposal and Reporting

All LNAPL and water/product mixture will be contained in DOT approved 55 gallon drums and stored on-site for proper disposal. The amount of product recovered and manifests for transportation to an approved disposal facility will be documented within the SMP and subsequent Periodic Review Reports (PRR).

8.0 REMEDY EFFECTIVENESS

Prior to the conduct of the remedial action, pre-application groundwater samples will be collected from all viable monitoring wells during the July 2017 quarterly sampling event (or results from the last quarterly will be used for comparison purposes if remedy implemented prior to July). The samples will be analyzed for VOC's via EPA method 8260C with the purpose of establishing a baseline for concentrations, in order to gauge the level of effectiveness of the remedial application. Select wells (MW-3, MW-11 and MW-12) that exhibited fuel oil odors will also be analyzed by EPA method 8270BN for Semi-Volatile Organic Compounds (SVOCs). Monitoring wells BW-2 and BW-4 will also be sampled in order to confirm contamination did not migrate to off-site locations. Post-application sampling will also be conducted on the wells mentioned above approximately one (1) month - six (6) weeks post application and a second sampling event conducted before the end of the 2017 year. Post sampling analysis will include testing for SVOCs via EPA 8270BN for all wells sampled. The following degradation parameters will also be tested during the first and second post application sampling events: dissolved oxygen (DO), oxygen reduction potential (ORP), pH, temperature and TEA parameters (iron, nitrate and sulfate).

8.1 Pre/Post Application Sampling Results

Effectiveness sampling results will be tabulated and drafted into a quarterly sampling report issued to the Department. Examples of monitoring/sampling data sheets and tables to be completed during pre/post application are attached as Tables-1 and 2.

8.2 Contaminant Migration Prevention

The implementation of the proposed remedy and the on-going operation of the SVE/SSDS will prevent contaminant migration through the following processes:

- groundwater, soil and soil vapor migration has been stabilized via the SVE/SSDS operation treating both groundwater, soil and soil vapor contamination by direct source removal of said media.

- implementing the proposed remedy will account for the reduction of both contaminated soil and groundwater media through degradation of chemicals of concern, therefore reducing overall contaminant mass in soil and groundwater, reducing the risk of contaminant migration off-site.

8.3 Monitoring Degradation Parameters

Monitoring for anaerobic degradation conditions will include sampling and testing for DO and ORP levels throughout key locations within the site. If the results of the proposed remedy fail to meet RAOs and/or do not indicate a downward trend in contamination levels (two (2) post sampling rounds) provisions will be made to supplement additional applications during the site management phase including: the addition of the proposed carbon catalyst. As discussed in section 8.0 above, monitoring degradation parameters: DO, ORP , pH, temperature and TEA parameters (iron, nitrate and sulfate) will be tested during the post remedy sampling events and also on a monthly basis thereafter. In the event the effectiveness sampling results do not show a downward trend in contamination levels or background degradation parameters are not indicative of an anaerobic environment, provisions will be made to add a carbon source in order supplement the remedy.

9.0 PROJECT SCHEDULE and REPORTING

Upon the NYSDEC's approval of the RAP work JVS contracting personnel will prepare to mobilize to the site within four (4) to six (6) weeks of the approval date. This will allow time for materials to be ordered and shipped directly to our staging facility. The NYSDEC will be given at least seven (7) days notice prior to the initial start date. The remedial work is anticipated to take between 3-5 working days.

A comprehensive construction completion report (CCR) detailing the events and results that took place during the conduct of the RAP will be issued to the Department after the final sampling event. The comprehensive report will include but not limited to the following items and included within the Final Engineering Report (FER) for the site:

- precise dose quantities of bac-t and nutrients installed

- DTW readings recorded during the treatment event

- laboratory data results from monitoring wells associated with the RAP

- graphs, tables, spreadsheets and charts depicting lab data

- a comparative discussion which outlines pre and post application conditions

- a discussion on the overall effectiveness of the RAP

10.0 SITE MANAGEMENT PLAN (SMP)

The SMP addresses the means for implementing the Institutional controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement (EE) for the Site, in order to manage the remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36.

Remedial action contingencies set forth in the SMP for the site will include provisions for additional injections as well as an extensive monitoring program geared towards monitoring for anaerobic conditions. If the results of the effectiveness monitoring reveal parameters not conducive for anaerobic degradation and/or the remedy is ineffective, evaluation of alternatives must occur.

11.0 HEALTH AND SAFETY

All Micro-Bac® products are natural, non pathogenic, and are not genetically engineered. They were developed by Micro® Bac's research and development laboratories and are manufactured under strict quality guidelines with batch and lot control. No special clothing or equipment is necessary to handle the product. Micro-Bac® products meet United States Environmental Protection Agency (USEPA) requirements for release into the environment.

In order to ensure the safety of our workers and staff involved with the treatment procedure JVS adheres to the Occupational Safety and Health Administration (OSHA) guidelines. During the application procedure JVS field technicians and staff will be equipped with Level D personal protective equipment (PPE). Level D OSHA guidelines require the following PPE:

- Eye protection- wear goggles or face shield (splash prevention)
- Head- hard hat when required
- Respiratory- Use dust respirator approved by NIOSH/MSA
- Hands- Wear neoprene gloves
- Feet- Wear steel-toe boots with chemical resistant soles or neoprene covers
- Clothing- Long sleeve shirts and long pant legs. Consider using Tyvek body suit or coveralls

The Material Safety Data Sheet (MSD) for the M1000H product is included as Attachment-E.

12.0 COMMUNITY AIR MONITORING PLAN (CAMP)

A CAMP has been developed and is included as Attachment-F. The CAMP discusses established monitoring requirements that are employed during all ground intrusive activities in order to protect off-site receptors including: residences and businesses, and on-site workers not directly involved with the subject work activities.

As part of the PSWP involves work located within 20' of potentially exposed individuals or structures, special requirements will be followed in order to monitor and prevent this exposure. These special requirements are discussed below:

Special Requirements for Work Within 20 feet of Potentially Exposed Individuals or Structures

Since work areas will be within 20 feet of potentially exposed populations in adjacent occupied rooms within the building, the continuous monitoring locations for VOCs and particulates will reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby adjacent occupied rooms. The use of engineering controls such as vapor/dust barriers, temporary negative pressure enclosures, or special ventilation devices will be considered to prevent exposures related to the work activities and to control dust and odors. Consideration will be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or off-work hours in non-residential settings. The following requirements will be adhered to during the indoor portion of the planned work:

-If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring will occur within the occupied structure(s). Background readings in the occupied spaces will be taken prior to the commencement of the planned work and any unusual background readings will be discussed with the NYSDOH prior to the commencement of the work.

-If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceeds 75 mcg/m3, work activities will be suspended until controls are implemented and are

successful in reducing the total particulate concentration to 75 mcg/m3 or less at the monitoring point.

During indoor work activities all individuals not directly involved with the planned work will be absent from the former dry-cleaning equipment room and additional remediation areas where the work is to take place. Dust/Vapor barriers will be installed at all openings/archways/doorways within the work area that connect adjoining/occupied rooms. Monitoring points will be established on the opposite sides of the Dust/Vapor barriers to ensure compliance with the above mentioned concentration thresholds for VOCs and particulates. If necessary, engineering controls will be readily available if concentration values for VOCs and particulates are in exceedance of the applicable thresholds mentioned above. Readily available engineering controls will include a vent fan, which would be exhausted to the outside air in order to remove VOCs and particulates from the indoor work area. The outside exhaust point would then be monitored to comply with the regulations set forth in the CAMP included as Attachment-F.

13.0 CONCLUSION

The selected remedy has been proven on a pilot scale to reduce both chlorinated VOC contamination and petroleum related SVOC soil and groundwater contamination. In comparison to the additional alternatives discussed in this plan, enhanced bio is the most suitable remedy with regard to effectively reducing the potential for future human health exposures and reducing toxicity levels in soil and groundwater to applicable standards. It is also the most cost effective approach to site remediation and most feasible option with regard to implementability.

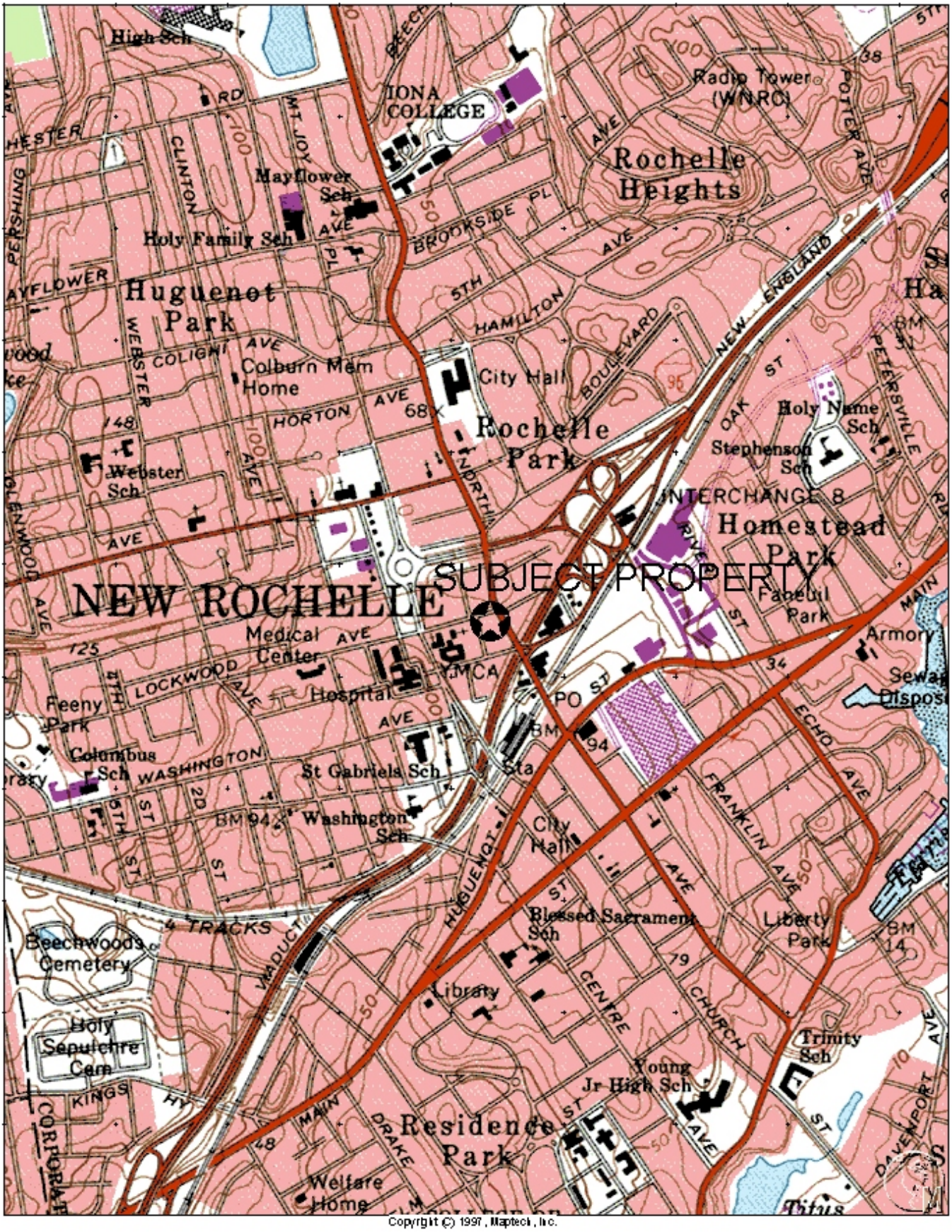
The fundamental elements of the PS are being proposed as a full scale remedy based on it's prior success in reducing groundwater contamination by up to 60%. Recent quarterly laboratory results have indicated a minor re-bound effect in select monitoring wells, but with full scale implementation and the fact that this is the second installation, re-bounding is expected to be minimal.

The overall goal of the remedy is to meet the RAO's established for the site and document a continued downward trend in soil and groundwater contamination. Based upon prior investigations conducted at the site, the currently operating SVE/SSDS has been solely responsible for removing vapors from volatilizing groundwater contamination with lab results showing a downward trend over the coarse of multiple quarterly sampling events. The continued operation of the current vapor

extraction system along with the implementation of the proposed remedy will help to continue the downward trend in soil/groundwater contamination at the site as well as strive to meet the RAO's.

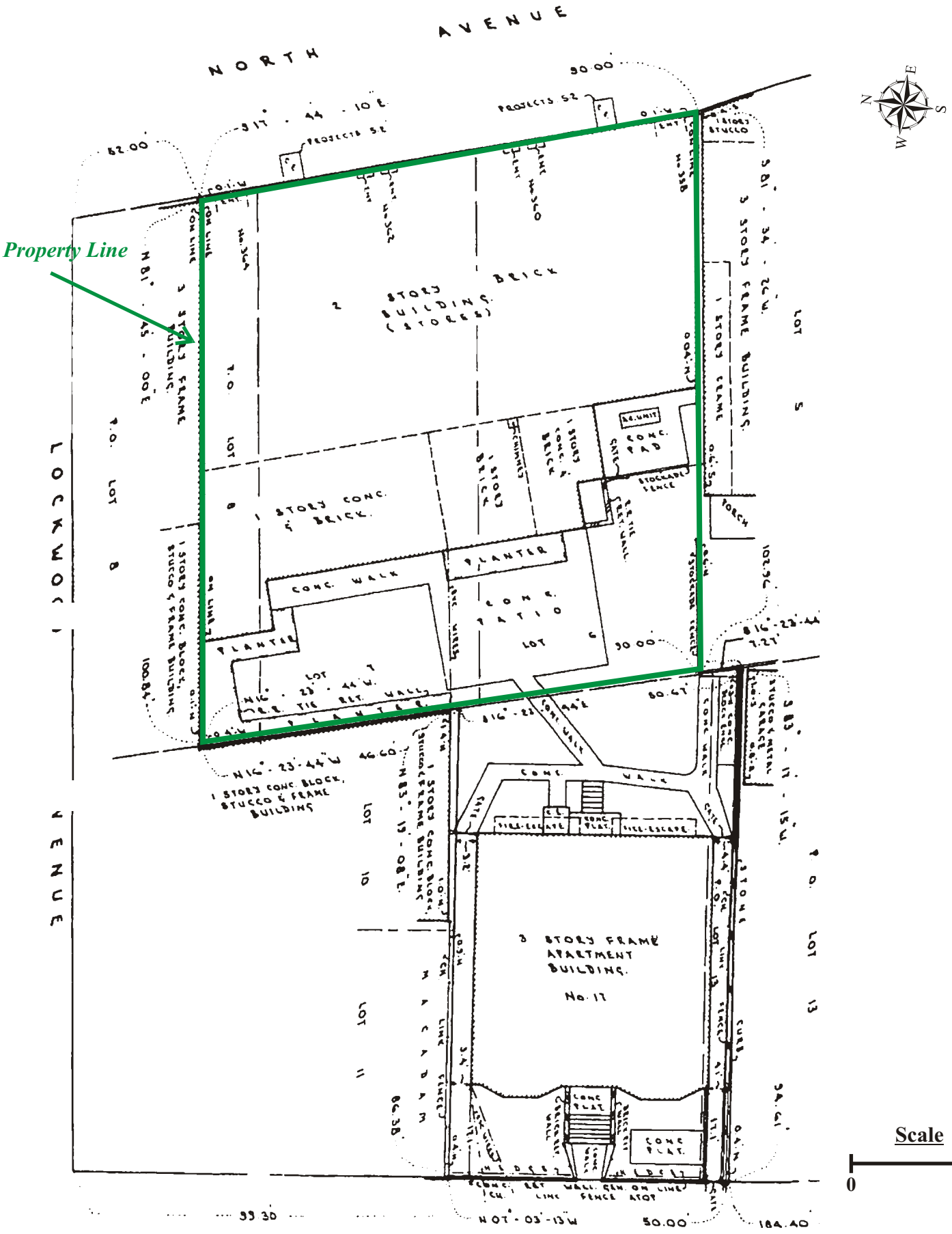
A track-4 clean-up approach has been selected based on the fact that contamination (soil and groundwater) will remain above the RAO's for the site, which will require as per the EE, ECs and ICs established in order protect potential human health and environmental exposures. Management of all established ECs and ICs for the site are discussed within the SMP. The track-4 pathway also requires that the exposed soils within the backyard of the property will meet the land-use (restricted-commercial) restriction SCOs for the top two feet (24") of exposed soil for all constituents under the Part-375-6.8 table.

FIGURES



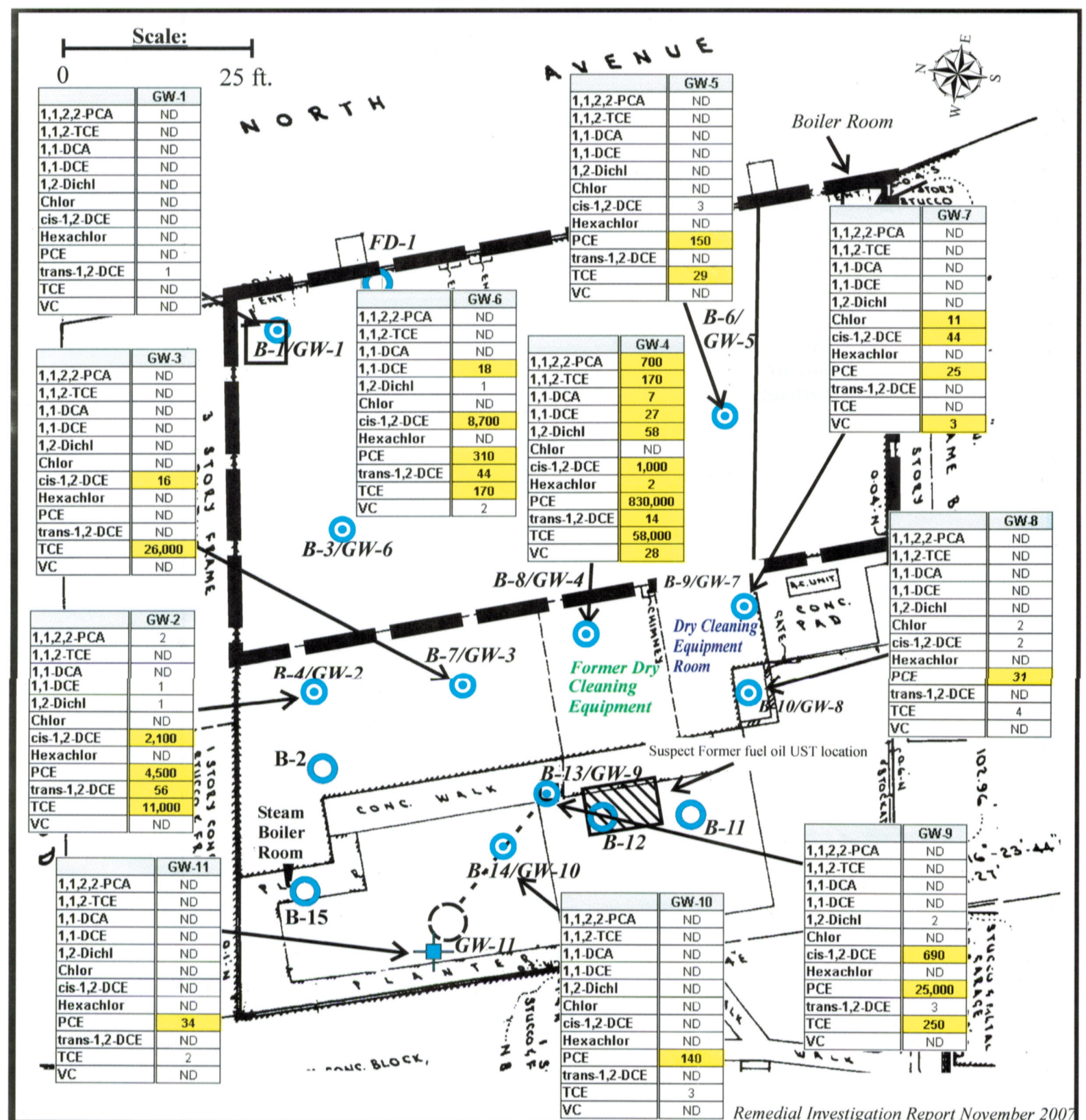
Remedial Investigation Report November 2007

Figure 1- Site Location	**Schmuklers Cleaners** **358 - 364 North Avenue** **New Rochelle, NY** **Site #C360088** **Index# A3-0542-0306**	John V. Soderberg P.E PO BOX 263 Stony Brook, NY



Remedial Investigation Report November 2007

Figure 2 - Site Survey	**Schmuklers Cleaners** **358 - 364 North Avenue** **New Rochelle, NY** **Site #C360088** **Index# A3-0542-0306**	John V. Soderberg P.E PO BOX 263 Stony Brook, NY



	GW-1
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	ND
cis-1,2-DCE	ND
Hexachlor	ND
PCE	ND
trans-1,2-DCE	1
TCE	ND
VC	ND

	GW-2
1,1,2,2-PCA	2
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	1
1,2-Dichl	1
Chlor	ND
cis-1,2-DCE	2,100
Hexachlor	ND
PCE	4,500
trans-1,2-DCE	56
TCE	11,000
VC	ND

	GW-3
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	ND
cis-1,2-DCE	16
Hexachlor	ND
PCE	ND
trans-1,2-DCE	ND
TCE	26,000
VC	ND

	GW-4
1,1,2,2-PCA	700
1,1,2-TCE	170
1,1-DCA	7
1,1-DCE	27
1,2-Dichl	58
Chlor	ND
cis-1,2-DCE	1,000
Hexachlor	2
PCE	830,000
trans-1,2-DCE	14
TCE	58,000
VC	28

	GW-5
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	ND
cis-1,2-DCE	3
Hexachlor	ND
PCE	150
trans-1,2-DCE	ND
TCE	29
VC	ND

	GW-6
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	18
1,2-Dichl	1
Chlor	ND
cis-1,2-DCE	8,700
Hexachlor	ND
PCE	310
trans-1,2-DCE	44
TCE	170
VC	2

	GW-7
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	11
cis-1,2-DCE	44
Hexachlor	ND
PCE	25
trans-1,2-DCE	ND
TCE	ND
VC	3

	GW-8
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	2
cis-1,2-DCE	2
Hexachlor	ND
PCE	31
trans-1,2-DCE	ND
TCE	4
VC	ND

	GW-9
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	2
Chlor	ND
cis-1,2-DCE	690
Hexachlor	ND
PCE	25,000
trans-1,2-DCE	3
TCE	250
VC	ND

	GW-10
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	ND
cis-1,2-DCE	ND
Hexachlor	ND
PCE	140
trans-1,2-DCE	ND
TCE	3
VC	ND

	GW-11
1,1,2,2-PCA	ND
1,1,2-TCE	ND
1,1-DCA	ND
1,1-DCE	ND
1,2-Dichl	ND
Chlor	ND
cis-1,2-DCE	ND
Hexachlor	ND
PCE	34
trans-1,2-DCE	ND
TCE	2
VC	ND

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1,1,2,2-PCA- 1,1,2,2-Tetrachloroethane; **1,1,2-TCE**- 1,1,2-Trichloroethene; **1,1 - DCA** - 1,1-Dichloroethane; **1,1-DCE**- 1,1-Dichloroethene; **1,2-Dichl**- 1,2-Dichlorobenzene; **Chlor** - Chloroethene; **cis-1,2-DCE** - cis-1,2-Dichloroethene; **Hexachlor**- Hexachlorobutadine; **PCE**- Tetrachloroethene; **TCE** - Trichloroethene; **VC** - Vinyl chloride

Bolded and highlighted concentrations are indicative of VOC detected at concentration exceeding applicable NYSDEC Class GA Groundwater Standards and/or Guidance Values

- Basement Portion of the Building - Soil Only Sampling Location - Soil and groundwater sampling locations - Groundwater Only Sample Location

Figure 3 - Halogenated VOCs detected in Groundwater Samples in micrograms per liter (ug/L)

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

John V. Soderberg P.E
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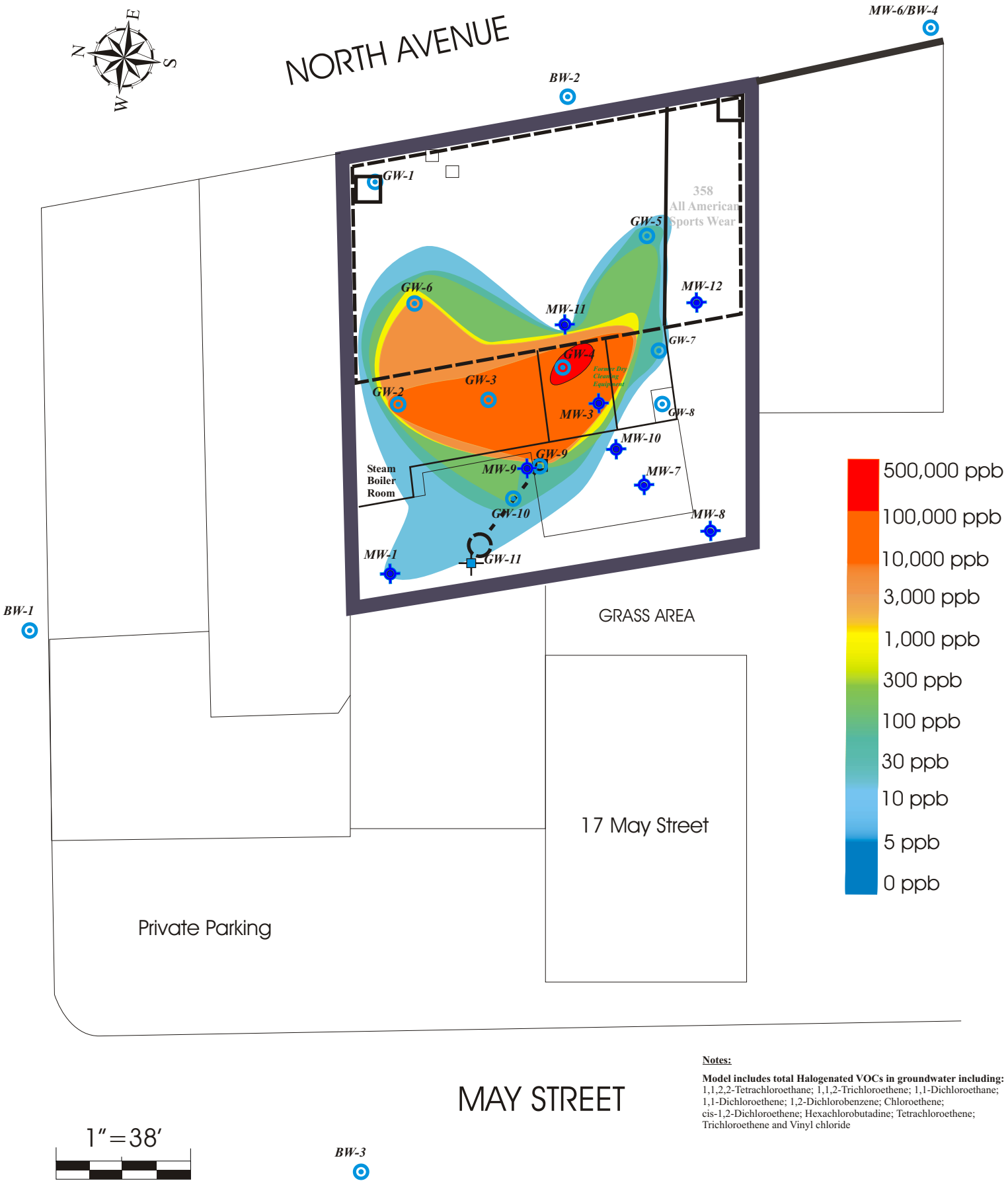
Stony Brook, NY



Notes:

Model includes total Halogenated VOCs in groundwater including: 1,1,2,2-Tetrachloroethane; 1,1,2-Trichloroethene; 1,1-Dichloroethane; 1,1-Dichloroethene; 1,2-Dichlorobenzene; Chloroethene; cis-1,2-Dichloroethene; Hexachlorobutadine; Tetrachloroethene; Trichloroethene and Vinyl chloride

Total Halogenated VOCs in Groundwater
FIGURE-3a

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

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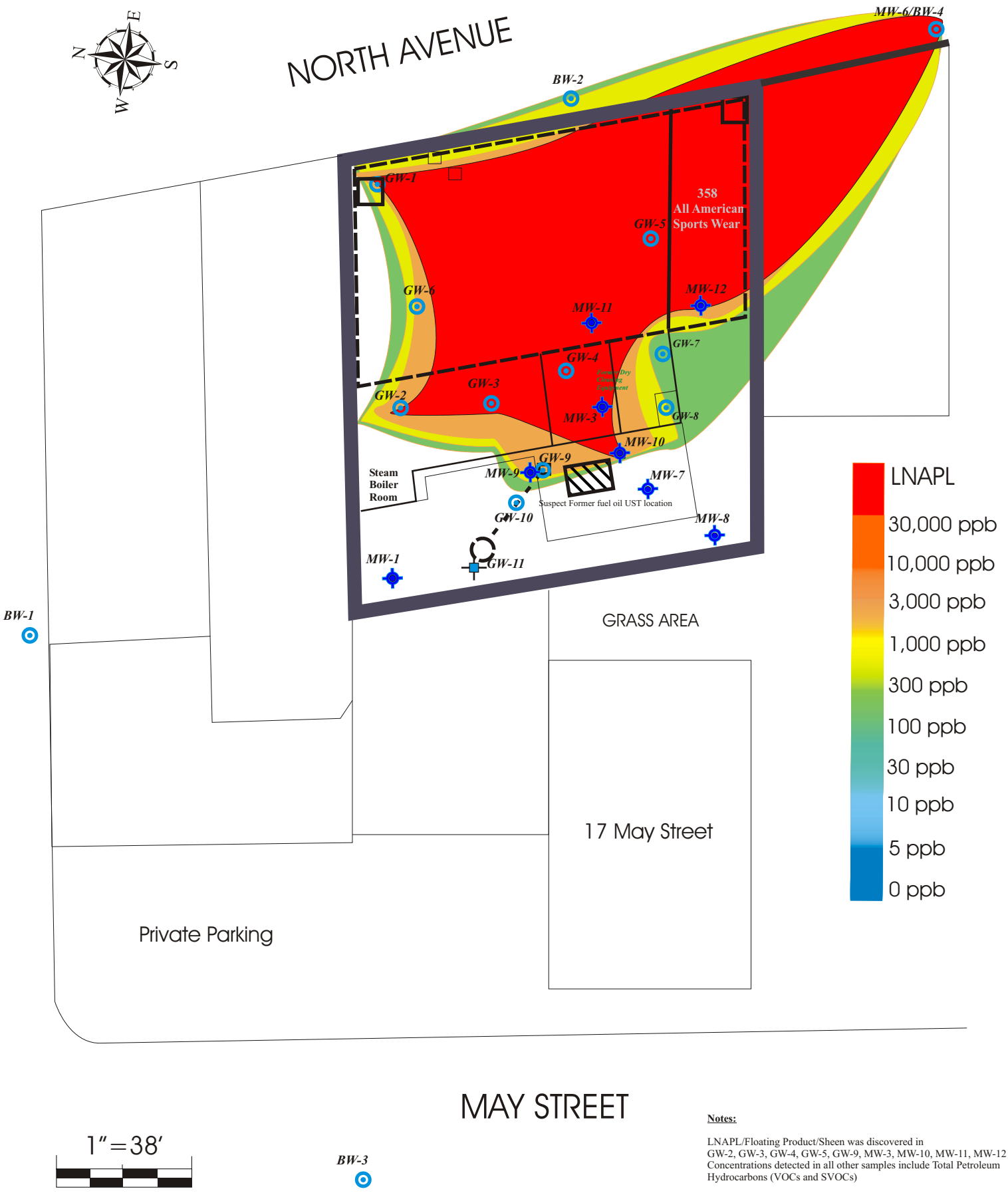
Stony Brook, NY



Notes:

LNAPL/Floating Product/Sheen was discovered in GW-2, GW-3, GW-4, GW-5, GW-9, MW-3, MW-10, MW-11, MW-12 Concentrations detected in all other samples include Total Petroleum Hydrocarbons (VOCs and SVOCs)

Total Petroleum Related (VOCs and SVOCs) in Groundwater FIGURE-3b

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

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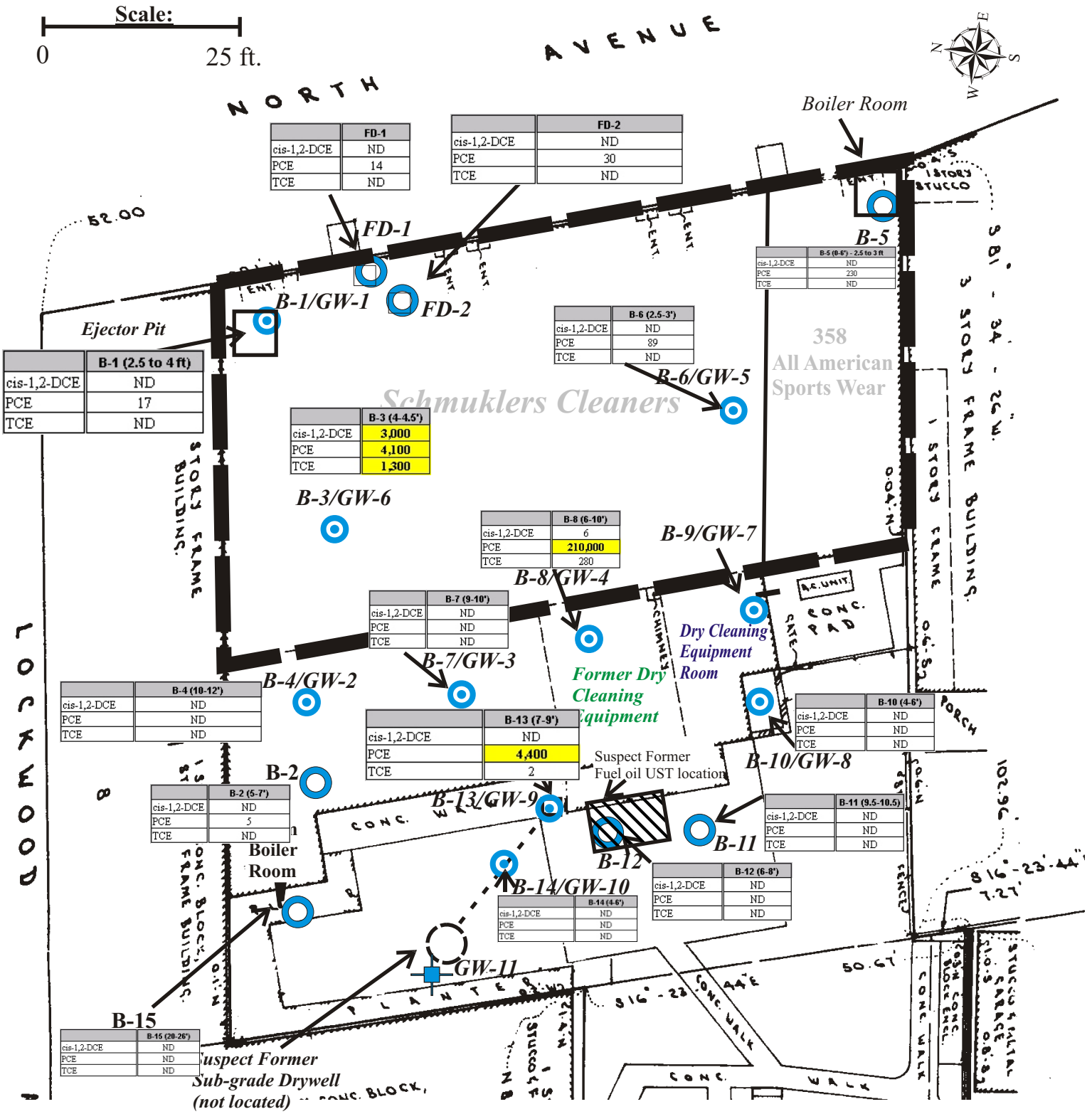

Remedial Investigation Report November 2007

Cis 1,2-DCE - cis 1,2-Dichloroethene; **PCE -** Tertrachloroethene; **TCE -** Trichloroethene

Bolded and highlighted concentration areindicative of VOC detected at concentration exceeding applicable SCOs

- Basement Portion of the Building *- Soil Only Sampling Location* *- Soil and groundwater sampling locations* *- Groundwater Only Sample Location*

Figure 3c- Halogenated VOCs detected in Soil Samples in micrograms per kilogram (ug/kg)

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

John V. Soderberg P.E
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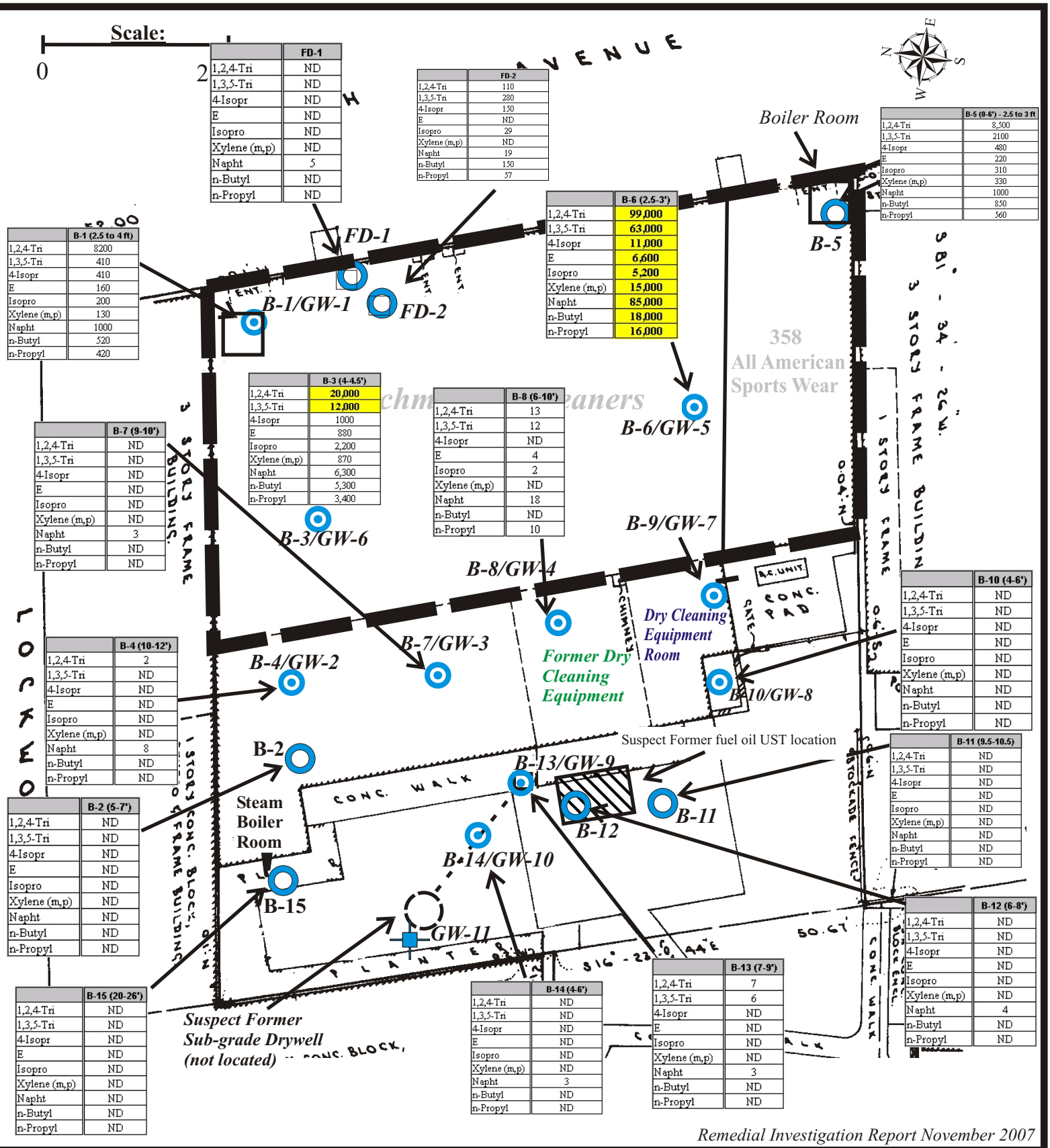

	FD-1
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	5
n-Butyl	ND
n-Propyl	ND

	FD-2
1,2,4-Tri	110
1,3,5-Tri	280
4-Isopr	150
E	ND
Isopro	29
Xylene (m,p)	ND
Napht	19
n-Butyl	150
n-Propyl	57

	B-1 (2.5 to 4 ft)
1,2,4-Tri	8200
1,3,5-Tri	410
4-Isopr	410
E	160
Isopro	200
Xylene (m,p)	130
Napht	1000
n-Butyl	520
n-Propyl	420

	B-2 (5-7')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	ND
n-Butyl	ND
n-Propyl	ND

	B-3 (4-4.5')
1,2,4-Tri	20,000
1,3,5-Tri	12,000
4-Isopr	1000
E	880
Isopro	2,200
Xylene (m,p)	870
Napht	6,300
n-Butyl	5,300
n-Propyl	3,400

	B-4 (10-12')
1,2,4-Tri	2
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	8
n-Butyl	ND
n-Propyl	ND

	B-5 (0-6') - 2.5 to 3 ft
1,2,4-Tri	8,500
1,3,5-Tri	2100
4-Isopr	480
E	220
Isopro	310
Xylene (m,p)	330
Napht	1000
n-Butyl	850
n-Propyl	560

	B-6 (2.5-3')
1,2,4-Tri	**99,000**
1,3,5-Tri	**63,000**
4-Isopr	**11,000**
E	**6,600**
Isopro	**5,200**
Xylene (m,p)	**15,000**
Napht	**85,000**
n-Butyl	**18,000**
n-Propyl	**16,000**

	B-7 (9-10')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	3
n-Butyl	ND
n-Propyl	ND

	B-8 (6-10')
1,2,4-Tri	13
1,3,5-Tri	12
4-Isopr	ND
E	4
Isopro	2
Xylene (m,p)	ND
Napht	18
n-Butyl	ND
n-Propyl	10

	B-10 (4-6')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	ND
n-Butyl	ND
n-Propyl	ND

	B-11 (9.5-10.5)
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	ND
n-Butyl	ND
n-Propyl	ND

	B-12 (6-8')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	4
n-Butyl	ND
n-Propyl	ND

	B-13 (7-9')
1,2,4-Tri	7
1,3,5-Tri	6
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	3
n-Butyl	ND
n-Propyl	ND

	B-14 (4-6')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	3
n-Butyl	ND
n-Propyl	ND

	B-15 (20-26')
1,2,4-Tri	ND
1,3,5-Tri	ND
4-Isopr	ND
E	ND
Isopro	ND
Xylene (m,p)	ND
Napht	ND
n-Butyl	ND
n-Propyl	ND

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1,2,4-Tri - 1,2,4-Trimethylbenzene; **1,3,5-Tri** - 1,3,5-Trimethylebenzene; **4-Isopro** - 4-Isopropyltoluene; **E-** Ethylbenzene; **Isopro** - Isopropylbenzene; Xylene (m,p); **Napht-** Naphthalene; **n-Butyl** - N-Butylbenzene; **n-Propyl**- n-Propylbenzene

Bolded and highlighted concentration are indicative of contaminant detected at concentration exceeding applicable SCOs

- Basement Portion of the Building *- Soil Only Sampling Location* *- Soil and groundwater sampling locations* *- Groundwater Only Sample Location*

Figure 3d - Petroleum-Related SVOCs detected in Soil Samples in micrograms per kilogram (ug/kg)

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

John V. Soderberg P.E
PO BOX 263
Stony Brook, NY

Application/Monitoring Well Locations

FIGURE-4

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

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Stony Brook, NY

Drawn By: JHG

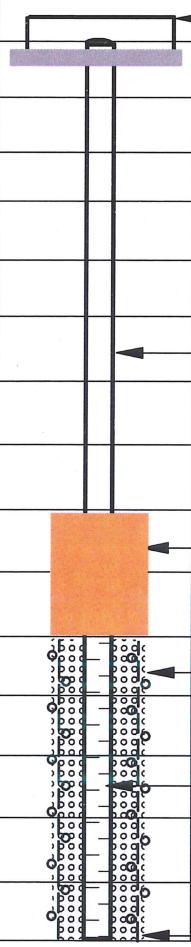
Specs for MW-9 and 10

Project: Schmuklers Dry Cleaners
Client: HNJ Realty LLC. 358-364 North Ave. New Rochelle, NY
Location: Rear of building
Well No: MW-9 and 10 **Use:** Monitoring
Install Method: Geoprobe direct push
Casing Type: PVC **Casing Dia:** 1" **Casing Length:** 10'
Screen Type: PVC **Screen Dia:** 1" **Screen Length:** 5'
Screen Slot: 0.02" **Gravel Pack:** #2 Fil-pro
Casing Seal: Cement **Finish:** Cement flush

Date: July 2015
Be Job No:
Operator: Butch
Bore Hole Dia: 2.25"
Sample Method: n/a
Depth to Water: 12'
Total Depth: 15'
Security: 5" Manhole

Figure - 5

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0 Feet			5" Manhole Cover (flush grade, cemented in place)
			Hydraulic Cement Seal
5'			10' of (1") PVC Riser Pipe
10'			2' Bentonite Seal to Casing
			Fil-Pro Gravel Pack Material
			5' - 1"PVC 0.02" Slot Screen
15'			DTB = 15'



John V. Soderberg P.E
PO BOX 263
Stony Brook, NY

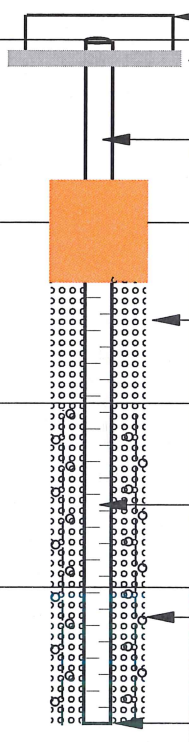
Drawn By: JHG

Specs for MW-11 and 12

Project: Schmuklers Dry Cleaners
Client: HNJ Realty LLC. 358-364 North Ave. New Rochelle, NY
Location: Rear of building
Well No: MW-11 and 12 **Use:** Monitoring
Install Method: Manual Hand Auger
Casing Type: PVC **Casing Dia:** 2" **Casing Length:** 2'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 3.5'
Screen Slot: 0.02" **Gravel Pack:** #2 Fil-pro
Casing Seal: Cement **Finish:** Cement flush

Date: June 2015
Be Job No: 6800
Operator: Butch
Bore Hole Dia: 2.25"
Sample Method: 8260/8270
Depth to Water: 4'
Total Depth: 5.5'
Security: 5" Manhole

Figure -6

* Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0 Feet			5" Manhole Cover (flush grade, cemented in place)
1.5'			Hydraulic Cement Seal 2' of (2") PVC Riser Pipe
3'			1' Bentonite Seal to Casing
4.5'			3.5' - 2"PVC 0.02" Slot Screen
6'			Fil-Pro Gravel Pack Material DTB = 5.5'

notes: *wells are located in basement floor approx 8' bgs

John V. Soderberg P.E
PO BOX 263
Stony Brook, NY

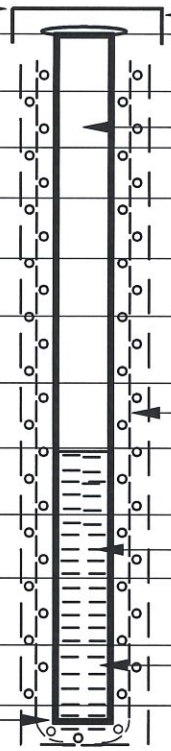
Figure-7

Drawn By: JGH

Well Log

Project: Schmuklers Dry Cleaners
Client: HNJ Realty LLC.
Location: 358-364 North Ave. New Rochelle, NY
Well No: MW-3 **Use:** Monitoring
Drilling Method: Geoprobe direct push
Casing Type: PVC **Casing Dia:** 2" **Casing Length:** 8'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 5'
Screen Slot: 20 mil **Gravel Pack:** #2 Fil-pro
Casing Seal: Cement **Finish:** Cement flush

Date: 11/11/08
Be Job No:
Driller: Jon Jeffrey
Bore Hole Dia: 3.5"
Sample Method: N/A
Depth to Water: 12.33'
Total Depth: 13'
Security: 5" Manhole

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0 Feet			5" Manhole cemented in place (2" thick)
			2"x 8' Schedule 40 Solid Riser
			Fil-Pro Gravel Pack Material
			2"x 5' PVC 20 mil. Slot Screen
			Water Table 12'
13'	Bottom		

● - Surface soil (0-24") sample locations

1"=37'

Site Cover
Exposed Sampling Area
Locations
Figure-8

Drawn: JGH

Schmuklers Cleaners
358 - 364 North Avenue
New Rochelle, NY
Site #C360088
Index# A3-0542-0306

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P.O Box 263
Stony Brook, NY

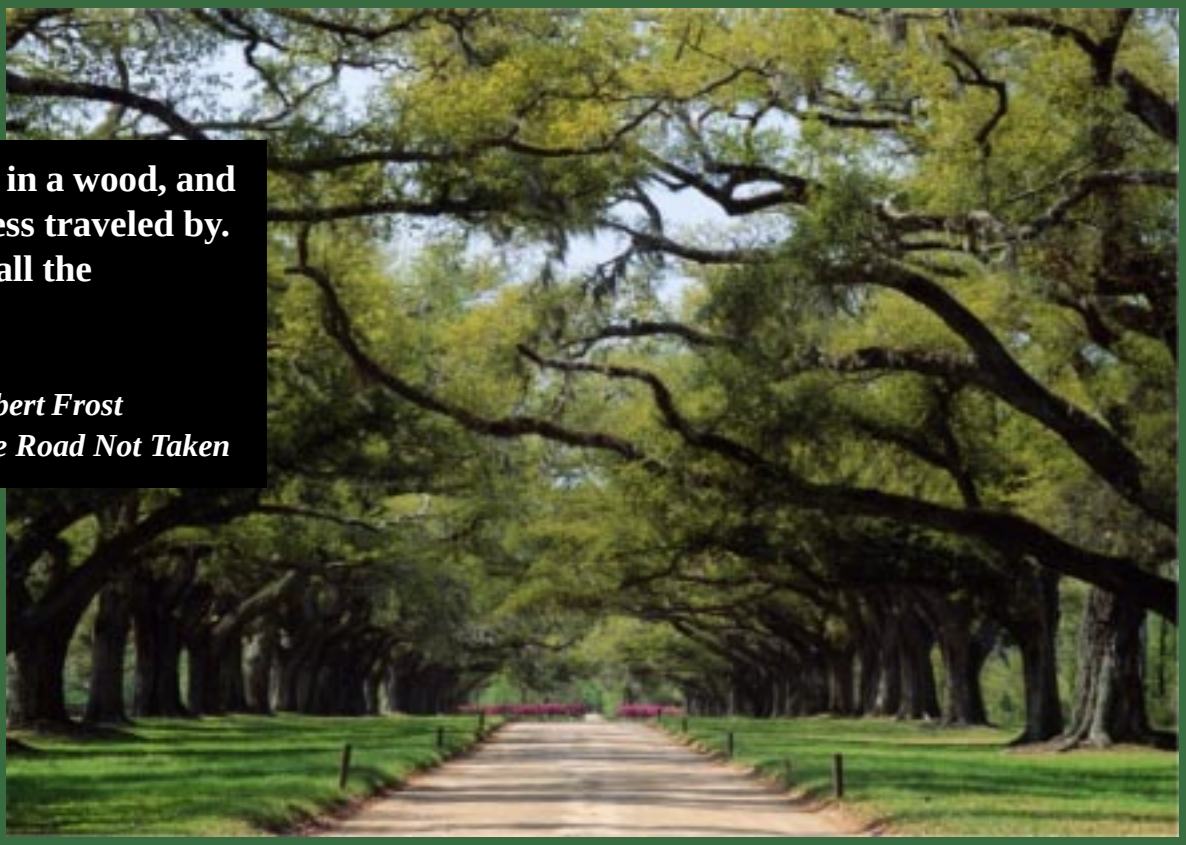
ATTACHMENTS

Attachment-A

Micro Bac International Brochure

Leading The New Direction

Micro-Bac International Inc.®



"Two roads diverged in a wood, and I -- I took the one less traveled by. And that has made all the difference."

Robert Frost
The Road Not Taken

When Micro-Bac International Inc.® set out in 1979 to improve the environment and enhance the accessibility to the world's energy reserves, they had little more than a conscience and a vision. Today, Micro-Bac continues to create global solutions for our resource-strapped planet. From the critical issues with water and wastewater, to the detrimental effects of environmental contamination, to the challenges of efficient petroleum production, Micro-Bac is committed to solving these problems with innovative and environmentally friendly solutions. And that first step has made all the difference.

A Commitment to Innovation

Developing solutions for a marketplace that is fast approaching $1 trillion requires not only constant innovation, but a dedication to a new way of thinking. Toward this goal, Micro-Bac R & D teams are firmly committed to new ideas such as Green Integrated Technologies. By recognizing the value of integrating other key technologies, Micro-Bac ensures that new product development creates compatible and synergistic solutions for us all.

Unlocking the Secrets of the Universe

The key to solving the world's environmental and energy problems is apparent to those researchers who truly understand the dynamics of environmental biotechnology. Micro-Bac has spent decades compiling and maintaining one of the most extensive environmental culture collections in the world. Micro-Bac scientists continue to discover new biological solutions from the myriad that can be expressed under the diverse conditions that exist in the environment.

"The secrets to environmental solutions are ours for the taking."

Biotechnologies

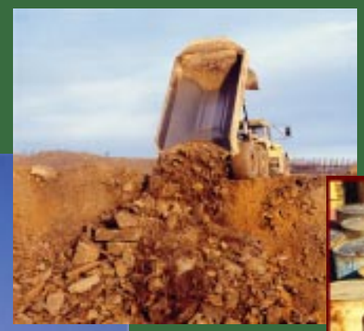
Micro-Bac technologies are successfully being used in the following markets:*

- Oil Production
- Reservoir Stimulation
- Refinery and Terminal Services
- Paraffin and Scale Control
- Fracture Damage Repair
- Tank Cleaning
- Bioremediation
- Municipal Wastewater Treatment
- Industrial Wastewater Treatment
- Grease Trap Maintenance
- Food Processing Waste
- Waste Odor Control
- Animal Waste Degradation
- Animal Health

* Box color represents product line color

SOLUTIONS WITH A CONSCIENCE

Soil & Groundwater Clean-up



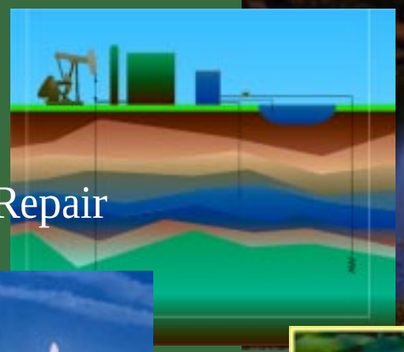
Oil Production

Bioremediation

Paraffin & Scale Control

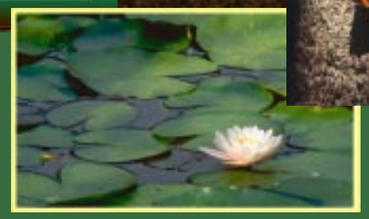
Tank Cleaning

Terminal Services



Wastewater Remedies

Frac Damage Repair



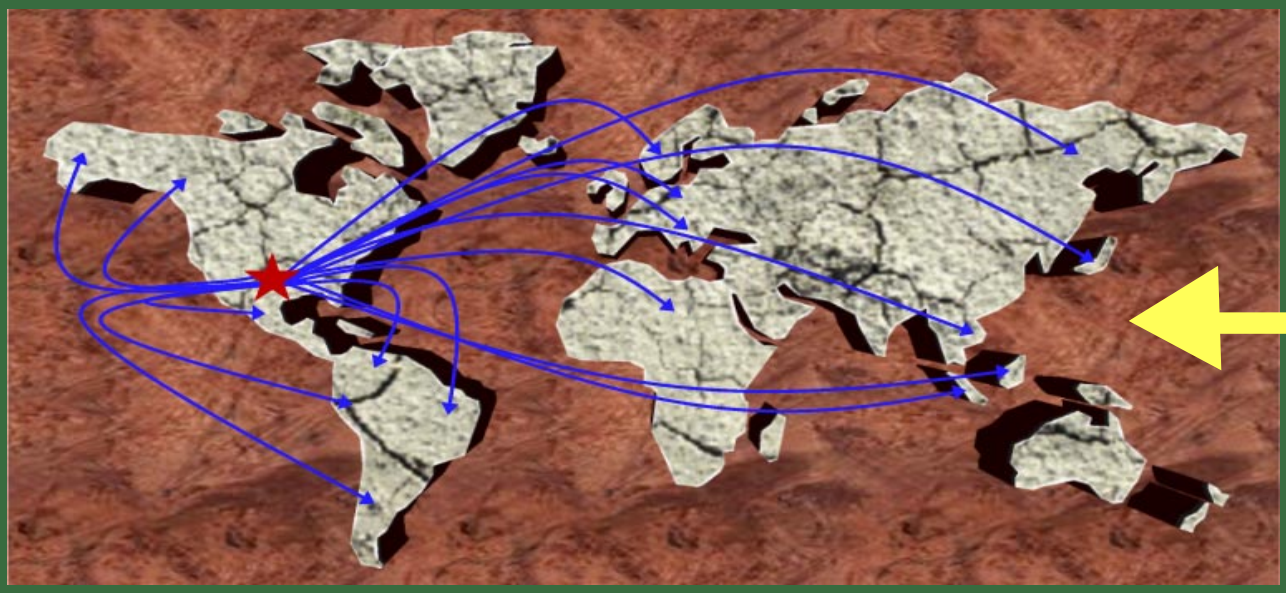
Grease Digestion and Trap Maintenance

Animal Waste Solutions

NASA Commercial Technology Spinoff

Degradation of Food Processing Wastes

A Global Marketplace



Strategically located business interests throughout the world.

Micro-Bac has developed an impressive list of partnerships around the world that share our vision. It is the mission of the business development group to seek out those individuals which exemplify the entrepreneurial spirit and those businesses that realize the value in sharing strategies, time and resources.

Information

As advances in Information Technology rapidly unfold, Micro-Bac will continue to develop its seamless business and distribution channels. Using both internet and intranet capabilities, our goal is to link partners, distributors, industries and customers with the latest information, the best products and the most innovative platform from which to build business.

A Formula for Success

Today more than ever, businesses need to build strong relationships to stay competitive.

From distributors to joint ventures to strategic alliances, Micro-Bac continues to refine its business models for success. All Micro-Bac distributors are trained both technically and in business development to ensure long term success and greater market growth.

A Full Service Company

Analytical Testing and Services

Project Management

Business Development

Oil Field Engineering Services

Product Application Support

Marketing Support

Leading the New Direction

The new direction requires us to address the Earth's diminishing resources with a dynamic consortium of science, business and vision. Micro-Bac is at the forefront of this revolution by combining biological innovation and information technology to develop safe, alternative solutions for cleaning up the environment.

The new direction has just begun and Micro-Bac is leading the way.

Micro-Bac International Inc.
3200 N. I H 35 • Round Rock, TX 78681
Ph: 512-310-9000 • Fax: 512-310-8800
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Attachment-B

Lab Case Study

M-1000H★
Biodegradation Lab Study

SUBSTANCE: PCE Contaminated water

TESTING: Groundwater samples were obtained to perform a four week biodegradation study. The study was conducted such that each sampling point had a sterilized sample, a control sample, and test samples with bacteria only, with nutrients only, and with bacteria and nutrients.

The samples were incubated at 35°C in containers sealed to minimize any volatilization. Samples were analyzed by U.S. EPA method 8260 for volatile organics.

RESULTS: The following compounds were found in the samples: 2-butanone, acetone, benzene, ethylbenzene, m,p xylenes, methylene chloride, 0-xylenes, t1,2 dichloroethene, tetrachloroethene (PCE), toluene, and trichloroethene. No vinyl chloride was detected in any sample prior to treatment.

The principal contaminants found were 2-butanone (methyl ethyl ketone) at 12,000 micrograms per liter and tetrachlorethene (PCE) at 49,000 micrograms per liter. All other contaminants were in the in the 200 micrograms per liter or less range. Volatilization appeared to be minimal as levels of 2-butanone and methylene chloride in the control were maintained throughout the incubation period.

Good evidence for biodegradation of the various pollutants was found. The M-1000H★ treated samples consistently produced levels lower than the uninoculated controls. The level of biodegradation ranged from >99% for 2-butanone to >97% for tetrachloroethene by week four. (see table below)

		2-butanone	tetrachloroethene
	Starting concentrations	12,000	49,000
Day 7	Control	10,000	17,000
	Bacteria	<100	4,000
Day 14	Control	14,000	270
	Bacteria	<100	11
Day 21	Control	9,200	27
	Bacteria	<100	<5
Day 28	Control	12,000	210
	Bacteria	<100	<5

Methylene chloride exhibited the least amount of biodegradation (19% decline), and by week four was the only pollutant out of eleven still detected in the samples. Vinyl chloride was not detected in any of the samples following treatment.

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Attachment-C

M-1000H Product Information

MICRO-BAC INTERNATIONAL, INC.
3200 N. IH-35
ROUND ROCK, TX 78681-2410
(512) 310-9000 fax (512)310-8800

MATERIAL SAFETY DATA SHEET

Section 1. Identification	Tri-Phasic Nutrient #12
Section 2. Identity Information / Composition	
Hazardous Components	Phosphates, Potassium, Nitrogen Compounds
Common Name	Same
Section 3. Physical Characteristics	
Specific Gravity	1.35-1.50
Boiling Point	>100°C
Melting Point	N/A
Solubility in Water	Water Soluble
Appearance and Odor	Rich chocolate brown liquid when suspended. Product settled in three phases after prolonged storage, faint chemical odor
Section 4. Fire and Explosion Hazard	
Flash Point	N/A
Flammable Limits	N/A
Extinguishing Media	N/A
Special Fire Fighting Procedures	N/A
Unusual Fire and Explosion Hazards	None
Section 5. Reactivity Data	
Stability	Stable
Incompatibility	Reducing Agents
Conditions to Avoid	Extreme Conditions
Hazardous Decomposition or Byproducts	Nitrogen Oxides
Section 6. Health Hazard Data	
Routes of Entry	Skin, Ingestion
Carcinogenicity (NTP or IARC)	N/A
Signs and Symptoms of Exposure	If ingested, may cause gastric and/or intestinal upset, may cause irritation to skin or eyes
Emergency and First Aid Procedures	**Eye or Skin Contact**: Flush with clean water for 10 minutes **Ingestion:** Do not induce vomiting; Drink plenty of water
Section 7. Precautions for Safe Handling	
Material Release or Spillage	Clean with soap and water
Waste Disposal Method	Flush with clean water
Handling and Storage Precautions	Avoid contact with skin and eyes
Ventilation Required	None
Respiratory Protection	None
Personal Protection	Rubber, plastic, or cloth gloves
Work/Hygienic Practices	Routine

MICRO-BAC INTERNATIONAL, INC.
3200 N. IH-35
ROUND ROCK, TX 78681-2410
(512) 310-9000 FAX (512)310-8800

MATERIAL SAFETY DATA SHEET

Section 1. Identification — **M-1000H★**

Section 2. Identity Information / Composition

Hazardous Components	None (TSCA 40 CFR 710.4 b)
Common Name	Microbial Product: Naturally occurring microorganisms

Section 3. Physical Characteristics

Specific Gravity	1.02
Boiling Point	100°C
Melting Point	0°C
Solubility in Water	Water Soluble
Appearance and Odor	Light Pink to Tan Liquid with Moderate Odor

Section 4. Fire and Explosion Hazard

Flash Point	NA
Flammable Limits	NA
Extinguishing Media	NA
Special Fire Fighting Procedures	None
Unusual Fire and Explosion Hazards	None

Section 5. Reactivity Data

Stability	Stable
Incompatibility	None
Conditions to Avoid	Extreme Conditions
Hazardous Decomposition or Byproducts	None

Section 6. Health Hazard Data

Routes of Entry	Ingestion; Eye Contact
Carcinogenicity (NTP or IARC)	None
Signs and Symptoms of Exposure	May Cause Gastric and/or Intestinal Upset
Emergency and First Aid Procedures	Ingestion: Do Not Induce Vomiting; Drink plenty of water Eye Contact: Flush with clean water for 10 minutes

Section 7. Precautions for Safe Handling

Material Release or Spillage	Clean up with soap and water or with disinfectant
Waste Disposal Method	Flush with clean water
Handling and Storage Precautions	Store in tightly closed original container at temperatures between 13°C to 32°C
Ventilation Required	None Required
Respiratory Protection	None Required
Personal Protection	None required; use of gloves and safety glasses suggested
Work/Hygienic Practices	Routine

1-17-94

Attachment-D

Tri-Phasic-12(Nutrients)

TECHNICAL DATA
TRI-PHASIC 12™

BIOLOGICAL STIMULANT

General Description

TRI-PHASIC 12™ is a proprietary blend of vitamins, minerals and organic nutrients used to stimulate microbial activity in product applications for Micro-Bac® International biological products where indigenous nutrients are insufficient to support optimal microbial activity. Such applications include bioremediation of contaminated soil and water. TRI-PHASIC 12™ may also be used in the remediation of oligotrophic waters and tank bottoms. By lowering the carbon/nitrogen ratio, biodegradation is enhanced and mineralization is promoted. TRI-PHASIC 12™ is supplied in an easy-to-use colloidal liquid form that flows and is freely soluble in water. It is designed to be used in conjunction with Micro-Bac® International products such as M-1000H*™.

Product Formula

TRI-PHASIC 12™ contains all the major and minor mineral compounds as well as defined vitamins required by the specific microorganisms used in the Micro-Bac® International products. It supports maximal activity of these microorganisms under both aerobic and anaerobic conditions.

Product Specifications

Color	dark brown layers
pH concentrated	circa 4.3
pH diluted	5-8
Shipping Size	1 gal. container
Odor	mild
Wt. per Gal.	11.4 lbs.
Specific Gravity	1.30
Solubility	> 2 gal. per 100 gal water

Dosage

Micro-Bac's® technical staff can provide dosage recommendations based on the design and volumes of the project site. For example one container of Tri-Phasic 12™ nutrient is generally used with 50 cubic yards of contaminated soil.

Application

TRI-PHASIC 12™ is generally dissolved in water at a rate of 1 container per 55 gallons. It is generally applied after and occasionally simultaneous with microbial treatments.

Handling & Safety

TRI-PHASIC 12™ is a natural product that meets EPA requirements for release into the environment. Special clothing and equipment are not required for handling TRI-PHASIC 12™ although contact by inhalation or touch should be avoided and the use of gloves and a dust respirator is suggested. Routine hygiene should be observed.

Shipping

TRI-PHASIC 12™ is shipped in a one gallon container, F.O.B. Round Rock, Texas

Service

When the use of TRI-PHASIC 12™ is indicated through testing, Micro-Bac® provides technical support and treatment design to its customers.

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(512)310-9000 • Toll-Free (877)559-1800 • Fax (512)310-8800 • E-mail: mail@micro-bac.com • Website: http://www.micro-bac.com

Attachment-E

M-1000H MS/MSD

TECHNICAL DATA

M-1000H*™

FOR THE DEGRADATION OF CONTAMINATED SUBSTANCES

General Description

M-1000H*™ is a biological product designed and formulated for the broad spectrum degradation of a variety of compounds found in contaminated and/or hazardous wastes. These compounds include simple aromatics such as benzene, toluene, ethyl benzene, and xylenes, as well as more complex aromatics like naphthalene, chlorinated compounds, and benzo-a-pyrene. Alkane mixtures, including transport fluids (gasoline and diesel), are also degraded. A variety of chlorinated aliphatic and aromatic compounds such as trichlorethene and chlorinated benzenes and biphenyls (PCBs) are also degraded. This product has been used successfully in a variety of *in-situ* and *ex-situ* applications.

M-1000H*™ consists of live, specially selected, biologicals and biochemicals, along with a supply of balanced nutrients in a ready-to-use liquid medium.

These microorganisms thrive in a variety of site conditions with diverse soils and various water chemistries. They are capable of using many of the listed hazardous waste chemicals as a carbon source.

Specifications

Color	light pink to tan
pH	6.5-8
Weight per gallon	8.51 lbs.
Specific gravity	1.02
Freeze point	32°F
Viscosity	1.30 cps - 60°F
Odor	mild organic

Application

M-1000H*™ can be applied to contaminated or hazardous substances in numerous ways. For soil applications, the product can be sprayed, or the soil can be reduced to a slurry and circulated with added product. For vadose zone or groundwater applications, the product can be applied into wells or infiltration galleries. Often the addition of specially-formulated nutrients can be used to augment the activity of the product in conditions where macro nutrients such as carbon, nitrogen, or phosphate are limited. A good monitoring program is critical to the success of any bioremediation project.

Handling and Safety

M-1000H*™ is a natural, non-pathogenic, non-engineered biological product that meets EPA requirements for release into the environment. Special clothing or equipment are not required for handling M-1000H*™. Routine hygiene should be observed.

Shipping

M-1000H*™ is shipped in two sizes: in 5-gallon containers (45 lbs), and in 55-gallon containers (495 lbs), F.O.B. Round Rock, Texas.

Service

When the use of M-1000H*™ is indicated, Micro-Bac International provides technical support services to its customers.

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Attachment-F
CAMP

BROWNFIELD C L E A N U P P R O G R A M

COMMUNITY AIR MONITORING PLAN

FOR

HNJ REALTY LLC.

FOR
FORMER SCHMUKLERS CLEANERS
358 - 364 North Avenue, New Rochelle, New York
Site No.: C360088
Index No.: A3-0542-0306

PREPARED BY

John V. Soderberg
P.O BOX 263
Stony Brook, NY

April 2015

TABLE OF CONTENTS

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for work activities to be performed under the Pilot Study Work Plan at the Former Schmuklers Cleaners site located at 358-364 North Avenue in New Rochelle, New York. The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from investigative activities at the site.

Compliance with this CAMP is required during all ground intrusive activities that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include, but are not limited to; boring, remedial, soil and groundwater sampling activities. This CAMP has been prepared to ensure that the work activities do not adversely affect passers by, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of work-related contaminants to off-site areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air;

- New York State Department of Environmental Conservation Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

Chlorinated and Petroleum related volatile organic compounds (VOCs) are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during the investigation activities is through real-time VOC and air particulate (dust) monitoring. Since work areas will be within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. In order to rule out any potential exposures to nearby receptors, the immediate work area will be isolated and monitoring points will be established outside of the work area where the potential for exposure exists.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. In this case, the work area is within 20 feet of potentially exposed populations and occupied structures, so perimeter monitoring points will be located to represent the nearest potentially exposed individuals within the building.

Fugitive respirable dust will be monitored using a MiniRae Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable Mini Rae photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan.

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment

appropriate to measure the types of contaminants known or suspected to be present.

The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remediation activities, then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- collection of purge water in covered containers ;
- storage of excess samples and soils in drums or covering with plastic;

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during boring activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter ($\mu g/m^3$). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 $\mu g/m^3$ above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 $\mu g/m^3$ greater than background (upwind perimeter) for the 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 μg/m3 at any time during boring activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Placement of soils in drums or covering stockpiles with plastic;
- Misting of the boring area with a fine water spray from a hand-held spray bottle

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 μg/m3 greater than the upwind levels.

There may also be situations where the dust is generated by boring activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 μg/m3, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based upon the established criteria and his/her professional judgment. The SSO shall review the data with the PM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.

APPENDICES

APPENDIX A

Specification Sheet for Rotron EN656 and EN 6 replacement

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EN 656 & CP 656
Sealed Regenerative Blower w/Explosion-Proof Motor

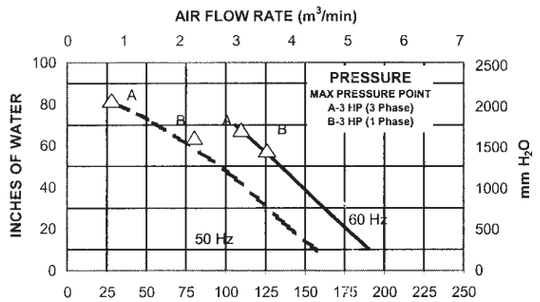
FEATURES
- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 212 SCFM
- Maximum pressure: 70 IWG
- Maximum vacuum: 70 IWG
- Standard motor: 3.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

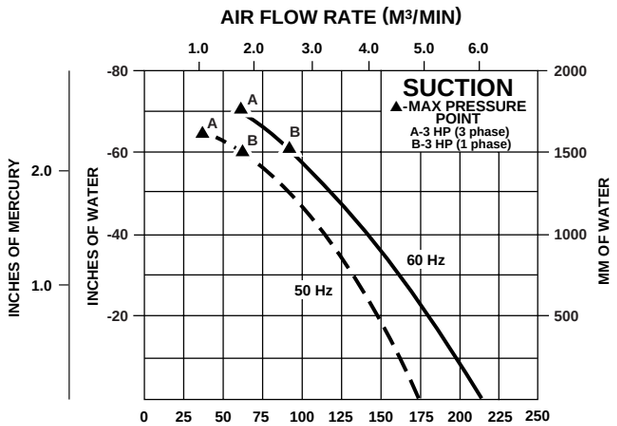
MOTOR OPTIONS
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

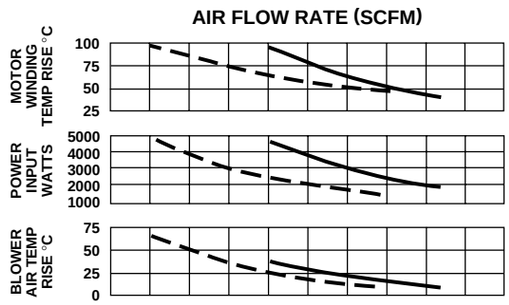
BLOWER OPTIONS
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

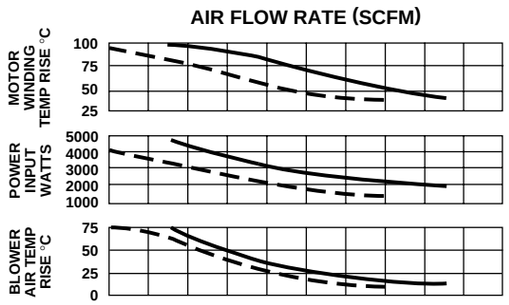
ACCESSORIES (See Catalog Accessory Section)
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges & relief valves
- Switches – air flow, pressure, vacuum or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
-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

BLOWER PERFORMANCE AT STANDARD CONDITIONS









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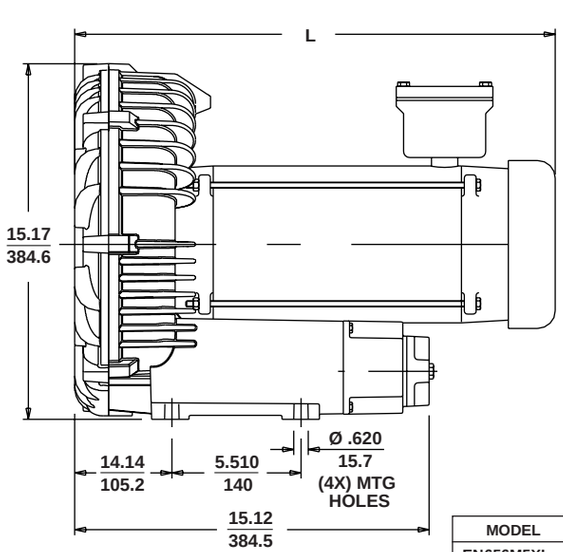
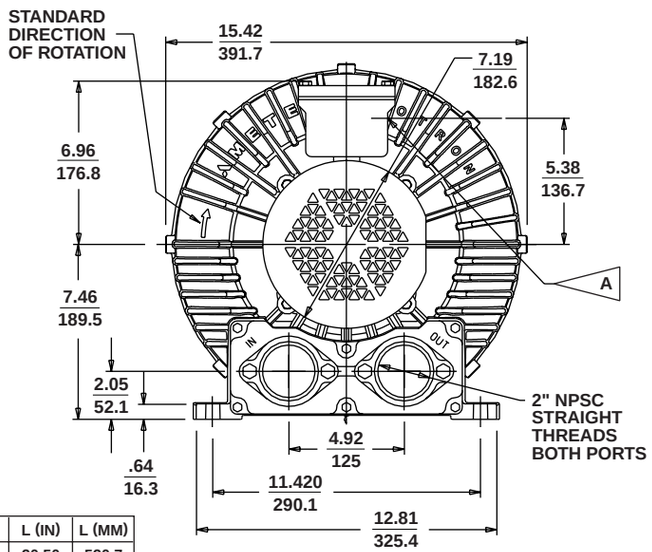
EN 656 & CP 656
Sealed Regenerative Blower w/Explosion-Proof Motor

Scale CAD drawing available upon request.





DIMENSIONS: IN / MM
TOLERANCES: .XX ± .08/2
(UNLESS OTHERWISE NOTED)

MODEL	L (IN)	L (MM)
EN656M5XL	20.50	520.7
EN656M86XL	17.89	454.4
EN656M72XL	17.89	454.4
CP656M72XLR	17.89	454.4
CP656FU72XLR	17.89	454.4

A TERMINAL BOX CONNECTOR HOLE 3/4" NPT FEMALE THREAD

SPECIFICATIONS

MODEL	EN656M5XL	EN656M72XL		EN656M86XL	CP656FU72XLR
Part No.	080060	080059		080058	080142
Motor Enclosure – Shaft Material	Explosion-proof–**CS**	Explosion-proof–**CS**		Explosion-proof–**CS**	Chem XP – **SS**
Horsepower	3	3		3	Same as EN656M72XL 080059 except add Chemical Processing (CP) features from catalog inside front cover
Phase – Frequency [1]	Single - 60 Hz	Three - 60 Hz		Three - 60 Hz	
Voltage [1]	208-230	208-230	460	575	
Motor Nameplate Amps [3]	15.5-14.5	7.4	3.7	3.0	
Max. Blower Amps [3]	16.3-16.8	8.2	4.1	4.1	
Inrush Amps	95-86	54	27	21.6	
Starter Size	1	0	0	0	
Service Factor	1.0	1.0		1.0	
Thermal Protection [2]	Class B - Pilot Duty	Class B - Pilot Duty		Class B - Pilot Duty	
XP Motor Class – Group	I-D, II-F&G	I-D, II-F&G		I-D, II-F&G	
Shipping Weight	135 lb (64 kg)	110 lb (50 kg)		110 lb (50 kg)	

[1] Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

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

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

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

Rev. 2/04

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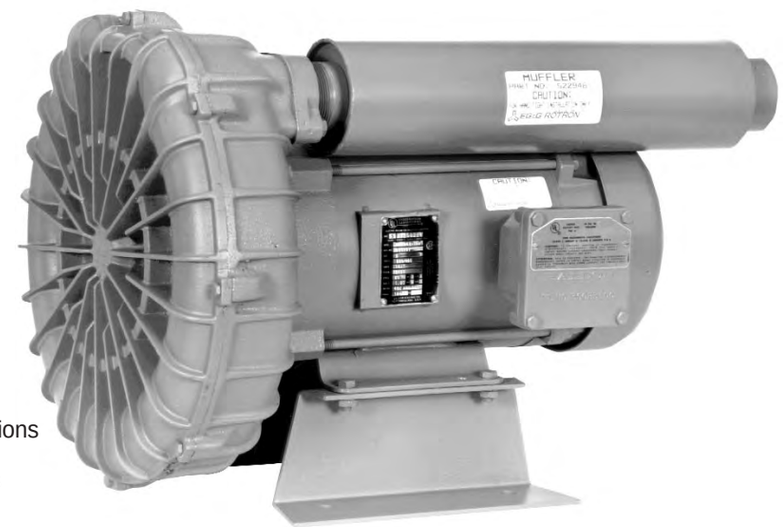
EN 6 & CP 6
Sealed Regenerative Blower w/Explosion-Proof Motor

FEATURES
- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 225 SCFM
- Maximum pressure: 104 IWG
- Maximum vacuum: 85 IWG
- Standard motor: 5.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

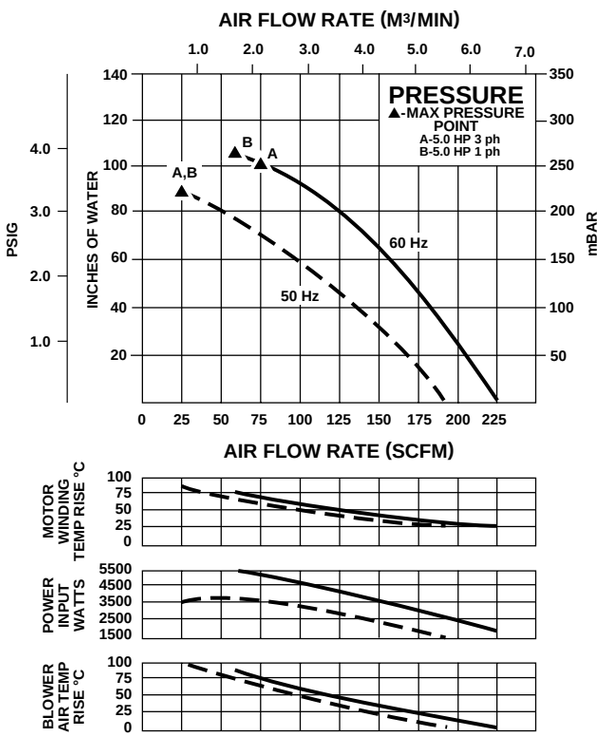


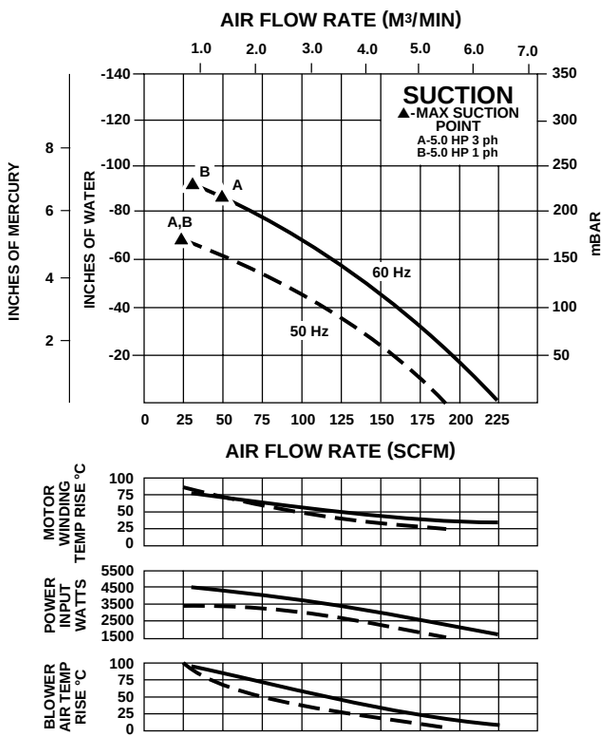
MOTOR OPTIONS
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

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

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

BLOWER PERFORMANCE AT STANDARD CONDITIONS





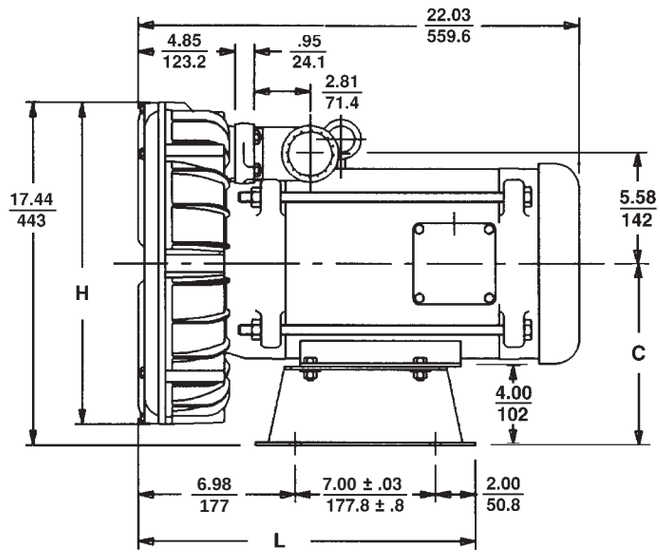
Rev. 2/04

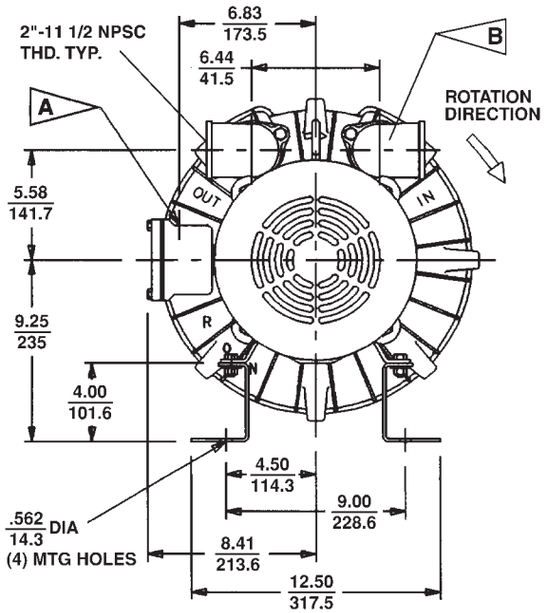
AMETEK Technical and Industrial Products, Kent, OH 44240 • e mail: rotronindustrial@ametek.com • internet: www.ametektmd.com

SectionC 2004.qxd 6/26/04 10:53 AM Page C-16

EN 6 & CP 6
Sealed Regenerative Blower w/Explosion-Proof Motor

Scale CAD drawing available upon request.





DIMENSIONS: IN / MM
TOLERANCES: .XX ± .12/3
(UNLESS OTHERWISE NOTED)

MODEL	L (IN/MM)	C (IN/MM)	H (IN/MM)
EN/CP6F72L	20.37/517	8.5/216	16.7/424
EN/CP6F5L	22.0/560	10.21/259	17.5/443

A — 0.75" NPT CONDUIT CONNECTION AT 12 O'CLOCK POSITION

B — 90° ELBOW SUPPLIED ON 1 PHASE MODEL ONLY

SPECIFICATIONS

ALL PRODUCTS LISTED INCLUDE MUFFLER PN 522948

MODEL	EN6F5L	EN6F72L		EN6F86L	CP6FW5LR	CP6FW72LR
Part No.	038361	038180		038438	–	038978
Motor Enclosure – Shaft Material	Explosion-proof – **CS**	Explosion-proof – **CS**		Explosion-proof – **CS**	Chem XP – **SS**	Chem XP – **SS**
Horsepower	5.0	5.0		5.0	Same as EN6F5L – 038361 except add Chemical Processing (CP) features from catalog inside front cover	Same as EN6F72L – 038180 except add Chemical Processing (CP) features from catalog inside front cover
Phase – Frequency [1]	Single - 60 Hz	Three - 60 Hz		Three - 60 Hz		
Voltage [1]	230	230	460	575		
Motor Nameplate Amps	19.5	14	7	5.7		
Max. Blower Amps [3]	23	15.8	7.9	6.3		
Inrush Amps	175	152	76	38		
Starter Size	2	1	0	0		
Service Factor	1.0	1.0		1.0		
Thermal Protection [2]	Class B - Pilot Duty	Class B - Pilot Duty		Class B - Pilot Duty		
XP Motor Class – Group	I-D, II-F&G	I-D, II-F&G		I-D, II-F&G		
Shipping Weight	232 lb (105 kg)	160 lb (73 kg)		160 lb (73 kg)		

[1] Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

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

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

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

Rev. 2/04

APPENDIX B

Photo Log SVE/SSDS Installation

Installation of manifold for all SVE wells and SSDS

Trenching for SSDS in Basement of Schmukler's Cleaners

Basement piping manifold for each for North and South basement trenching

SVE/SSDS exhaust piping to 10' above roof line

System control room and carbon filtration units

SVE blower and system intake

Hand installation of permanent vapor point

Installed permanent vapor point with gravel pack

Hydrating bentonite to assure proper seal

Finished permanent vapor point sealed to grade surface

APPENDIX C

WCDOH Air Permit

Westchester gov.com

Robert P. Astorino
County Executive

Department of Health

Cheryl Archbald, MD, MPH
Acting Commissioner

December 8, 2010

HNJ Realty LLC
c/o Berninger Environmental, Inc.
90-B Knickerbocker Avenue
Bohemia, NY 11716
Attn: Walter Berninger

RE: Renewal Certificate to Operate
Schmukler's Cleaners
New Rochelle, NY

Dear Mr. Berninger:

Receipt of your fees for the above-referenced facility is hereby acknowledged. Please be advised that our records reveal that your facility is being operated in compliance with applicable County Laws and Regulations.

Enclosed please find your renewal Certificate to Operate, which is valid until December 31, 2013.

Very truly yours,

Paul Kutzy, P.E.
Assistant Commissioner
Bureau of Environmental Quality

PK:kf
Enclosure

cc: File

Bureau of Environmental Quality
145 Huguenot Street, 7th Floor
New Rochelle, NY 10801 Telephone: 914-813-5000 Fax: 914-813-5158

Westchester gov.com

Robert P. Astorino
County Executive

Department of Health
Cheryl Archbald, MD, MPH, FAAP
Acting Commissioner of Health

Westchester County Department of Health

Bureau of Environmental Quality

CERTIFICATE TO OPERATE SOURCES OF AIR CONTAMINATION

Facility Information:

Emission Point Number: 001

Facility Name: Schmuklers Cleaners

Facility Telephone:

Street Address: 358-364 North Avenue New Rochelle, NY 10801

Municipality:

Facility Owner Information:

Owner's Name: HNJ Realty LLC c/o Berninger Environmental, Inc.

Owner Telephone:(631) 589-6521

Mailing Address: 90-B Knickerbocker Avenue Bohemia, NY 11716

Description Process:

Sub slab depressurization system consisting of one (1) horizontal soil vapor extraction system and three (3) recovery wells, one (1) 3 hp, 200 acfm Rotron EN656 regenerative blower and two (2) 200 pound Siemen Vent-Scrub 200 vapor phase granular activated carbon (GAC) vessel in series. Emissions from the outlet of the GAC vessels are vented directly into atmosphere via a 2-inch diameter stack. Monitoring report, as required by NYSDEC, including air monitoring perchloroethylene and VOC concentrations at the inlet and outlet of each air pollution control system shall be submitted to the Department.

The Certificate supersedes any earlier Certificate to Operate issued for this source by the Department pursuant to Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County.

That the operation of this source is in accordance with the source description, approved plans, and emission limits for this source on file with the Department.

The source of air contamination shall be operated in compliance with the provisions of Chapter 873, Article XIII of the Laws of Westchester County and 6NYCRRR.

This certificate shall be suspended or revoked as provided by the laws of Westchester County, if this source of air contamination is maintained or operated other than in compliance with the above.

Air contaminants collected by air cleaning devices shall be handled and disposed of in an approved manner.

FOR THE COMMISSIONER

BY: _____
Cheryl Archbald, MD, MPH, FAAP Acting Commissioner of Health

BY: _____
Paul Kutzy, P.E., Assistant Commissioner
Bureau of Environmental Quality

Certificate Issued: *01/01/2011*

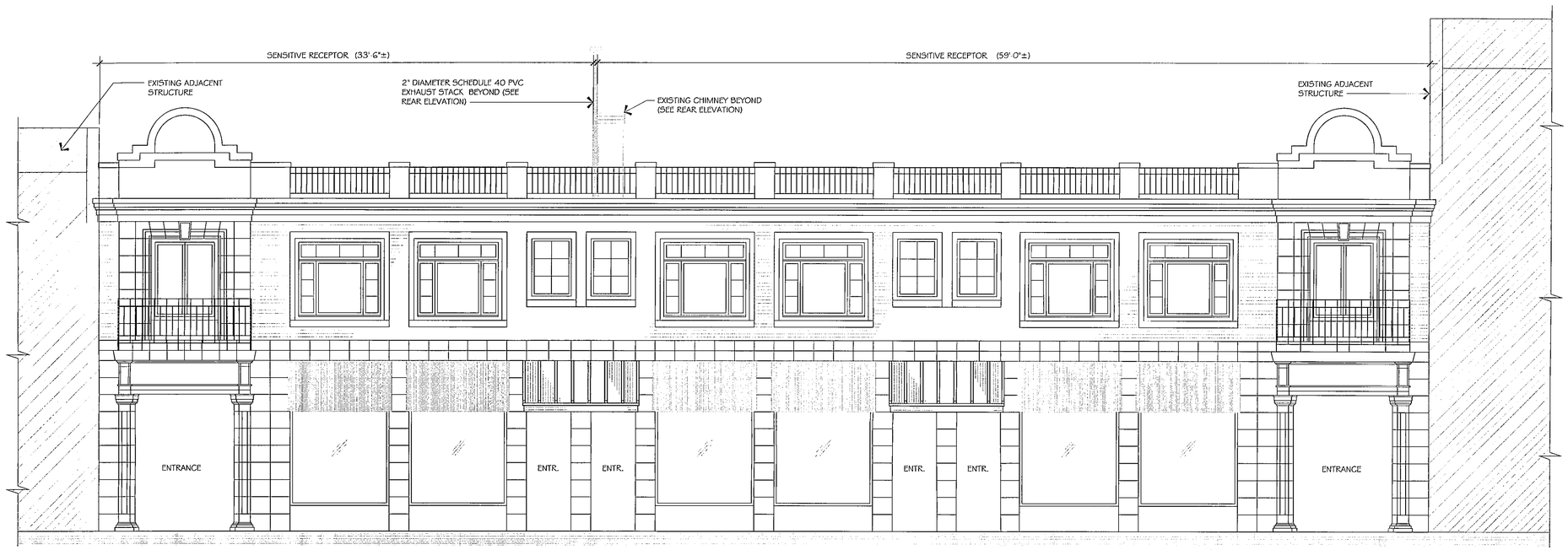
Certificate Expires: *12/31/2013*

145 Huguenot Street • 8th Floor New Rochelle, N.Y. 10801

THIS PERMIT MUST BE POSTED CONSPICUOUSLY

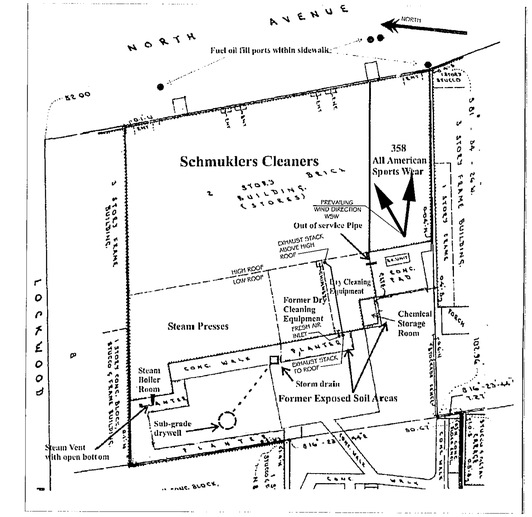
APPENDIX-D

P.E As-Built Drawings



FRONT ELEVATION - FACING NORTH AVENUE (LOOKING WEST)

SCALE: 1/4" = 1'-0"



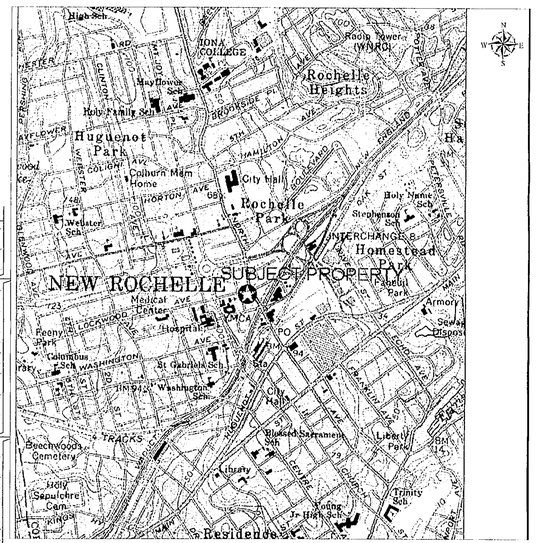
SCHEMATIC FLOOR PLAN AND SITE FEATURES

NO SCALE

INFORMATION SHOWN ON THIS PLAN IS TAKEN FROM 'BERNINGER ENVIRONMENTAL INC.' AIR PERMIT APPLICATION FIGURE 2b.

REAR ELEVATION - LOOKING EAST

SCALE: 1/4" = 1'-0"



LOCATION PLAN

NO SCALE

DRAWING ALTERATION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, PROFESSIONAL ENGINEER, OR LAND SURVEYOR TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY.

ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS.

Issued for Approval

Berninger Environmental Inc.
90 Knickerbocker Avenue
Bohemia, New York 11716

Michael W. Mckeown, P.E.
6 Oak Ridge Court
Manorville, New York, 11949

STATE OF NEW YORK · MICHAEL W. McKEOWN · LICENSED PROFESSIONAL ENGINEER · No. 062149
MICHAEL W. McKEOWN, P.E.

NO.	DATE	REVISION	BY
–	6-12-09	ISSUED FOR DEPARTMENT OF HEALTH APPROVAL	W.L.

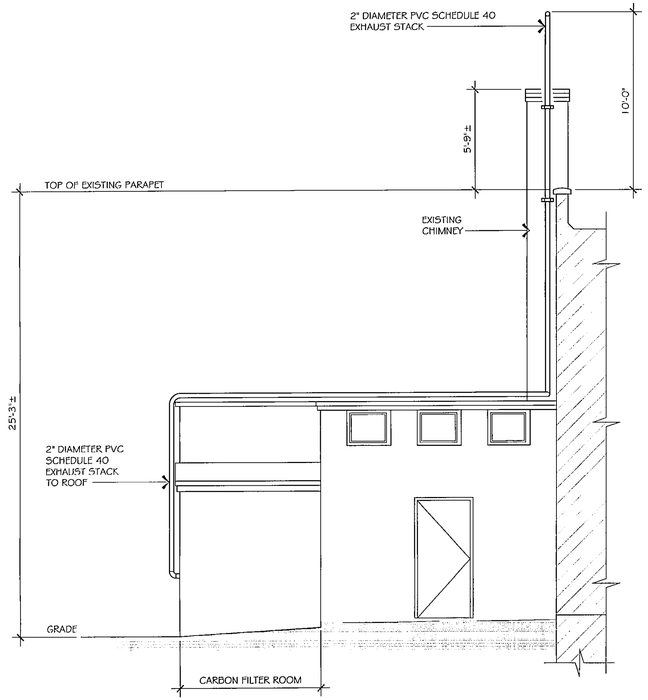
Air Permit Application for :
Schmuklers Cleaners
358-364 North Ave., New Rochelle, NY
Site # C360088

PROJECT NO.	052009
SCALE	AS NOTED
DATE	6-12-09
DRAWN BY	W.L.
CHECKED BY	M.W.M.

TITLE: Location Plan, Schematic Floor Plan and Building Elevations

DRAWING NO. AP-1

SH. 1 OF 4



PARTIAL LEFT SIDE ELEVATION - LOOKING NORTH

SCALE : ¼" = 1'-0"

Issued for Approval

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Bohemia, New York 11716

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6 Oak Ridge Court
Manorville, New York, 11949

STATE OF NEW YORK
MICHAEL W. McKEOWN
LICENSED PROFESSIONAL ENGINEER
NO. 082149
MICHAEL W. McKEOWN, P.E.

NO.	DATE	REVISION	BY
–	6.12.09	ISSUED FOR DEPARTMENT OF HEALTH APPROVAL	W.L.

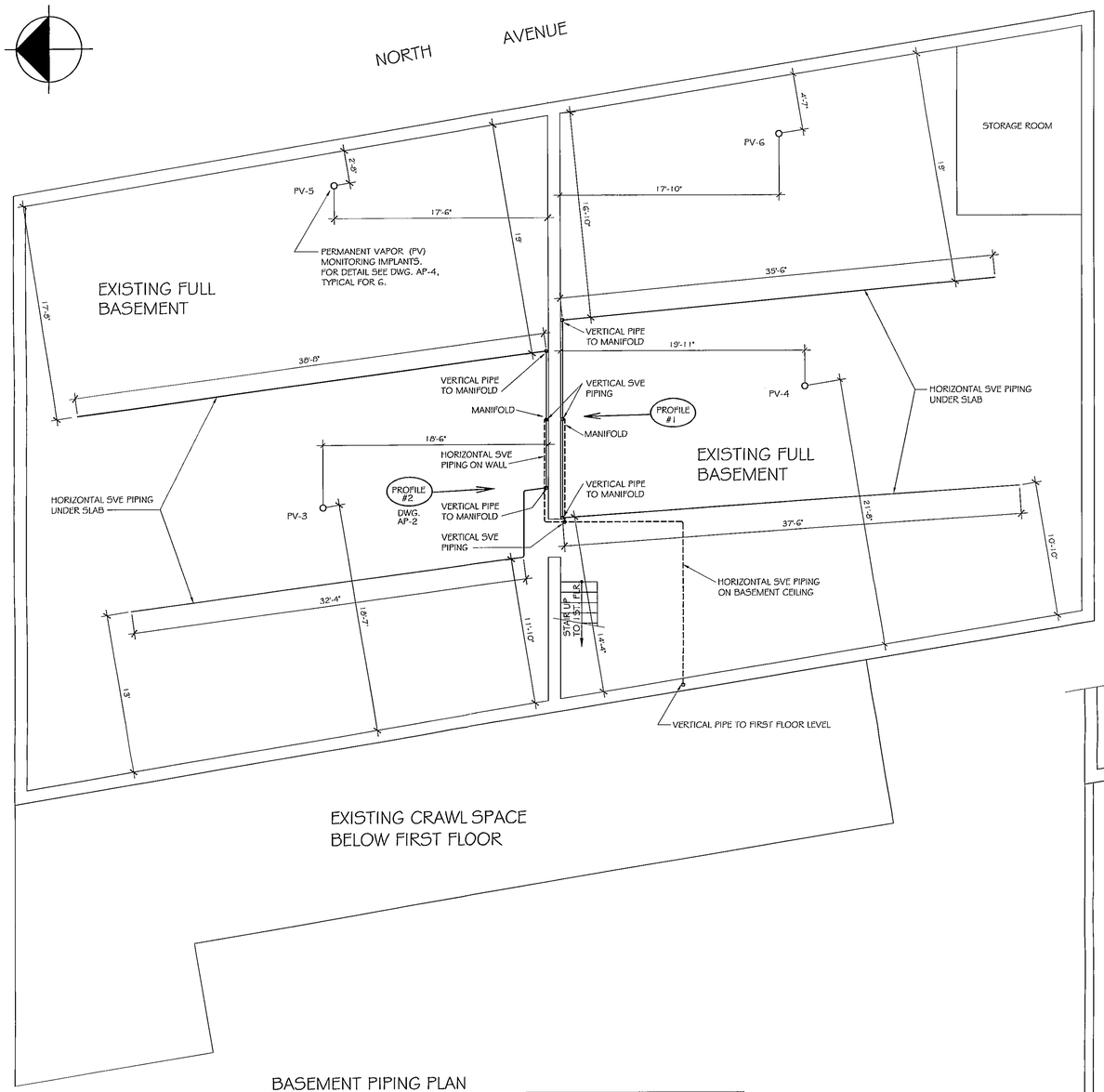
Air Permit Application for :
Schmuklers Cleaners
358-364 North Ave., New Rochelle, NY
Site # C360088

PROJECT NO. 052009
SCALE AS NOTED
DATE 6-12-09
DRAWN BY W.L.
CHECKED BY M.W.M.

TITLE
Building Elevations

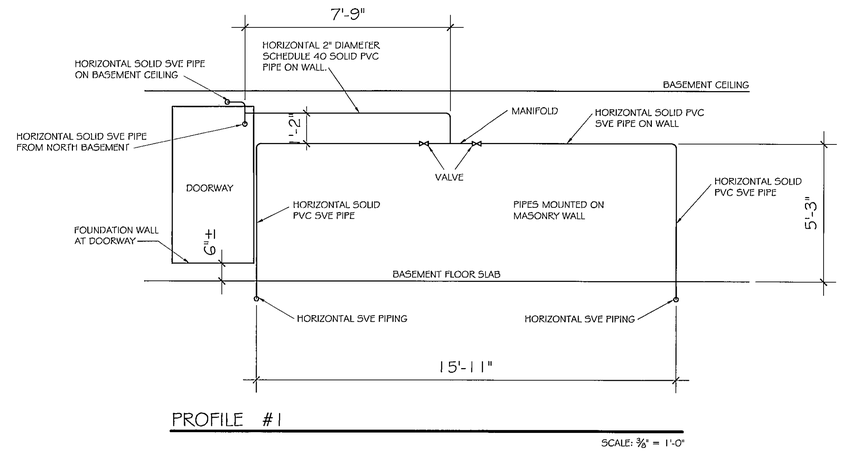
DRAWING NO.
AP-2

SH. 2 OF 4



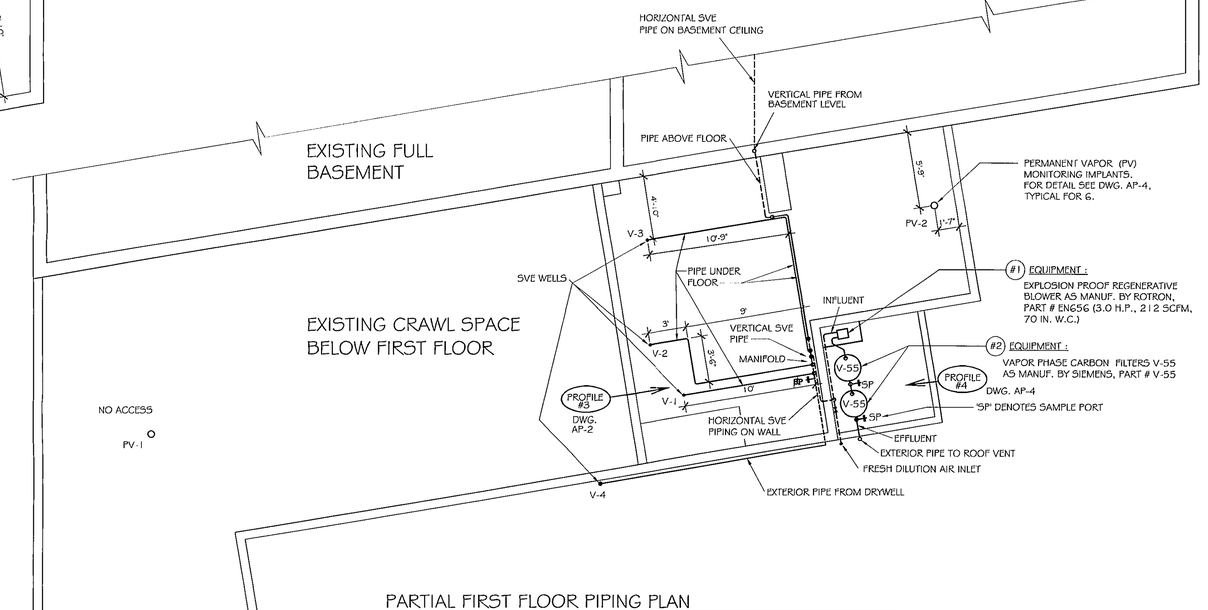
BASEMENT PIPING PLAN

SCALE: 3/16" = 1'-0"



PROFILE #1

SCALE: 3/8" = 1'-0"



PARTIAL FIRST FLOOR PIPING PLAN

SCALE: 3/16" = 1'-0"

DRAWING ALTERATION

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Bohemia, New York 11716

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6 Oak Ridge Court
Manorville, New York, 11949

STATE OF NEW YORK · MICHAEL W. McKEOWN · No. 082149 · LICENSED PROFESSIONAL ENGINEER

MICHAEL W. McKEOWN, P.E.

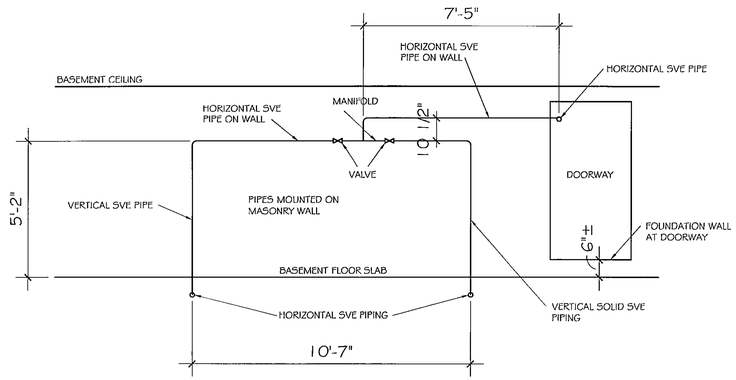
NO.	DATE	REVISION	BY
--	6.12.09	ISSUED FOR DEPARTMENT OF HEALTH APPROVAL	W.L.

Air Permit Application for :
Schmuklers Cleaners
358-364 North Ave., New Rochelle, NY
Site # C360088

PROJECT NO.	052009
SCALE	AS NOTED
DATE	6.12.09
DRAWN BY	SM
CHECKED BY	M.W.M.

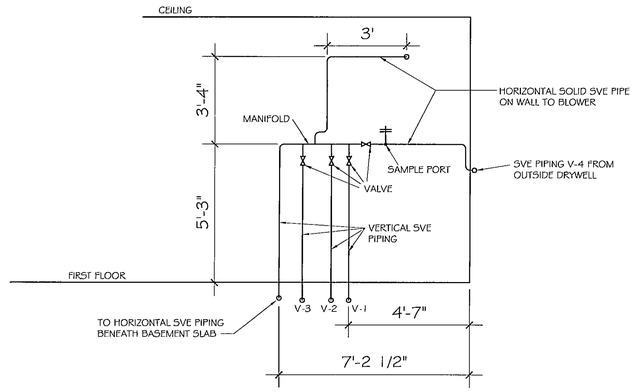
TITLE
Part Plans and Schematic Piping Elevations

DRAWING NO.
AP-3
SH. 3 OF 4



PROFILE #2

SCALE: 3/8" = 1'-0"



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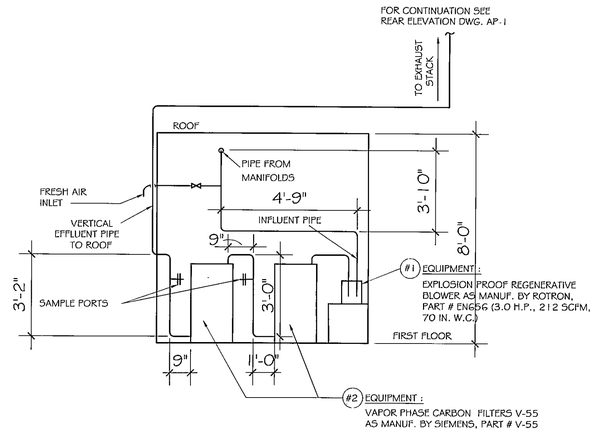
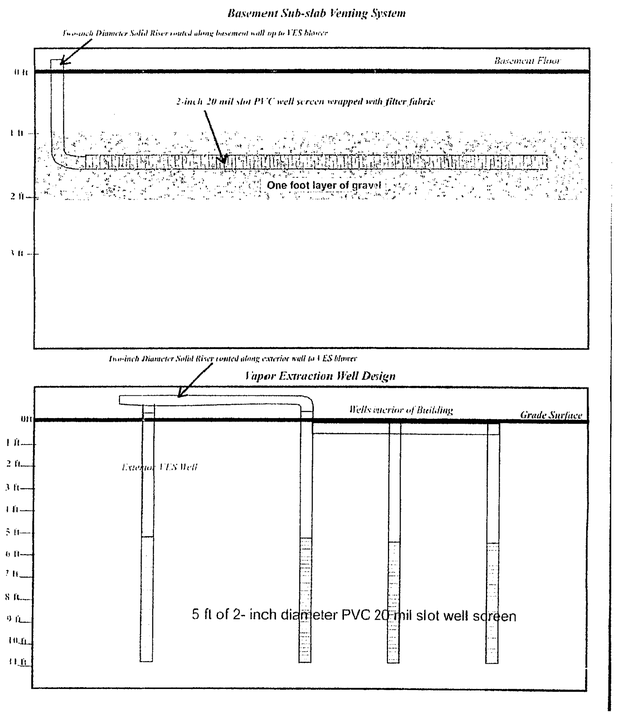
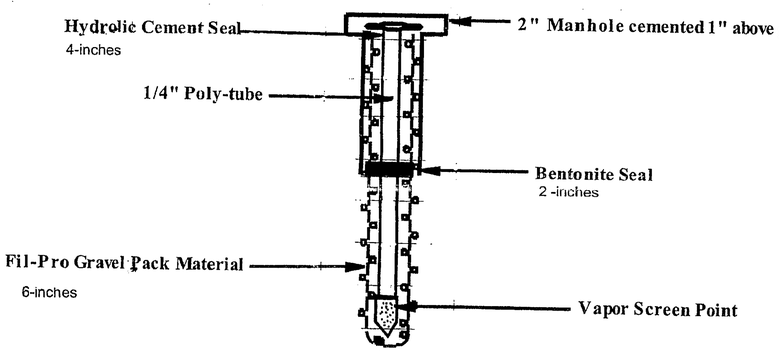
SCALE: 3/8" = 1'-0"



PROFILE #4

SCALE: 3/8" = 1'-0"





PERMANENT VAPOR (VP) MONITORING IMPLANTS

SCALE: NONE

Issued for Approval

DRAWING ALTERATION

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Bohemia, New York 11716

Michael W. Mckeown, P.E.
6 Oak Ridge Court
Manorville, New York, 11949

STATE OF NEW YORK MICHAEL W. McKEOWN LICENSED PROFESSIONAL ENGINEER No. 082148
MICHAEL W. McKEOWN, P.E.

NO.	DATE	REVISION	BY
–	6.12.09	ISSUED FOR DEPARTMENT OF HEALTH APPROVAL	W.L.

Air Permit Application for :
Schmuklers Cleaners
358-364 North Ave., New Rochelle, NY
Site # C360088

PROJECT NO.	052009
SCALE	SCALE: 3/8"= 1'-0"
DATE	6.12.09
DRAWN BY	SM
CHECKED BY	M.W.M.

TITLE: Piping Profiles

DRAWING NO.: AP-4

SH. 4 OF 4

APPENDIX-E

Flex Hose Specs

All Weather EDPM/Polyethylene Suction/Discharge Hose

Made in U.S.A. GOODYEAR

No. 1ZMY4

No. 1ZMZ2

No. 1ZMZ8

No. 1ZLP9

- **Max. temperature: 180°F**
- **Max. vacuum: 29" Hg**

Goodyear Green Hornet® hose has unique material properties shared between PVC and rubber suction hose. It is lighter weight and lower cost than rubber, but more flexible in cold weather and more durable than PVC. Smooth bore tube minimizes material buildup and resists a variety of chemicals found in agricultural and sanitary industries. Slightly corrugated outer helix promotes abrasion resistance and extends hose life. Hose can be used in both suction and discharge applications.

Uses: For waste management, construction, agricultural, marine, and manufacturing applications.

Hose Inside Dia. (In.)	Hose Length (Ft.)	Fittings	Fitting Size (NPSM)	Hose Outside Dia. (In.)	Bend Radius (In.)	Max. Pressure (psi)	Item No.	$ Each	Shpg. Wt.
Aluminum/Brass Threaded M + F									
1½	20	Aluminum Male x Female w/Brass Swivel	1½	1.86	4.0	50	1ZMY3	65.40	8.0
2	20	Aluminum Male x Female w/Brass Swivel	2	2.40	5.0	50	1ZMY4	94.90	14.0
3	20	Aluminum Male x Female w/Brass Swivel	3	3.47	12.0	45	1ZMY5	179.50	24.0
4	20	Aluminum Male x Female w/Brass Swivel	4	4.67	18.0	40	1ZMY6	302.00	45.0
1½	25	Aluminum Male x Female w/Brass Swivel	1½	1.86	4.0	50	1ZMY7	76.70	10.0
2	25	Aluminum Male x Female w/Brass Swivel	2	2.40	5.0	50	1ZMY8	110.40	17.0
3	25	Aluminum Male x Female w/Brass Swivel	3	3.47	12.0	45	1ZMY9	224.25	31.0
Aluminum Quick Coupling x Nipple									
1½	20	1½" Aluminum Female Camlock x Steel MNPT	—	1.86	4.0	50	1ZMZ1	84.65	10.0
2	20	2" Aluminum Female Camlock x Steel MNPT	—	2.40	5.0	50	1ZMZ2	114.30	15.0
3	20	3" Aluminum Female Camlock x Steel MNPT	—	3.47	12.0	45	1ZMZ3	210.00	26.0
4	20	4" Aluminum Female Camlock x Steel MNPT	—	4.67	18.0	40	1ZMZ4	325.75	45.0
1½	25	1½" Aluminum Female Camlock x Steel MNPT	—	1.86	4.0	50	1ZMZ5	94.10	11.0
2	25	2" Aluminum Female Camlock x Steel MNPT	—	2.40	5.0	50	1ZMZ6	133.80	17.0
3	25	3" Aluminum Female Camlock x Steel MNPT	—	3.47	12.0	45	1ZMZ7	239.00	39.0
Aluminum Quick Coupler									
1½	25	1½" Aluminum Cam and Groove	—	1.86	4.0	50	1ZMZ8	96.50	11.0
2	25	2" Aluminum Cam and Groove	—	2.40	5.0	50	1ZMZ9	136.10	17.0
3	25	3" Aluminum Cam and Groove	—	3.47	12.0	45	1ZNA1	245.25	34.0
1½	50	1½" Aluminum Cam and Groove	—	1.86	4.0	50	1ZNA2	162.50	20.0
2	50	2" Aluminum Cam and Groove	—	2.40	5.0	50	1ZNA3	223.50	30.0
3	50	3" Aluminum Cam and Groove	—	3.47	12.0	45	1ZNA4	411.75	59.0
Bulk Hose Without Fittings									
1¼	100	—	—	1.50	3.0	50	1ZLP9	189.75	22.0
1½	100	—	—	1.80	4.0	50	1ZLR1	204.25	32.0
2	100	—	—	2.40	5.0	50	1ZLR2	287.75	54.0
3	100	—	—	3.50	9.0	45	1ZLR3	584.00	109.0
4	100	—	—	4.70	16.0	40	1ZLR4	953.50	198.0

Clear PVC Suction/Discharge Hose

Made in U.S.A. GOODYEAR

No. 1ZMX3

No. 1ZMX9

No. 4XR71

- **Temperature range: 15° to 158°F**

Clear PVC allows for visual confirmation of material flow and is lightweight for ease of handling. Corrugated cover provides increased flexibility. Smooth inner bore surface provides high flow rates and easy cleaning. Handles pressure, vacuum, and gravity flow applications. All fittings include gasket.

Uses: For agricultural, industrial, construction, and septic tank cleaning applications.

Hose Inside Dia. (In.)	Hose Length (Ft.)	Fittings	Fitting Size (NPSM)	Hose Outside Dia. (In.)	Bend Radius (In.)	Max. Pressure (psi)	Item No.	$ Each	Shpg. Wt.
Aluminum/Brass Threaded M + F									
1	20	Aluminum Male x Female w/Brass Swivel	1	1.23	1.5	60	1ZMW9	84.45	5.1
1¼	20	Aluminum Male x Female w/Brass Swivel	1¼	1.52	2.5	50	1ZMX1	90.85	7.0
1½	20	Aluminum Male x Female w/Brass Swivel	1½	1.78	3.0	50	1ZMX2	93.70	9.0
2	20	Aluminum Male x Female w/Brass Swivel	2	2.36	3.2	40	1ZMX3	132.30	14.0
3	20	Aluminum Male x Female w/Brass Swivel	3	3.48	6.5	35	1ZMX4	251.50	25.0
4	20	Aluminum Male x Female w/Brass Swivel	4	4.50	10.5	35	1ZMX5	369.50	41.0
Aluminum Quick Coupler									
1	20	1" Aluminum Female Camlock x Steel MNPT	—	1.23	1.5	60	1ZMX6	77.05	5.2
1¼	20	1¼" Aluminum Female Camlock x Steel MNPT	—	1.52	2.5	50	1ZMX7	92.15	8.2
1½	20	1½" Aluminum Female Camlock x Steel MNPT	—	1.78	3.0	50	1ZMX8	97.45	10.0
2	20	2" Aluminum Female Camlock x Steel MNPT	—	2.36	3.2	40	1ZMX9	139.80	15.0
3	20	3" Aluminum Female Camlock x Steel MNPT	—	3.48	6.5	35	1ZMY1	262.00	27.0
4	20	4" Aluminum Female Camlock x Steel MNPT	—	4.50	10.5	35	1ZMY2	382.25	42.0
Bulk Hose Without Fittings									
1	100	—	—	1.23	1.5	60	4XR68	119.00	17.6
1¼	100	—	—	1.52	2.5	50	4XR69	164.00	25.1
1½	100	—	—	1.78	3.0	50	4XR70	175.00	28.2
2	100	—	—	2.36	3.2	40	4XR71	249.00	49.0
3	100	—	—	3.48	6.5	35	4XR72	409.00	94.0
4	100	—	—	4.50	10.5	35	4XR73	579.00	123.0

APPENDIX-F

System Venting (Door Louvers)

APPENDIX - G

Monitoring frequency letter

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 • **Fax:** (518) 402-9679
Website: www.dec.ny.gov

Joe Martens
Commissioner

August 22, 2013

Mr. Hal Shapiro
HNJ Realty, LLC
364 North Avenue #107
New Rochelle, NY 10801

Re: Schmukler's Dry Cleaners
Brownfields Cleanup Project Site No. C360088
City of New Rochelle, Westchester County

Dear Mr. Shapiro:

The New York State Department of Environmental Conservation (Department) in consultation with the New York State Department of Health (NYSDOH) has reviewed your request to reduce the frequency of monitoring of the combined soil vapor extraction system/sub-slab depressurization system (SVES/SSDS) currently operating at the above-referenced site. The request, which was presented to the Department on July 29, 2013 via an email from your consultant Berninger Environmental, Inc., is for a reduction from monthly monitoring to quarterly monitoring of the SVES/SSDS.

Given that the monitoring data presented over the last three years demonstrates decreased contaminants of concern in the influent and pressure data indicates that the SVES/SSDS provides adequate negative pressure across the entire building slab, the Department grants the reduction in monitoring frequency from monthly to quarterly. The next monitoring report must be submitted in October 2013.

If you have any questions or concerns, please contact me at (518) 402-9662, or via email at kathomps@gw.dec.state.ny.us.

Sincerely,

Kiera Thompson

Kiera Thompson
Project Manager
Remedial Bureau C, Section B
Division of Environmental Remediation

cc: Natasha Court, WCDOH

ec: W. Berninger - BEI
J. Halpin – BEI
N. Walz/C. Bethoney – NYSDOH
D. Crosby, NYSDEC

Berninger Environmental Inc.
groundwater consultants and geologists
90-B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528

July 29, 2013

Mrs. Kiera Thompson
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C
625 Broadway, 11th Floor
Albany, New York 12233-7015

Re: Schmukler's Dry Cleaners, SVE/SSDS Monitoring Frequency
Brownfield Cleanup Agreement Site No. C360088
City of New Rochelle, Westchester County, NY

Dear Mrs. Thompson,

Introduction

The following letter issued by Berninger Environmental Incorporated (BEI) on behalf of our client HNJ Reality LLC, is a request to obtain approval from the New York State Department of Environmental Conservation (NYSDEC) regarding the monitoring frequency at the above mentioned site. Currently, site monitoring is conducted on the previously installed Soil Vapor Extraction/ Sub-slab Depressurization System (SVE/SSDS) each month. BEI on behalf of HNJ Realty would like to request that monthly monitoring operations be reduced to quarterly monitoring operations as conclusive evidence in order to substantiate this request is provided below.

SVE/SSDS Historical Evidence

Over the last few years BEI has observed drastic influent PID reductions. PID readings that once averaged approximately 120 ppm to 150 ppm during the 2010 monitoring period now range from 45 ppm to 75 ppm in recent months. Please see the attached Figure-1 which demonstrates influent and effluent PID readings from the commencement of the SVE/SSDS system to the present day. PCE concentrations have also significantly declined according to certified lab data collected over the past several years on the influent. Please see Figure-2 for tabulated lab data showing the declination of influent PCE concentrations.

Overall, the system has been operating twenty-four (24) hours a day for seven (7) days a week since it's inception in November of 2009. Monthly influent and effluent sampling has been conducted since November 2009 and we feel that after three (3) years of continuous operation the active system has removed a substantial amount of vapors from the point source area. Reductions in groundwater contamination have also been noticed in the area known as the, "former dry cleaning equipment room" due to the volatilizing effects the system has had on the contaminated groundwater.

The system has also maintained adequate air flow readings throughout the operational period with vacuum readings on each individual vapor well ranging from approximately 4.0 - 4.5 in/H2O. Please refer to Figure-3 for more on the vacuum readings.

Frequency Request

Based upon the above mentioned historical data, BEI would like to request that the Department approve the monitoring and sampling reduction from monthly influent and effluent sampling to quarterly effluent sampling only. BEI perceives that the functioning of the system will remain adequate despite the monitoring and sampling reduction. The integrity of the on-going source removal is not expected to be compromised due to this frequency reduction nor will it have any effect on the systems ability to continually remove source material via vapor extraction.

Thank You ,

Justin Halpin
Project Manager

Walter Berninger
President/Env.Consultant

Schmukler's Cleaners, New Rochelle NY

PID Readings For Inf./Eff. Carbon Drum Sample Points ppm

				Before Drum Replaced		
Date	**INF.**	**Middle**	**EFF.**	**INF.**	**Middle**	**EFF.**
17-Sep-10	89.00	0.70	0.00			
11-Oct-10	156.00	0.80	0.00			
3-Nov-10	98.60	1.75	0.00			
3-Dec-10	145.10	2.30	0.00			
3-Jan-11	87.42	2.60	0.00			
4-Feb-11	38.70	4.20	0.00			
1-Mar-11	92.60	7.30	0.00			
4-Apr-11	165.00	3.30	0.00	166.00	3.30	0.10
9-May-11	18.04	0.00	0.00			
24-Jun-11	12.10	2.90	0.00			
21-Jul-11	34.00	0.70	0.00			
2-Aug-11	40.70	0.70	0.00			
13-Sep-11	18.10	1.40	0.00			
3-Oct-11	16.90	0.00	0.00			
11-Nov-11	42.34	0.00	0.00	50.00	5.60	0.20
5-Dec-11	37.40	2.30	0.00			
18-Jan-12	38.50	1.90	0.00			
9-Feb-12	40.23	0.50	0.00			
22-Mar-12	46.80	0.90	0.00			
30-Apr-12	54.60	1.30	0.00			
22-May-12	51.30	1.70	0.00			
13-Jul-12	59.93	4.20	0.20			
8-Aug-12	61.5	1.2	0.2			
6-Sep-12	74.3	4.5	1.1			
3-Oct-12	60.00	1.00	0.00	33.2	18.6	3.3
13-Nov-12	51.20	6.30	0.00			
6-Dec-12	45.60	5.30	0.00			
10-Jan-13	77.90	4.60	0.00			

* when carbon drum replaced PID readings are taken before and after replacement

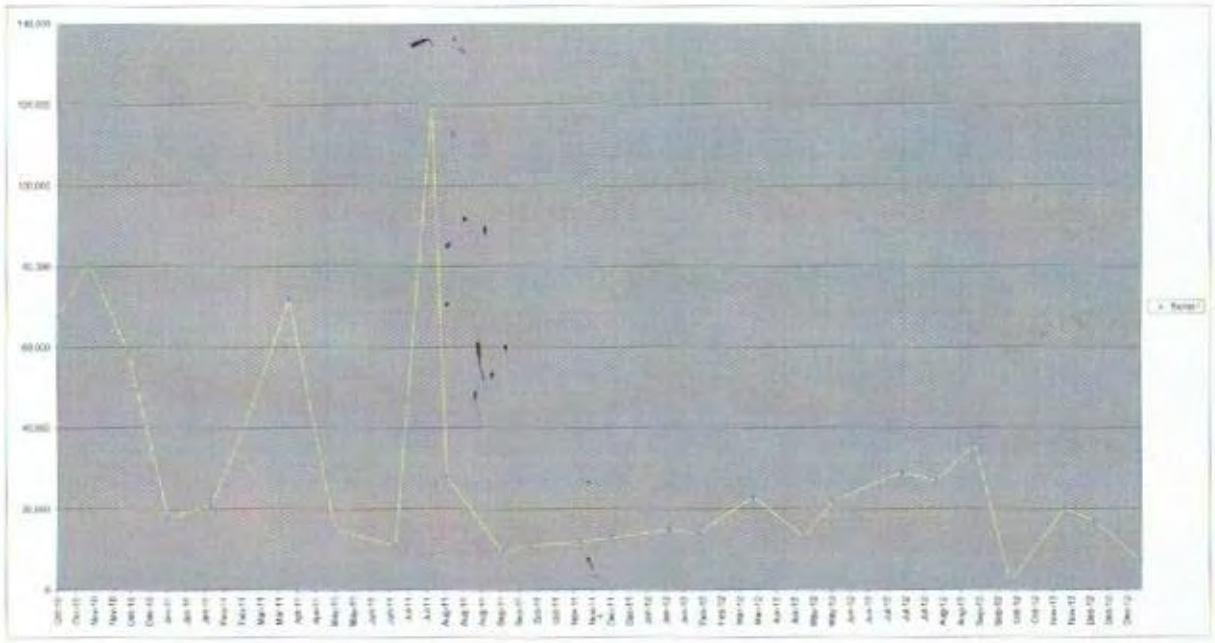
FIGURE-1

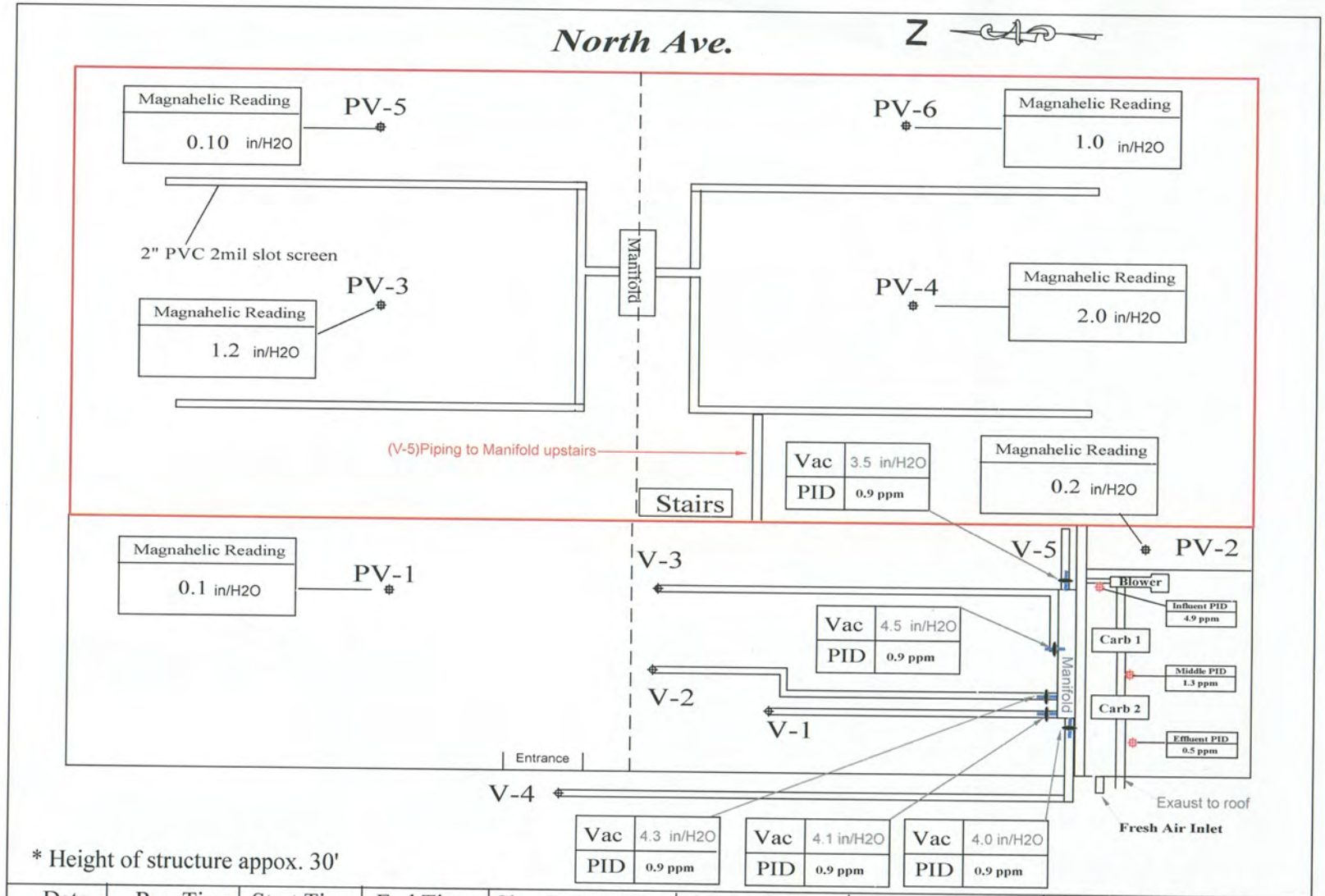
Schmukler's Cleaners, New Rochelle NY

Influent PCE Lab Concentrations ppbv

FIGURE-2

Date		Influent PCE ppbv	
Oct-10		68,000	
Nov-10		81,000	
Dec-10		59,000	
Jan-11		18,000	
Feb-11		21,000	
Mar-11		40,000	
Apr-11		72,000	
May-11		15,000	
Jun-11		11,000	
Jul-11		120,000	
Aug-11		28,000	
Sep-11		9,400	
Oct-11		11,000	
Nov-11		12,000	
Dec-11		13,000	
Jan-12		15,000	
Feb-12		14,000	
Mar-12		23,000	
Apr-12		13,000	
May-12		22,000	
Jul-12		29,000	
Aug-12		27,000	
Sep-12		36,000	
Oct-12		1,900	
Nov-12		20,000	
Dec-12		17,000	
Jan-13		7,200	





* Height of structure appox. 30'

Date	Run Time	Start Time	End Time	Shut Down Time	Height of Stack	Vacuum Flow Rate	Exit Velocity	Exit Temp.
2/26/09	3 Hours	9:30am	12:30pm	12:30pm	10' above *Structure	7.59 ft3/min	397 ft/min 9.21 ft3/min	13 degrees C

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90-B Knickerbocker Avenue Phone # (631) 589-6521
Bohemia, New York 11716 Fax #(631) 589-6528

Figure-3

Schmuklers Cleaners
358-364 North Ave.
New Rochelle, NY
Site# C360088
SVE Pilot Test

Key

- Basement Area
- Check Valve
- Permanent Vapor Point
- Sample Point
- Vapor Extraction Well

Drawn by: JGH

APPENDIX-H

PlumeStop cut sheet

PlumeStop® Liquid Activated Carbon™ Technical Description

PlumeStop Liquid Activated Carbon is an innovative groundwater remediation technology designed to rapidly remove and permanently degrade groundwater contaminants. PlumeStop is composed of very fine particles of activated carbon (1-2µm) suspended in water through the use of unique organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix, binding to the aquifer matrix, rapidly removing contaminants from groundwater, and expediting permanent contaminant biodegradation.

This unique remediation technology accomplishes treatment with the use of highly dispersible, fast-acting, sorption-based technology, capturing and concentrating dissolved-phase contaminants within its matrix-like structure. Once contaminants are sorbed onto the regenerative matrix, biodegradation processes achieve complete remediation at an accelerated rate.

Distribution of PlumeStop in water

To see a list of treatable contaminants with the use of PlumeStop, view the Range of Treatable Contaminants Guide.

Chemical Composition

- Water - CAS# 7732-18-5
- Colloidal Activated Carbon ≤2.5 - CAS# µm 7440-44-0
- Proprietary Additives

Properties

- Physical state: Liquid
- Form: Aqueous suspension
- Color: Black
- Odor: Odorless
- pH: 8 - 10

Storage and Handling Guidelines

Storage
Store in original tightly closed container
Store away from incompatible materials
Protect from freezing

Handling
Avoid contact with skin and eyes
Avoid prolonged exposure
Observe good industrial hygiene practices
Wash thoroughly after handling
Wear appropriate personal protective equipment

PlumeStop® Liquid Activated Carbon™ Technical Description

Applications

PlumeStop is easily applied into the subsurface through gravity-feed or low-pressure injection.

Health and Safety

Wash hands after handling. Dispose of waste and residues in accordance with local authority requirements. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: PlumeStop SDS.

REGENESIS

www.regenesis.com
1011 Calle Sombra, San Clemente CA 92673
949.366.8000

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All other trademarks are the property of their respective owners.

APPENDIX-I

GeoSorb cut sheet

GO TO GEOTECH

Selective Product Recovery

GeoSorb Selective Product Recovery

The GeoSorb is designed to recover hydrocarbons from 2" or 4" (5cm or 10cm) and larger wells. The GeoSorb System consists of a stainless steel screened cage assembly and a product selective absorbent. The system is lowered down the well where it passively absorbs free product.

FEATURES

- **Designed for 2" (5cm) or 4" (10cm) and larger wells**
- **Designed to recover the product, not the water**
- **Absorbent sock refills available in cases of 12, or individually**
- **Heavy-duty #304 stainless steel screen assembly**
- **FEP coated stainless steel hanger**
- **Ballast weight for optimal submergence**

OPERATION

Prior to use, always check depth and thickness of product layer in well!

Simple to use, just 4 easy steps:

1. Insert sock into stainless steel screen assembly. Do not lower sock down well without screen assembly.
2. Attach safety cable or cord to the hanger on the screen assembly.
3. Slowly lower into the well to maximize exposure to product layer. In long-term applications, set unit to accommodate water level fluctuations over the full length of screened assembly.
4. Retrieve screen assembly, remove used sock, dispose according to local ordinances.

SPECIFICATIONS

	2" GeoSorb	4" GeoSorb
Screen Material	#304 SS, perforated	#304 SS, perforated
Screen Mesh Holes Size	5⁄32" dia. x 3⁄16" stg. ctrs. (3.97mm x 4.76mm)	5⁄32" dia. x 3⁄16" stg. ctrs. (3.97mm x 4.76mm)
Available Screen Length	36.0" (91.4cm)	36.0" (91.4cm)
Screen Outside Diameter	1.750" (44.5mm)	3.670" (93.2mm)
Actual Overall Assy. Length	37 1⁄8" (94.3cm)	36 5⁄8" (93.0cm)
Weight w/Ballast	1.73 lbs. (.78 kg)	5.19 lbs. (2.35 kg)
Min. Well Inside Diameter	2" (51mm)	4" (102mm)
Absorbent Sock Diameter	1.5" (38.1mm)	3.0" (76.2mm)
Absorbent Sock Length	36" (91.4cm)	36" (91.4cm)
Absorbent Sock Material	Polypropylene filler contained in a white polypropylene fabric sock	Polypropylene filler contained in a white polypropylene fabric sock
Rated Absorption*	2.16 gal. (8.2 L) per case of 12 .72 qt. (.68L) per sock	8.52 gal. (32.3L) per case of 12 2.8 qt. (2.65L) per sock

*The product absorption rate is determined by the viscosity of the product and can vary depending on site conditions.

CALL GEOTECH TODAY (800) 833-7958

Geotech Environmental Equipment, Inc.
2650 East 40th Avenue • Denver, Colorado 80205
(303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242
email: sales@geotechenv.com website: www.geotechenv.com

TABLES

Table-1
Groundwater Parameters

Site Name: Schmuklers **Ground Water Data Collection Form** **Date:**

Table-1

Sampler(s):

Well	Time	DTW	DTP	ORP	PH	Temp	D.O	Cond.
MW-2								
MW-3								
MW-6								
MW-7								
MW-8								
MW-9								
MW-10								
MW-11								
MW-12								
BW-1								
BW-2								
BW-4 (next to MW-6)								

Table-2
TEA analysis

Schmukler's Cleaners
358-364 North Avenue
New Rochelle, New York
Table-2
TEA Testing

All units are mg/L

Sample I.D.	Sulfate	Ferrous Iron
MW-2		
MW-3		
MW-4		
MW-5		
MW-6		
MW-7		
MW-8		
MW-9		
MW-10		
MW-11		
MW-12		
BW-1		
BW-2		
BW-4/MW-6		

Samples collected on