BAYVILLE VILLAGE CLEANERS
NYSDEC SITE NUMBER: V00220
290 BAYVILLE AVENUE
BAYVILLE, NASSAU COUNTY, NEW YORK 11560

FINAL
SITE MANAGEMENT PLAN

Prepared for:
Bayville Village Cleaners, Inc., Volunteer

Voluntary Cleanup Agreement: W1-0848-9903

Prepared by:
CASHIN TECHNICAL SERVICES, INC.
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788
(631) 348-7600

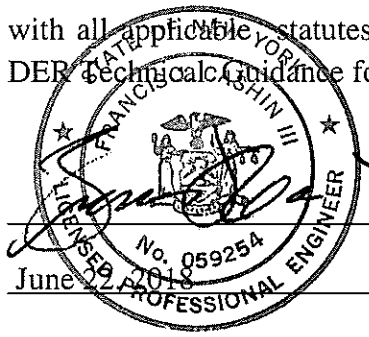
Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

FINAL
JUNE 22, 2018

CERTIFICATION STATEMENT

I, Francis Cashin III, P.E., certify that I am currently a registered professional engineer in the State of New York and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



_____ P.E.

June 22, 2018 _____ DATE

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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
CTS	Cashin Technical Services, Inc.
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines

SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan (SMP):

Site Identification: NYSDEC Site #V00220, Bayville Village Cleaners, Inc., 290 Bayville Avenue, Village of Bayville, Nassau County New York 11560

Institutional Controls:	1. The subject property may be used for commercial purposes 2. Declaration of Covenants and Restrictions 3. All Engineering Controls (ECs) must be inspected at a frequency and in a manner defined in the SMP.
Current and Future Use of the Site: Permitted future uses (commercial and industrial) must comply with 6 NYCRR 375-1.8(g)(2)(iii) for commercial uses; and 6 NYCRR 375-1.8(g)(2)(iv) for industrial uses.	
Engineering Controls:	1. Vapor Mitigation System Sub-Slab Depressurization (SSD) System
Inspections:	Frequency
1. SSD System	Annually
Monitoring:	Frequency
1. SSD System Components	Annually
2. Magnehelic Differential Pressure	Annually
3. SSD System Ports – PID Monitoring	Annually
Maintenance:	Frequency
1. SSD System Maintenance (Fan)	Annually
Reporting:	Frequency
1. Soil Vapor Sampling	Annually
2. Groundwater Sampling	Annually
3. Post Remediation Sampling	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Bayville Village Cleaners site (Bayville Village Cleaners, Inc., Volunteer) located in the Village of Bayville, Nassau County, New York (hereinafter referred to as the "Site"). See Figure 1 – Site Location Map. The Site is currently in the New York State (NYS) Voluntary Cleanup Program (VCP) Site No. V00220 which is administered by New York State Department of Environmental Conservation (NYSDEC).

Bayville Village Cleaners, Inc. entered into a Voluntary Cleanup Agreement (VCA) with NYSDEC to remediate the Site, dated November 23, 1999 as amended on June 20, 2013 and August 24, 2016, respectively. A figure showing the Site location and boundaries is provided in Figure 2 – Site Sketch. The exact boundaries of the Site are shown on the updated survey map and are fully described in the metes and bounds description for the Site, both of which are provide in Figure 7 - Survey Map with Metes and Bounds Description.

After completion of the remedial work, some contamination was left at the Site, which is hereafter referred to as "remaining contamination". A sub-slab depressurization (SSD) System was used as an Engineering Control and has been incorporated into the Site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. A Declaration of Covenants and Restrictions granted to the NYSDEC, and recorded with the Nassau County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the Declaration of Covenants and Restrictions is extinguished. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Declaration of Covenants and Restrictions and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Declaration of Covenants and Restrictions. Failure to properly implement the SMP is a violation of the Declaration of Covenants and Restrictions, which is a ground for the revocation of NYSDEC's Release and Covenant Not to Sue letter.

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375; and the November 23, 1999 VCA as executed by the Commissioner of NYSDEC (Site No. V00220, Index No. W1-0848-9903), including its two (2) amendments.

- The VCA was modified (Amendment No. 1) on June 20, 2013 (Index No.W1-0848-13-04) to enable closure of the VCP project for the Site, which requires, the development and implementation of this SMP, submission of a FER, recording of a Declaration of Covenants and Restrictions with the Nassau County Clerk's Office, and the NYSDEC's issuance of a Release and Covenant Not to Sue letter upon completion of the remedial program for the Site.

- The VCA was modified again (Amendment No. 2) on August 24, 2016 changing the "Contemplated Use" as described in the Specific Definitions Paragraph 1.E.1 of the Agreement to read as follows:

  Contemplated Use: commercial use as defined in 6 NYCRR Section 375-1.8(g)(2)(iii), which allows for Industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv).

Agency approval documents including the executed VCA and the two (2) amendments are included in Appendix XI – Agency Approval Documents.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of Site contacts for persons involved with the Site is provided in Appendix I of this SMP.

This SMP was prepared by Cashin Technical Services, Inc. on behalf of Bayville Village Cleaners, Inc., in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Declaration of Covenants and Restrictions for the Site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions. In accordance with the Declaration of Covenants and Restrictions for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in Site use that are required under the terms of the VCA, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

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

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the VCA, and all approved work plans and reports, including this SMP.

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

Table 1 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix I.

Table 1: Notifications*

Name	Contact Information
NYSDEC Division of Environmental Remediation Project Manager **Jahan Reza, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790	(631) 444-0242 jahan.reza@dec.ny.gov
NYSDEC Regional Hazardous Waste Remediation Engineer **Walter J. Parish, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790 and Kelly Lewandowski, P.E. Chief, Site Control Section NYSDEC – Albany Central Office	(631) 444-0241 walter.parish@dec.ny.gov (518) 402-9569

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located in the Village of Bayville, Nassau County, New York and is identified as Section 28, Block 20 and Lot 58 on the Nassau County Tax Map (see Figure 6. The Site is an approximately 0.11-acre area and is bounded by Bayville Avenue to the north, residential homes to the south, Tri-County Installations, Inc. (commercial plumbing and heating business) to the east, and 17th Street to the west (see Figure 2 – Site Sketch). The boundaries of the Site are more fully described on Figure 7 – Survey Map with Metes and Bounds Description. The owner of the Site parcel at the time of issuance of this SMP is:

FE-FA Corporation

c/o Zubair Khalid

160 West 97th Street, Apt. 10G

New York, New York 10025

A full copy of the executed Declaration of Covenants and Restrictions and its recording page (dated March 17, 2017) with the Nassau County Clerk's Office is provided in Appendix IV.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a single story masonry building that is 1,440 sf in size. The Site is zoned for commercial use and will continue to be used as an active commercial dry cleaner facility, although it no longer uses PCE.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include mixed commercial, residential and retail properties. The Site is bounded by Bayville Avenue to the north, residential homes to the south, Tri-County Installations, Inc. (commercial plumbing and heating business) to the east, and 17th Street to the west (see Figure 1 - Site Location Plan and Figure 2 - Site Sketch).

2.2.2 Geology

Subsurface soils are composed mainly of an upper layer of fine, silty sand transitioning to coarse sand at a depth of approximately six feet below grade.

2.2.3 Hydrogeology

The water table was encountered within approximately eight to ten feet below grade fluctuating in elevation on a seasonal basis. The Site-specific groundwater flow direction was found to be to the north.

No groundwater contour maps or monitoring well construction logs were available at the time of this SMP; however, they are most likely included in previous investigation reports prepared by P.W. Grosser Consulting Engineer and Hydrogeologist for the subject Site.

2.3 Investigation and Remedial History

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved Revised Remedial Action Work Plan (RAWP) for the Bayville Village Cleaners, Inc. Site, last revised April 2011.

The following summarizes the extent of contamination for the Bayville Village Cleaners, Inc. Site, a NYSDEC Voluntary Cleanup Program site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and applicable guidance and described in the Decision Document dated August 2011.

The contaminant(s) of concern identified at this Site are:

Tetrachloroethylene (PCE)
Trichloroethene (TCE)

The contaminant(s) of concern which exceeded the applicable standards, criteria and guidance values (SCGs) prior to remediation are:

- groundwater
- soil
- soil vapor
- indoor air

The NYSDEC, in consultation with the New York State Department of Health (NYSDOH), has selected installation of a Sub-Slab Depressurization (SSD) system, placement of an institutional control in the form of a deed restriction, a Site Management Plan as the remedy for the above referenced Site.

Nature and Extent of Contamination: The main contaminant of concern at the Site is PCE. The impacted media are soil, groundwater, indoor air and soil gas. To a lesser extent, the degradation product trichloroethene (TCE) has been detected in groundwater and soil gas. Based on CTS's vapor gas samples collected on November 7, 2014, elevated levels of TCE was detected in indoor air (AA-1) within the facility as shown in Table 2 (Vapor Gas Sampling Results) below. Levels of TCE will continue to be tested during annual indoor air quality sampling events and its source will be further investigated by completing a dry cleaning product inventory questionnaire as described in Section 4.2 below.

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

In May 1995, soil sampling conducted under the oversight of the Nassau County Department of Health (NCDH) found PCE concentrations as high as 36,000 parts per million (ppm) in surface soil (0-6 inches) collected by an evaporator pipe located outside the west side of the building. An additional 11 surface and subsurface soil samples were collected in 1996 under NCDH oversight which revealed PCE concentrations ranging from 0.130 ppm to 11,000 ppm. PCE concentrations generally diminished with depth. These sample results were compared to the recommended soil cleanup objective (SCO) for PCE of 1.4 ppm in TAGM #4046.

In 1996, prior to entering into the Voluntary Cleanup Program, the affected contaminated area of PCE containing soil materials (parking lot area located on the west side of the subject building) was excavated and 67.76 tons of contaminated soil was removed and disposed of off-site at a permitted disposal facility. 17 post excavation confirmatory soil samples were collected with residual PCE concentrations ranging from non-detect (ND) to 0.620 ppm. In February 2008, under the VCP, eight supplemental soil samples were collected from the former source area with PCE concentrations in the range of ND to 0.016 ppm in the former source area. The Protection of Groundwater SCO for PCE is 1.3 ppm and the commercial use SCO is 150 ppm. Based on this sampling, residual soil contamination is below the commercial use and protection of groundwater SCOs.

In 1996, groundwater samples were collected at the water table at eight on-site locations. PCE concentrations ranged from ND to 8,600 parts per billion (ppb). The NYS Groundwater Water Standard for PCE is 5 ppb. However, as a result of source removal, PCE levels in 2007 were found to have diminished significantly (ND to 6.4 ppb). In 2008, groundwater samples were collected at four on-site locations via a *Geoprobe* at 25' and 50' below grade. PCE was ND in all samples.

In 2009, PCE was detected in indoor air sampling at 65 micrograms per cubic meter of air (ug/m3). At that time, the NYSDOH “Air Guideline Value” for PCE in indoor air was 100 ug/m3. In September 2013 NYSDOH lowered their air guideline value for tetrachloroethene in ambient air from 100 micrograms per cubic meter (mcg/m3) to 30 mcg/m3. It should be noted that in 2009, the dry cleaners no longer used PCE in their dry cleaning processes.

Sub-slab soil gas was sampled twice, in 2008 and 2009, and revealed PCE levels at 2,500 ug/m3 and 2,200 ug/m3, respectively. The NYSDOH air guideline value for mitigation of PCE in sub-slab soil gas is 1,000 ug/m3. Exterior soil gas was sampled at five locations outside the building and revealed PCE in the range of 880 ug/m3 to 2,000 ug/m3.

A comprehensive history of the Site, regarding past environmental activities and investigations that were completed from May 1995 through to May 2007 is presented in the "Revised Site Investigation Work Plan" compiled by Walden Environmental Engineering, PLLC (Walden), dated May 17, 2007.

A "Site Investigation Report," dated December 9, 2008, compiled by Walden, contains the soil, groundwater, air/vapor sampling results (February 2008) from samples collected throughout the Site as proposed within the NYSDEC approved "Revised Site Investigation Work Plan".

A "Site Investigation Report Addendum," dated September 16, 2009, compiled by Walden, containing the air/vapor sampling results collected in March 2009 to confirm the results of the February 2008 sampling event as per NYSDEC request within the "Site Investigation Report: December 2008" letter dated January 16, 2009.

A "Remedial Action Work Plan," dated June 4, 2010, prepared by Walden to address the potential for soil vapor intrusion to impact the indoor air quality inside the building.

The NYSDEC issued a Decision Document on August 11, 2011 which selected sub-slab depressurization as the selected remedy for the Site.

A "Revised Remedial Action Work Plan," dated April 2011, prepared by Walden to address the potential for soil vapor intrusion to impact the indoor air quality inside the building.

CTS in conjunction with its contractor (East Coast GeoServices, LLC.) installed two (2) replacement permanent exterior soil vapor gas sampling points on November 7, 2014 as

described in Section 3.0 below. CTS designated the new permanent exterior soil vapor gas sampling points PPB-1 and PPB-5. These new locations are located on the north and south side of the subject building, respectively. Additionally, CTS performed remediation performance baseline soil vapor sampling activities to evaluate the effectiveness of the SSDS.

CTS in conjunction with its contractor (East Coast GeoServices, LLC.) installed one (1) replacement permanent exterior soil vapor gas sampling point on December 27, 2017. CTS designated the new permanent exterior soil vapor gas sampling point PPB-6. PPB-6 is located on the east side of the subject building along the adjacent commercial building driveway.

Additionally on December 27, 2017, CTS performed additional sampling of the groundwater, soil vapor, indoor air and cesspool per New York State Department of Health (NYSDOH) request to evaluate the current conditions on the Site and to determine if there are any ongoing off-site concerns to the adjacent residential dwelling to the south or to the adjacent commercial plumbing business to the east. Sampling was conducted during the start of the 2017-2018 heating season as required by the November 15, 2017 letter by Mr. Walter Parish, P.E., of the New York State Department of Environmental Conservation (NYSDEC).

The sampling scope of work was based on the CTS Sampling Work Plan last revised December 18, 2017 and approved by the NYSDEC and NYSDOH on December 19, 2017. The scope of work performed at the subject property included the following as required by NYSDEC and NYSDOH: 1) Interior vacuum test points and VOC gas measurements; 2) Sub-Slab Depressurization System (SSDS) air sampling; 3) Indoor and outdoor ambient air sampling; 4) Exterior subsurface soil vapor gas sampling; 5) Installation of a new exterior subsurface soil vapor gas sampling point (PP-6); 6) Groundwater monitoring and sampling of four, 4-inch diameter wells; and 7) Cesspool liquid and sludge sampling. Specifically, extracted soil vapors were monitored to evaluate the effectiveness of the SSDS and to check for carbon vessel breakthrough. Monitoring included screening the influent and effluent air sampling ports with a photoionization detector (PID) and collecting influent and effluent samples using six-liter Summa® canisters with eight hour regulators. Sampling results are included in Appendix G of the FER.

On April 28, 2018, TetraSOLV Filtration replaced the granular activated carbon (GAC) associated with the SSDS. The exhausted GAC was properly recycled by TetraSOLV.

On May 3, 2018, CTS removed several one-gallon containers of dry cleaning spotting chemicals per NYSDEC and NYSDOH request. Chemical product names and quantities removed from the Site are listed on the completed "Indoor Air Quality Questionnaire and Building Inventory Form", Appendix XIII.

On May 18, 2018, a licensed electrician replaced the active RadonAway Fan (Model GP501) with a larger RadonAway RPc Series Fan (Model RP265c) which draws 334 cubic feet per minute (CFM) of air through the SSDS. Upon installation, CTS measured interior vacuum test points for differential pressure beneath the building slab. Field measurements are included in Appendix G of the FER.

A "Final Engineering Report", dated May 25, 2018, prepared by Cashin Technical Services, Inc.

A "Additional Sampling Report on the Groundwater, Soil Vapor, Indoor Air, and Cesspool", dated May 25, 2018, prepared by Cashin Technical Services, Inc.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated August 11, 2011, are as follows:

Groundwater RAOs

RAOs for Public Health Protection

- Prevent ingestion of groundwater contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Remove the source of ground or surface water contamination.

Soil RAOs

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.5 Remaining Contamination

2.5.1 Soil

In 1996, prior to entering into the Voluntary Cleanup Program, the affected contaminated area of PCE containing soil materials (parking lot area located on the west side of the subject building) was excavated and 67.76 tons of contaminated soil was removed and disposed of off-site at a permitted disposal facility.

Based on PW Grosser Excavation Endpoint Soil Sampling data presented in the "Continued Soil & Groundwater Investigation & Remedial Measure" report by PW Grosser dated December 1996, all seventeen (17) endpoint soil samples, labeled EP-1 through EP-17 were below NYSDEC TAGM #4046 Recommended Soil Cleanup Objective (RSCO) guidelines. Tables and figures summarizing the results of all soil samples collected as part of the remediation are included PW Grosser December 1996 Report.

2.5.2 Groundwater

In February 2000, four (4) groundwater monitoring wells were installed at the Site and according to Anson Environmental Ltd. (AEL), several groundwater samples events have occurred since that time. According to AEL's "Soil and Groundwater Investigation Work Plan dated July 28, 2003, elevated levels of tetrachloroethylene was found in MW-1, MW-3 and MW-4 in March 2000; MW-2, MW-3 and MW-4 in May 2000; and MW-1, MW-2, MW-3 and MW-4 in October 2002.

However, as a result of source removal, PCE levels in 2007 were found to have diminished significantly (ND to 6.4 ppb). In 2008, groundwater samples were collected at four on-site locations via a *Geoprobe* at 25' and 50' below grade. PCE was ND in all samples.

Tables and figures summarizing the results of all samples of groundwater that exceeded 6 NYCRR Part 703 and the "Division of Water Technical and Operational Guidance Series (1.1.1)" after completion of the remedial action are shown in the AEL and Walden Reports from July 2003 to December 2008.

2.5.3 Soil Vapor

As a result of this remedial action, the concentration of contaminants in groundwater has diminished; however, concentrations of TCE and PCE in subsurface soil vapor remain elevated as indicated in Table 2 (Vapor Gas Sampling Results) below. Additionally, the influent port on the SSD system measured elevated levels of TCE and PCE in sub-slab soil vapor gas as being above the NYSDOH air guidance values. Additionally, soil vapor gas samples collected outside the building revealed elevated levels of volatile organic compounds (VOCs).

CTS performed remediation performance baseline sampling of the SSD System and the permanent exterior soil vapor gas sampling points on November 7, 2014. This vapor gas sampling was performed at the following locations as outlined in the April 2011 Revised RAWP.

- Ambient Air ("AA-1") - Inside the subject building
- "Effluent Pipe" - Along the SSD System
- "Influent Pipe" - Along the SSD System
- "PPB-1" – Newly installed exterior sub-surface permanent soil gas sampling point
- "PP-2" – Exterior sub-surface permanent soil gas sampling point
- "PP-3" – Exterior sub-surface permanent soil gas sampling point
- "PP-4" – Exterior sub-surface permanent soil gas sampling point
- "PPB-5" – Newly installed exterior sub-surface permanent soil gas sampling point

The effectiveness of the SSD System was evaluated and confirmed that the RadonAway fan (Model GP 501) was properly installed to create negative pressure beneath the building's slab. The ability of the RadonAway fan to create negative pressure was determined by measuring the pressure at the interior extraction point and four interior sub-slab vacuum test points (TP's) utilizing a Magnehelic Differential Pressure Gauge. The interior vacuum test point measurements (differential pressure) collected by CTS (prior to sampling) is shown in Table 3 below.

Monitoring included screening the influent and effluent air sampling ports with a photoionization detector (PID) and collecting influent and effluent samples using six-liter Summa® canisters. Vapor gas sampling was also performed on the five exterior sampling points utilizing six-liter Summa® canisters. VOC gas measurements were recording utilizing a PID meter on all influent and effluent monitoring points. All system PID screening and gauge readings were recorded for subsequent reporting as outlined in this Site Management Plan (SMP).

CTS utilized six-liter Summa® canisters with two hour regulators to collect the vapor gas samples. The two hour regulators were laboratory calibrated so that they did not exceed 0.2 liters per minute of air flow to minimize ambient air infiltration during sampling.

All vapor gas samples were analyzed for target dry cleaning VOCs (PCE, TCE and their chemical breakdown products) via USEPA Method TO-15.

The results of the vapor gas sampling is summarized below in Table 2.

Table 2 – Vapor Gas Sampling Results

Samples Collected on November 7, 2014

Sample ID	VOC Compounds	Results ug/m3	NYSDOH Air Guideline Values ug/m3
AA-1	Trichloroethene (TCE)	**141**	2
	Tetrachloroethene (PCE)	9.02	30
	1,1,1-Trichloroethane (TCA)	U <1.09	100
	1,1,2-Trichloroethane (TCA)	U <1.09	N/A
	1,1-Dichloroethane (DCA)	U <0.81	N/A
	1,2-Dichloroethylene (DCE)	U <0.79	100
	Vinyl Chloride	U <0.51	5
Effluent	Trichloroethene	61.2	
	Tetrachloroethene	201	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	
Influent	Trichloroethene (TCE)	**150**	2
	Tetrachloroethene (PCE)	**465**	30

	1,1,1-Trichloroethane (TCA)	U <1.09	100
	1,1,2-Trichloroethane (TCA)	U <1.09	N/A
	1,1-Dichloroethane (DCA)	U <0.81	N/A
	1,2-Dichloroethylene (DCE)	U <0.81	100
	Vinyl Chloride	U <0.51	5
PPB-1	Trichloroethene (TCE)	17.5	
	Tetrachloroethene (PCE)	753	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	
PPB-5	Trichloroethene (TCE)	16.9	
	Tetrachloroethene (PCE)	108	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	
PP-2	Trichloroethene (TCE)	10.5	
	Tetrachloroethene (PCE)	19.4	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	
PP-3	Trichloroethene (TCE)	17.2	
	Tetrachloroethene (PCE)	1,330	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	
PP-4	Trichloroethene (TCE)	5.54	

	Tetrachloroethene (PCE)	648	
	1,1,1-Trichloroethane (TCA)	U <1.09	
	1,1,2-Trichloroethane (TCA)	U <1.09	
	1,1-Dichloroethane (DCA)	U <0.81	
	1,2-Dichloroethylene (DCE)	U <0.81	
	Vinyl Chloride	U <0.51	

NOTES

1. All results are expressed in micrograms per cubic meter of air (ug/m³).

2. U= Less than analytical detection limit.

3. **Bold** result values indicate those compounds which exceed the NYSDOH Guideline values published in the "NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)".

4. In September 2013 NYSDOH lowered their air guideline value for tetrachloroethene in ambient air from 100 micrograms per cubic meter (mcg/m3) to 30 mcg/m3 and in August 2015 NYSDOH lowered their guideline for trichloroethene in ambient air from 5 micrograms per cubic meter (mcg/m3) to 2 mcg/m3.

Locations of the sampling points are shown on Figure 2 – Site Sketch.

The measurements of the vacuum test points and VOC gas monitoring are presented below in Table 3.

Table 3 - Interior Vacuum Test Points and VOC Gas Measurements

Data Collected on November 7, 2014 by CTS

Interior Vacuum Test Points	Magnehelic Differential Pressure
TP-1	-0.4 psi
TP-2	-0.4 psi
TP-3	-0.3 psi
TP-4	-0.2 psi
Extraction Port	-3.0 psi

SSD System Ports	PID Readings
Influent Port	0.5 ppm
Extraction Port	0.0 ppm
Effluent Port	0.0 ppm

Notes: PPM = parts per million

PSI = pounds per square inch

Additional tables and figures summarizing soil vapor gas sampling after completion of the remedial action are shown in the Walden Reports from December 2008 to December 2012.

2.5.4 Additional Remedial Performance Sampling

At the request of NYSDE and NYSDOH, CTS performed additional sampling of the groundwater, soil vapor, indoor air and cesspool on December 27, 2017. The scope of work performed at the subject property included the following as required by NYSDEC and NYSDOH: 1) Interior vacuum test points and VOC gas measurements; 2) Sub-Slab Depressurization System (SSDS) air sampling; 3) Indoor and outdoor ambient air sampling; 4) Exterior subsurface soil vapor gas sampling; 5) Installation of a new exterior subsurface soil vapor gas sampling point (PP-6); 6) Groundwater monitoring and sampling of four, 4-inch diameter wells; and 7) Cesspool liquid and sludge sampling. Specifically, extracted soil vapors were monitored to evaluate the effectiveness of the SSDS and to check for carbon vessel breakthrough. Monitoring included screening the influent and effluent air sampling ports with a photoionization detector (PID) and collecting influent and effluent samples using six-liter Summa® canisters with eight hour regulators.

Sampling results are included in Appendix G of the FER

Due to no pressure differential in the four interior vacuum test point, the SSDS fan was replaced on May 18, 2018 to enhance the negative pressure beneath the building slab. Upon installation, CTS measured the interior vacuum test points for differential pressure beneath the building slab. Field measurements are also included in Appendix G of the FER.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the Site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

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

3.2 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor the Engineering Control system (SSD System); (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the Site to commercial use only. Adherence to these ICs on the Site is required by the Declaration of Covenants and Restrictions and will be implemented under this SMP. ICs identified in the Declaration of Covenants and Restrictions may not be discontinued without an

amendment to, or extinguishment of, the Declaration of Covenants and Restrictions. The IC boundaries are shown on Figure 7 – Survey Map with Metes and Bounds Description. These ICs are:

- Declaration of Covenants and Restrictions - Current and Future Use of the Site: Permitted future uses (commercial and industrial) must comply with 6 NYCRR 375-1.8(g)(2)(iii) for commercial uses; and 6 NYCRR 375-1.8(g)(2)(iv) for industrial uses;
- The property may be used for: commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health to render it safe for use as drinking water or for commercial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Declaration of Covenants and Restrictions;

- The potential for vapor intrusion must be evaluated for any buildings developed on the Site, specifically within the IC boundaries; and any potential impacts that are identified must be monitored or mitigated. The IC boundaires for this Site encompasses the entire subject lot as depicted on the survey map provided in Figure 7; and

- Vegetable gardens and farming on the Site are prohibited;

3.3 Engineering Controls

Since remaining soil vapor exists beneath the Site, Engineering Controls (EC) are required to protect human health and the environment. The Site has the following primary Engineering Controls, as described in the following subsections.

3.3.1 Sub-Slab Depressurization (SSD) System

The SSD System was developed in accordance with Section 4 of the NYSDOH "*Guidance for Evaluating Soil Vapor Intrusion in the State of New York*" (dated October, 2006). Walden personnel adhered to all technical specifications of the SSD System components. Technical specifications of the SSD System were outlined and included in the Revised RAWP (prepared by Walden) and approved by the NYSDEC. Copies of these SSD System technical specifications are included in the Operations and Maintenance Manual, Appendix IX and in Appendix XII – SSD System Manufacturing Product Information Sheets.

The SSD System was installed with the following components:

- A RadonAway fan (former Model GP501, newly installed Model RP265c) was installed to induce negative pressure to the sub-slab region beneath the one-story building. Technical specifications of the fan are included in Operation and Maintenance Manual, Appendix IX.

- The extraction point for PCE vapors was installed in the center of the building, beneath the building slab, to capture all vapors.

- Interconnecting piping consisting of three and four-inch diameter schedule 40 PVC was utilized to install the SSD System. Four-inch PVC piping was

installed from the sub-slab extraction point, extending to above the suspended ceiling, and then connected to the fan utilizing flexible couplings. The four-inch piping was then extended from the fan to the southern exterior wall. The piping then penetrates the wall whereby a reducer fitting extends three-inch PVC piping into a 55-gallon drum containing granular activated carbon (GAC). The GAC Vessel is located outside the building along the south side. The purpose of the GAC Vessel is to treat the effluent gas prior to discharge to the atmosphere through a three-inch exterior mounted stack pipe. Sampling/monitoring ports were installed on the extraction piping (influent side) and after the GAC vessel (effluent side) for monitoring vacuum, flow and contaminant concentrations.

An as-built layout of the SSD System including all of its components is shown on Figure 3.

The initial start-up of the SSD System occurred in September 2012 by Walden Environmental Engineering, PLLC.

Manufacturing documentation sheets and operation and maintenance manual sheets of the SSD System fan (RadonAway) and the carbon adsorption media filter unit (Tetrasolv Filtration) are provided in Appendix IX, Operation and Maintenance Manual.

Procedures for operating and maintaining the Sub Slab Depressurization system are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). Figure 3 (As-Built SSD System Schematic) shows the location of the EC for the Site.

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

3.3.1.1 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. Only after NYSDEC and NYSDOH have had an opportunity to evaluate the environmental data generated by this sampling plan, the volunteer (Mr. Thomas Ryan) may petition NYSDEC to modify the Plan. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of Site management for the Site are included in Cashin Technical Services, Inc. Quality Assurance Project Plan (QAPP) provided in Appendix VI.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and NYSDOH Guideline values published in "NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)" for vapor gas; and
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

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

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – wide Inspection

Site-wide inspections will be performed once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix VIII – Site Management Forms. The form will compile sufficient information to assess the following:

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

Inspections of all remedial components installed at the Site will be conducted. A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Declaration of Covenants and Restrictions.

- Achievement of remedial performance criteria; and
- If Site records are complete and up to date; and

Reporting requirements are outlined in Section 7.0 of this plan.

4.2.1 Indoor Air Quality Questionnaire and Building Inventory

Per the NYSDEC and NYSDOH request, a product inventory questionnaire (**"**Indoor Air Quality Questionnaire and Building Inventory" form from the NYSDOH 2006 Soil Vapor Intrusion Guidance document) will be completed to list what chemicals the operator of the facility is using and determine the source of elevated levels of TCE in indoor air. This building inventory questionnaire will be completed during the first Site visit/sampling event and will be included in the first PRR along with the preliminary sampling data. A blank copy of the questionnaire/building inventory form is included in Appendix XIII.

4.2.2 Emergency Inspections

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Treatment System Monitoring and Sampling

4.3.1 Remedial System Monitoring

Monitoring of the SSD System will be performed on a routine basis, as identified in Table 4 Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSD System has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSD System components to be monitored include, but are not limited to, the components included in Table 4 below.

Table 4 – Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
SSD System	Vacuum Blower Audio and Visual Blower Alarm General System Piping	334 CFM N/A N/A	Annually Daily/Annually Annually
Magnehelic Differential Pressure	Interior Vacuum Test Points	¨0.1 – ¨100 psi	Annually, at the time of Remedial System Sampling
SSD System Ports	PID Readings	0.0 – 100 ppm	Annually, at the time of Remedial System Sampling
Granular Activated Carbon Vessel	PID Readings	0.0 – 100 ppm	Annually, at the time of Remedial System Sampling

The filter media (activated carbon) inside the VFD-55 Tetrasolv Filtration 55-gallon drum vessel will be replaced (as necessary) and the spent (old) media would be properly disposed of or if possible, recycled. The filter media will be replaced when contaminant breakthrough is detected on the outlet vacuum/exhaust port of the activated carbon filter media vessel through the use of PID measurements during annual monitoring events.

Specifically, when VOC gas measurements meet or exceed the inlet side vacuum/air sampling port, filter media will be considered exhausted and will be scheduled for replacement by a licensed environmental contractor.

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix VIII - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.2 Remedial System Sampling

Samples shall be collected from the SSD System on an annual basis. Sampling locations, required analytical parameters and schedule are provided in Table 5 – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 5 – Remedial System Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOC's EPA method TO-15 8 hour regulator			
AA-1	X			Annually
Influent	X			Annually
Effluent	X			Annually

Detailed sample collection and analytical procedures and protocols are provided in Appendix V – Field Sampling Plan and Appendix VI – Quality Assurance Project Plan.

Sampling will continue on an annual basis until analytical results show that the Site has been effectively cleaned up to the satisfaction of the NYSDEC and it applicable cleanup objectives.

4.3.3 Soil Vapor Sampling

Soil vapor sampling will be performed on an annual basis to assess the performance of the remedy. Sampling locations, required analytical parameters and schedule are provided in Table 6 – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 6 – Soil Vapor Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOC's EPA method TO-15 8 hour regulator			
PPB-1	X			Annually
PP-2	X			Annually
PP-3	X			Annually
PP-4	X			Annually
PPB-5	X			Annually
PPB-6	X			Annually

An installation schematic of the permanent soil gas sampling point is shown on Figure 4 – Permanent Soil Gas Sampling Point Schematic

Detailed sample collection and analytical procedures and protocols are provided in Appendix V – Field Sampling Plan and Appendix VI – Quality Assurance Project Plan.

Sampling will continue on an annually until analytical results show that the Site has been effectively cleaned up to the satisfaction of the NYSDEC and it applicable cleanup objectives. Deliverables for the soil vapor sampling program are specified in Section 7.0 – Reporting Requirements.

Should levels of Volatile Organic Compounds (VOC's) detected in the exterior soil vapor samples show an increasing trend, and based on subsequent data review by the NYSDEC and the NYSDOH, additional measures to address potential source(s) of the contaminated soil vapor (i.e. Corrective Measures Plan) will be implemented.

4.3.4 Groundwater Sampling

Groundwater monitoring will be performed on an annual basis to assess the performance of the remedy and determine groundwater flow direction. Sampling locations, required analytical parameters and schedule are provided in Table 7 – Groundwater Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 7 – Groundwater Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOC's (EPA Method 8260)				
MW-1	X				Annually
MW-2	X				Annually
MW-3	X				Annually
MW-4	X				Annually

Purge water from the sampling of wells will be containerized in 55-gallon drums and staged on-site with properly labeling and decals. When full, these containerized 55-gallon drums will be properly disposed of off-site by a licensed environmental disposal contractor.

Table 8 below summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, one (1) up-gradient well, two (2) on-site wells and one (1) downgradient well are sampled to evaluate the effectiveness of the remedial system.

Table 8 – Monitoring Well Construction Details

Monitoring	Well	Coordinates (longitude/	Well Diameter	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
MW-1	Up-gradient	40°54'25.11"N 73°32'54.81"W	4	102.95	102.95		
MW-2	Westerly	40°54'25.50"N 73°32'55.06"W	4	101.57	101.57		
MW-3	Easterly	40°54'25.75"N 73°32'55.18"W	4	100.70	100.70		
MW-4	Down-gradient	40°54'25.68"N 73°32'54.78"W	4	101.95	101.95		

Monitoring well construction logs are included in AEL's "Soil and Groundwater Investigation Work Plan" dated July 28, 2003.

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

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

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the

NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the Site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

4.4 Post-Remediation Media Monitoring and Sampling

The SSD System will be shut down for a minimum of four (4) weeks prior to any post remedial monitoring and sampling. An ambient air sample from inside the subject building and an influent air sample from the interior sub-slab extraction point sampling port will be collected to ensure that the remedy was truly effective at cleaning up the PCE and TCE contamination at the Site. Sampling locations, required analytical parameters and schedule are provided in Table 9 – Post Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 9 – Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOC's EPA method TO-15 8 hour regulator			
AA-1	X			Four (4) weeks after SSD System shut down
Extraction Point	X			Four (4) weeks after SSD System shut down

Detailed sample collection and analytical procedures and protocols are provided in Appendix V – Field Sampling Plan and Appendix VI – Quality Assurance Project Plan.

If post remediation sampling does not meet the NYSDOH air guideline values, the SSD system will be turned back on until analytical results show that the Site is remediated to perform another round of post remediation sampling.

4.4.1 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix VIII - Site Management Forms Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan provided as Appendix V of this document.

4.5 Off-Site Residence Sampling Plan

Based on NYSDOH request and the detection of tetrachloroethene (PCE) in soil vapor location PPB-1 at a concentration of 290 micrograms per cubic meter (mcg/m3), off-site sampling needs to be performed to evaluate the adjacent residence to the south of the Site for potential exposures via a soil vapor intrusion study. Access will be acquired from the residential owner and sub-slab soil vapor; indoor air and outside (ambient) air samples will be collected during the 2018-2019 heating season. Sampling locations, required analytical

parameters and schedule are provided in Table 10 – Off-Site Residence Sampling Requirements and Schedule below.

Table 10 – Off-Site Residence Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOC's EPA method TO-15 24 hour regulator			
Southerly Adjacent Residence SSSV	X			During the 2018 – 2019 Heating Season
Southerly Adjacent Residence Indoor Air	X			During the 2018 – 2019 Heating Season
Southerly Adjacent Residence Outside Air	X			During the 2018 – 2019 Heating Season

Note: SSSV – sub-slab soil vapor (sampling port will be drilled through the center of the basement floor or slab on-grade foundation). Sampling of the southerly adjacent residence SSSV, indoor air, and outside air must be performed using a 24 hour regulator.

NYSDEC and NYSDOH will be notified five (5) days in advance of sampling. Laboratory analytical data will be sent via E-mail to NYSDEC and NYSDOH personnel for review. Should the laboratory analytical data indicate the potential for soil vapor intrusion to impact indoor air, appropriate actions will be implemented. Additional measures to address potential source(s) of the contaminated soil vapor (i.e. Corrective Measures Plan) will be implemented.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the SSD system;
- Will be updated periodically to reflect changes in Site conditions or the manner in which the SSD system is operated and maintained.

Further details regarding the Operation and Maintenance of the SSD system are provided in Appendix IX - Operation and Maintenance Manual. A copy of this Operation and Maintenance Manual, along with the complete SMP, is to be maintained at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Remedial System Performance Criteria

The minimum operating requirements for the installed SSD system component is as follows:

- RadonAway RP265c Series Radon Fan - Vacuum Blower @ 334 CFM

5.3 Operation and Maintenance of a Sub-slab Depressurization System

The following sections provide a description of the operations and maintenance of the SSD System. Cut-sheets and as-built drawings for the SSD System are provided in Appendix IX - Operation and Maintenance Manual and Appendix XII – SSD System Manufacturing Product Information Sheets.

5.3.1 System Start-Up and Testing

The system testing described above will be conducted if, in the course of the SSD system lifetime, the system goes down or significant changes are made to the system and the system must be restarted. Additionally, system testing will be conducted if there are any structural changes to the facility building or to its slab or foundation.

5.3.2 Routine System Operation and Maintenance

An annual inspection will be conducted by Bayville Village Cleaners, Inc.'s consultant to inspect the active SSD System and ensure that it is functioning properly. The SSD system will be inspected annually at the time of vapor gas sampling. The following items will be inspected and recorded as part of the routine systems operation and maintenance.

- The manometer reading will be checked to ensure that the fan is operating in the design range (extraction port).
- Interior vacuum test point readings will be measured to ensure sub-slab depressurization.
- The fan will be checked for unusual noise or vibration.
- The vent piping will be checked for damage.
- The pipe supports will be checked to ensure they are secure.
- The foundation sealing and sealing around system piping penetrations will be checked for any additional areas requiring sealing.
- Replace the filter media (activated carbon) inside the VFD-55 Tetrasolv Filtration 55-gallon drum vessel.
- Properly dispose of the spent filter media.

Additional information related to system components are found in Appendix IX - Operation and Maintenance Manual and Appendix XII – SSD System Manufacturing Product Information Sheets.

5.3.3 Non-Routine Operation and Maintenance

If the RadonAway fan or the RadonAway Checkpoint IIa system alarm fails or breaks during operation, replacement of these system components will be ordered and replaced immediately. If, during the sampling event, the interior vacuum test point readings do not show negative pressure, the fan may have to be upgraded to keep the building under negative pressure and ensure that sub-slab soil vapor gases are being drawn through the SSD System.

5.3.4 System Monitoring Devices and Alarms

- RadonAway Checkpoint IIa Radon System Alarm

The Radon Away fan is equipped with a pressure differential monitoring device (RadonAway Checkpoint IIa). This device is preset so no adjustment is needed and is designed to produce an audible alarm when pressure differential drops below the set point, thereby indicating loss of fan air/vapor flow. Factory settings are shown on the specification sheet included in Appendix IX – Operation and Maintenance Manual and Appendix XII – SSD System Manufacturing Product Information Sheets.

Should the power be lost to the building the fan will shut down and the alarm will initiate. Once power is restored to the building the alarm condition will be eliminated

The fan is powered by 120 volt circuits included in the lighting panels for the building. The fan should only be turned off for maintenance and service.

The SSD system has a warning devices to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SSD system will be restarted. Operational problems as well as any repairs to the system will be noted in the Periodic Review Report (PRR) for that reporting period.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or engineering controls to severe storms/weather events and associated flooding.

Flood Plain: The subject Site is located in a Special Flood Hazard Area subject to inundation by the 1% annual change of a flood. The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard includes Zone AE in which the subject Site is located in. The Base Flood Elevation (Elevation 9) is the water-surface elevation of the 1% annual chance flood. A copy of the Flood Plain Map is shown in Figure 5 – Flood Plain Map.

Power Outage: In the event of a power outage due to a severe weather events, the SSD System fan will shut down and the alarm will initiate. Once power is restored to the building the alarm condition will be eliminated. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period. If the power outage extends for a

period of more than five (5) days, power generators may be used to operate the SSD System.

Spill/Contaminant Release: The on-site septic system could be filled with stormwater and overflow in the event of flooding conditions. The use of spotting chemicals associated with the dry cleaning operations could spill in the event of flooding conditions and the 55-gallon drum of activated carbon associated with the SSD System could be damaged or spill in the event of flooding conditions.

Appropriate spill measures will be applied during these severe weather events. Any spills greater than 5-gallons will be reported to the NYSDEC Spill Hotline 1-800-457-7362.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the Site during Site management, and as reported in the Periodic Review Report (PRR).

No green remediation evaluations are being proposed at the time of this Site Management Plan; however, any green remedial technology implemented at the subject Site will be recorded in the PRR.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 Remedial Systems

Remedial systems will be operated properly considering the current Site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

- SSD System containing an activated carbon filter media vessel

  The filter media (activated carbon) inside the VFD-55 Tetrasolv Filtration 55-gallon drum vessel will be replaced (as necessary) and the spent (old) media would be properly disposed of or if possible, recycled. The filter media will be replaced when contaminant breakthrough is detected on the outlet vacuum/exhaust port of the activated carbon filter media vessel through the use of a PID measurements during annual monitoring events. Specifically, when VOC gas measurements meet or exceed the inlet side vacuum/air sampling port, filter media will be considered exhausted and will be scheduled for replacement by a licensed contractor.

6.2.3 Building Operations

The subject building will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation and water consumption.

6.2.4 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting

the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.2.5 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix VIII – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during Site management and to identify corresponding benefits; a set of metrics has been developed.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the Site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

A RSO document is not required at the present time; however, a table of contents is provided in Appendix X for reference purposes.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All Site management inspections, maintenance and monitoring events will be recorded on the appropriate Site management forms provided in Appendix VIII – Site Management Forms. These forms are subject to NYSDEC revisions.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 11 and summarized in the Periodic Review Report.

Table 11: Schedule of Interim Monitoring/Inspection Reports

Task/Report	**Reporting Frequency***
Inspection Report	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);

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

Routine maintenance event reporting forms will include, at a minimum:

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

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site described in Appendix IV – "The Declaration of Covenants and Restrictions". The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report; however, the laboratory analytical sampling reports will be sent (via E-Mail) to NYSDEC and NYSDOH in draft form while being reviewed by CTS. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site.

- Results of the required annual Site inspections and severe condition inspections, if applicable.

- All applicable Site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.

- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.

- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- The laboratory analytical sampling reports will be sent (via E-Mail) to NYSDEC and NYSDOH in draft form while being reviewed by CTS.

- A Site evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the Site-specific RAWP, ROD or Decision Document;

  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  - Any new conclusions or observations regarding the Site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  - Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.

  - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

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

- *The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control;*
- *Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the Site is compliant with the Declaration of Covenants and Restrictions;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program [and generally accepted engineering practices]; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Francis Cashin III P.E., of Cashin Technical Services, Inc. located at 1200 Veterans Memorial Highway, Hauppauge, New York 11788, am certifying as Remedial Party's Designated Site Representative that I been authorized and designated by the Site Remedial Party to sign this certification for the Site."

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

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

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

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3), the RSO report must be submitted to the Department for approval. A general outline for the RSO report is provided in Appendix X – Remedial System Optimization Table of Contents. The RSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual Site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10-"Technical Guidance for Site Investigation and Remediation", May 2010

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

A "Continued Soil & Groundwater Investigation & Remedial Measure" compiled by PW Grosser dated, December 1996.

A "Revised Site Investigation Work Plan" compiled by Walden Environmental Engineering, PLLC (Walden), dated May 17, 2007.

A "Site Investigation Report," compiled by Walden, dated December 9, 2008.

A "Site Investigation Report Addendum," compiled by Walden, dated September 16, 2009.

A "Remedial Action Work Plan," prepared by Walden, dated June 4, 2010.

A "Revised Remedial Action Work Plan", prepared by Walden, dated April 2011.

A "Field Sampling Plan", prepared by CTS, dated May 2017.

A "Quality Assurance Project Plan", prepared by CTS, dated May 2017.

A "Health and Safety Plan", prepared by CTS, dated May 2017, revised May 2018.

A "Sampling Work Plan", prepared by Cashin Technical Services, Inc. (CTS), dated December 18, 2017.

A "Sub-Slab Depressurization (SSD) System Operation and Maintenance Manual", prepared by CTS, dated May 2018.

A "Additional Sampling Report on the Groundwater, Soil Vapor, Indoor Air, and Cesspool", prepared by CTS, dated May 25, 2018.

A "Final Engineering Report", prepared by CTS, dated May 25, 2018.

FIGURES

FIGURE 1

SITE LOCATION PLAN

FIGURE 1

SITE LOCATION PLAN

Bayville Village Cleaners

290 Bayville Avenue

Bayville, New York

Cashin Associates, P.C.

ENGINEERING·PLANNING·CONSTRUCTION MANAGEMENT

13CTS.022

FIGURE 2

SITE SKETCH

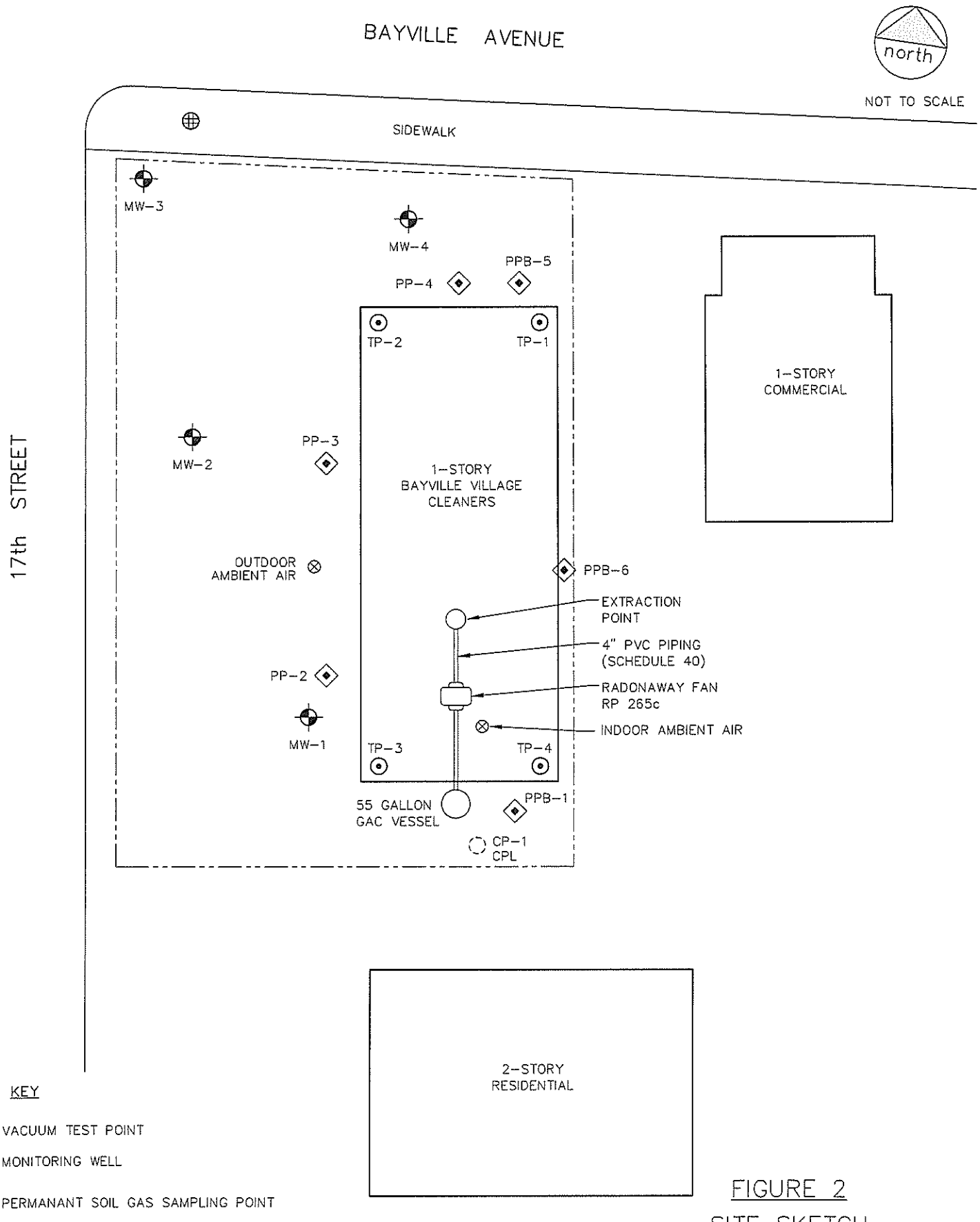


FIGURE 2

SITE SKETCH

Bayville Village Cleaners

290 Bayville Avenue

Bayville, New York

Cashin Associates, P.C.

ENGINEERING·PLANNING·CONSTRUCTION MANAGEMENT

13CTS.022 TASK 5

FIGURE 3

AS-BUILT SSD SYSTEM SCHEMATIC

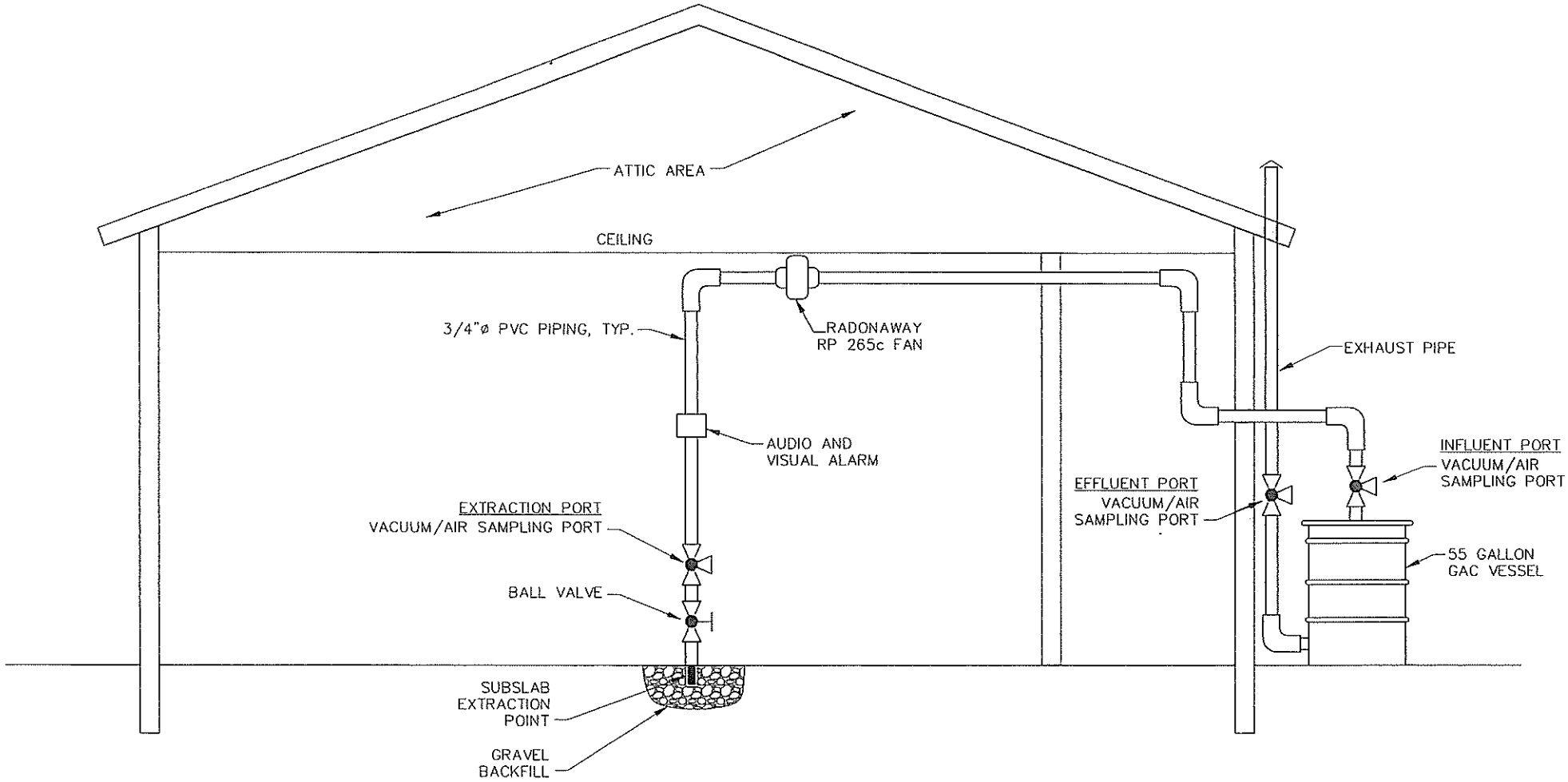


FIGURE 3

AS-BUILT
SSDS SCHEMATIC

Bayville Village Cleaners
290 Bayville Avenue
Bayville, New York

Cashin Associates, P.C.
ENGINEERING PLANNING CONSTRUCTION MANAGEMENT

13CTS.022 TASK 5

FIGURE 4

PERMANENT SOIL GAS SAMPLING POINT SCHEMATIC

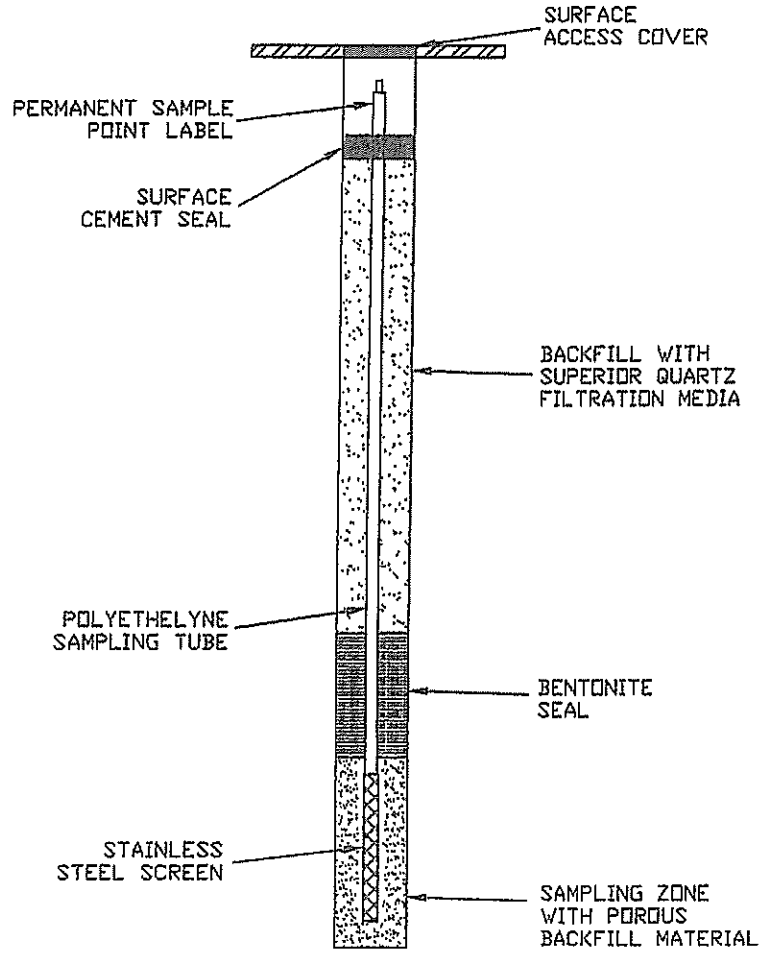


FIGURE 4

PERMANENT SOIL GAS
SAMPLING POINT

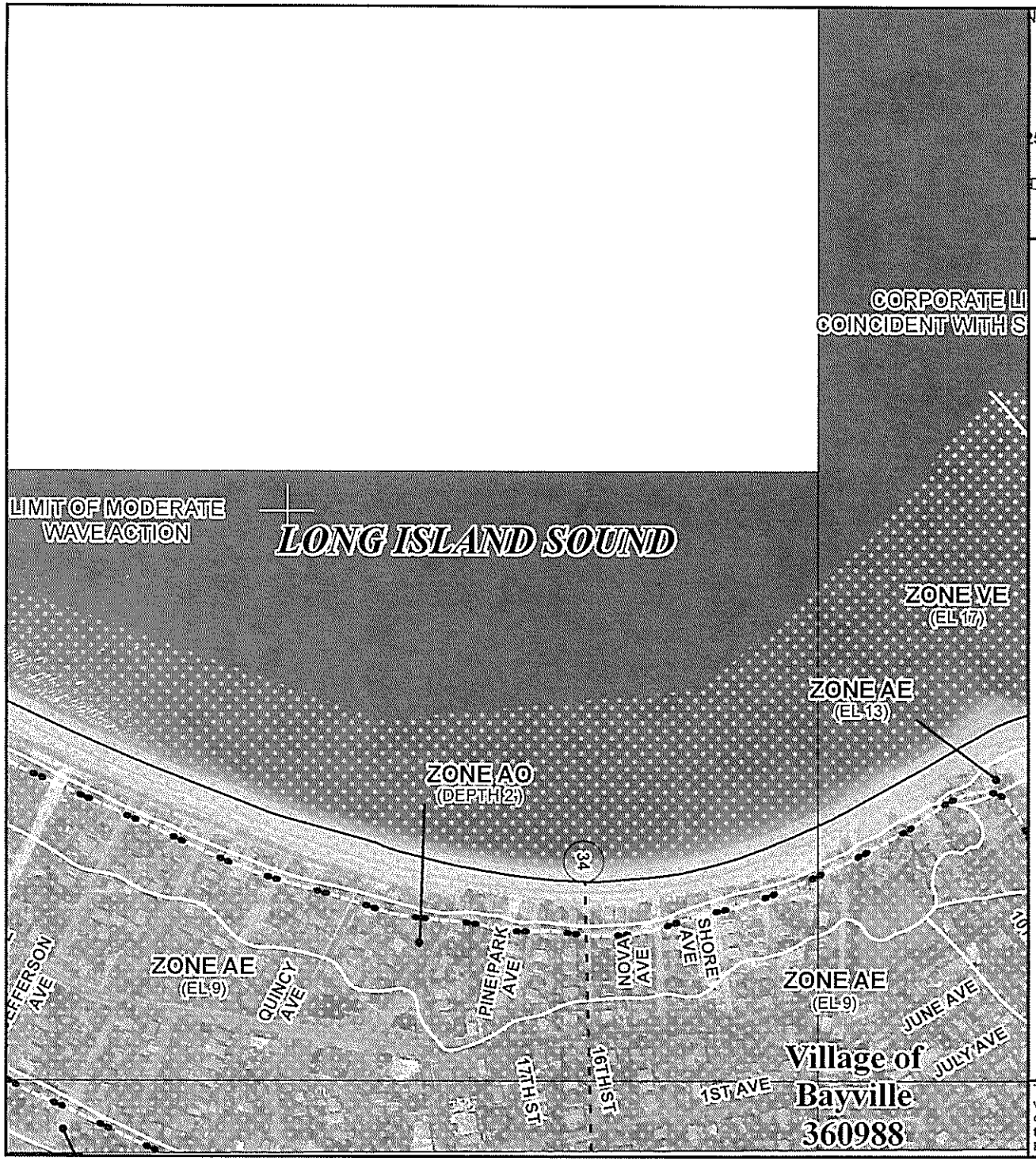
Bayville Village Cleaners
290 Bayville Avenue
Bayville, New York

Cashin Associates, P.C.
ENGINEERING PLANNING CONSTRUCTION MANAGEMENT

13CTS.022

FIGURE 5

FLOOD PLAIN MAP



National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0041G

FIRM

FLOOD INSURANCE RATE MAP

for NASSAU COUNTY, NEW YORK
(ALL JURISDICTIONS)

CONTAINS:

COMMUNITY	NUMBER
BAYVILLE, VILLAGE OF	360988
OYSTER BAY, TOWN OF	360483

NOTE
THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION

PANEL 41 OF 366
MAP SUFFIX: G
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Notice to User The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
36059C0041G

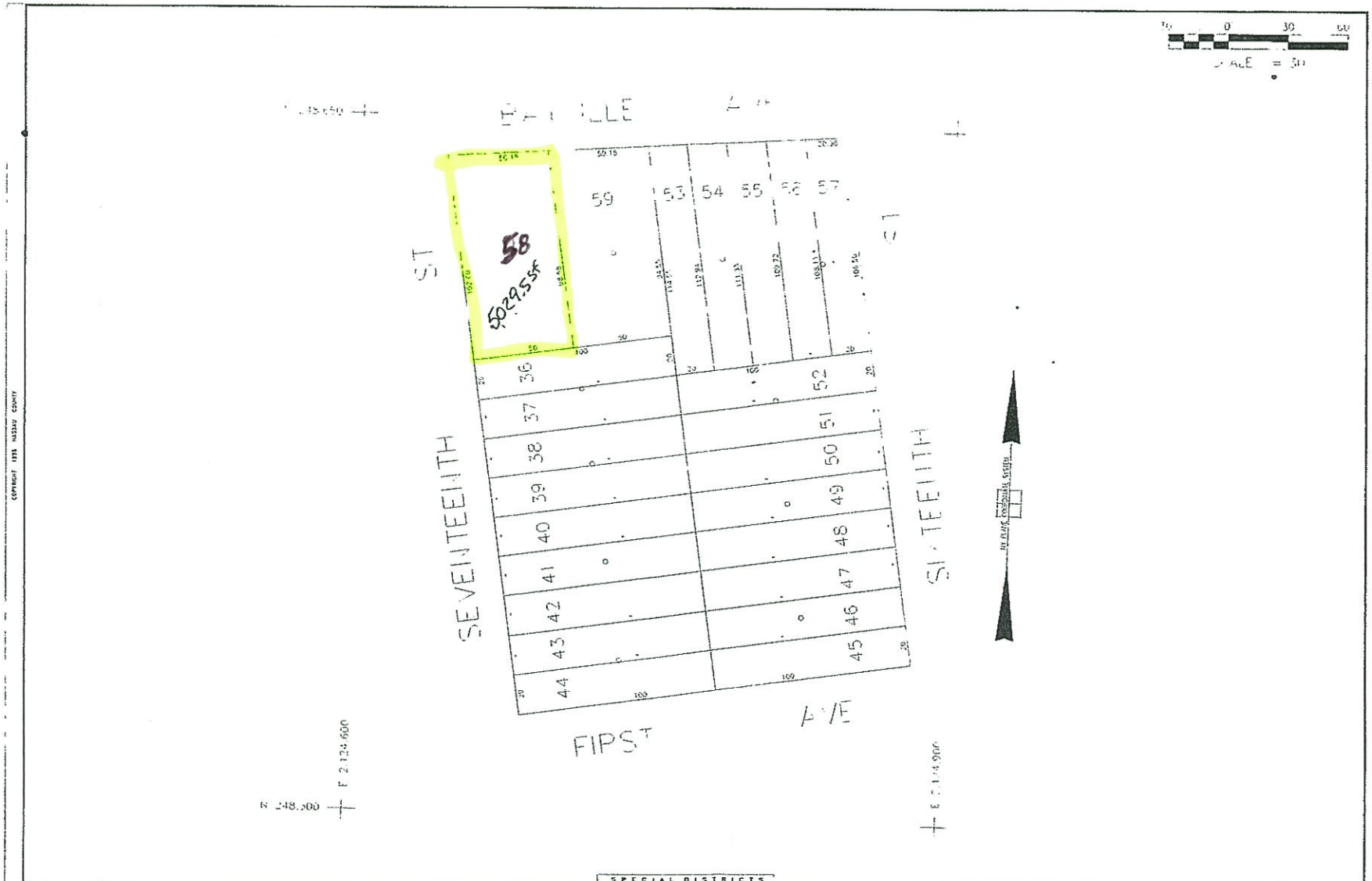
MAP REVISED
SEPTEMBER 11, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE 6

TAX MAP



LEGEND

COUNTY LINE
TOWN LINE
VILLAGE LINE
SCHOOL DISTRICT LINE
PROPERTY LINE
SPECIAL DISTRICT LINE
BLOCK LINE
LOCATOR POINT
TAX MAP PARCEL NO.
CALCULATED ACREAGE
DEED ACREAGE
SCALED DIMENSION
DEED DIMENSION
REFERENCE MAPS
MAP NO.

SPECIAL DISTRICTS

CODE	SPECIAL DISTRICT	DIST	WITHIN
300	POLICE		
	County Police	3	
	WATER		
	SANITARY		
	LIGHTING		
	LIBRARY		
	FIRE		
	FIRE PROTECTION		
	REFUSE & GARBAGE		
	REFUSE DISPOSAL		
	SEWAGE COLLECTION		
	PUBLIC PARKING		
	SEWER		
	PARK		
	IMPROVEMENT		
	SIDEWALK		
	DRAINAGE		
	FIRE HYDRANT RENTAL		
	GARBAGE		
	ESCALATOR		
	WATER POLLUTION CONTROL		
	Town, County, Library, Police #03	1	

MUNICIPALITIES

TOWN OF HEMPSTEAD
NORTH HEMPSTEAD
OYSTER BAY
CITY OF
GLEN COVE
LONG BEACH
VILLAGE OF
SCHOOL DISTRICT
Bayville 9

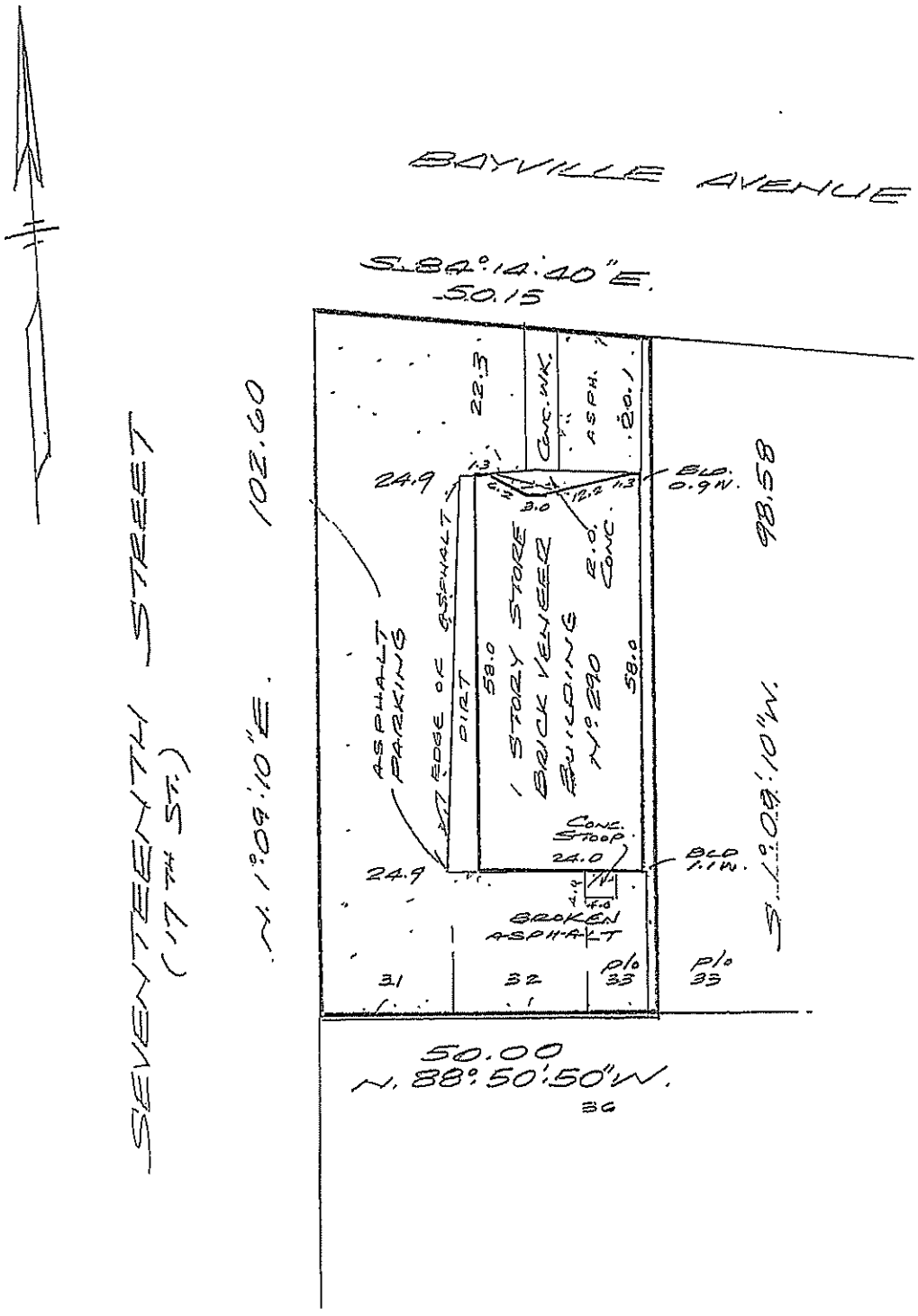
Nassau County
Department of Assessment
Charles O'Shea, Chairman
Land & Tax Map

Map Last Revised: January 31 2003

SEC. 28
BLK. 20
SHEET 1 OF 1

FIGURE 7

SURVEY MAP WITH METES AND BOUNDS DESCRIPTION



O'Connor - Petito, LLC
LAND SURVEYING - CIVIL ENGINEERING
27 FOREST AVENUE, LOCUST VALLEY, NY 11560
OCONNORPETITO@VERIZON.NET TEL: 516-676-3260 FAX: 516-676-1514

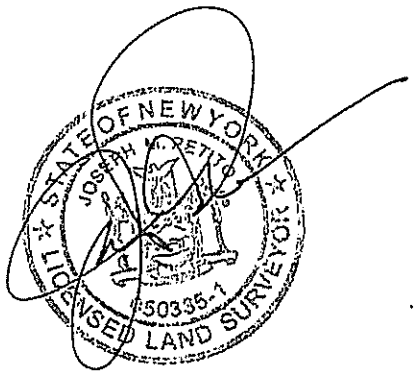
MAP	PINE ISLAND "MAP B"
SEC. 28 BLK. 20 LOT 58	SCALE 1"=20' DATE 4/19/16
LOCATION	BAYVILLE, NAS. CO., N.Y.
CERTIFIED	
REVISIONS	1. 2. 3.

STATE OF NEW YORK
JOSEPH M. PETITO
050335-1
LICENSED LAND SURVEYOR

DESCRIPTION
290 BAYVILLE AVENUE, BAYVILLE, NY
TAX SECTION 28 BLOCK 20 LOT 58

BEGINNING at the point of intersection between the southerly side of Bayville Avenue and the easterly side of Seventeenth Street (17th Street), proceed along the following four (4) courses and distances:

1. S 84° 14' 40"E. 50.15 feet;
2. S 1° 09' 10"W. 98.58 feet;
3. N 88° 50' 50"W. 50.00 feet;
4. N 1° 09' 10"E. 102.60 feet to the point of beginning.



4/19/16

PLEASE RETURN TO
TOM RYAN
19 TODD DR.
GLEN HEAD NY. 11545

APPENDICES

APPENDIX I – LIST OF SITE CONTACTS

Name	Contact Information
Thomas Ryan, Volunteer 19 Todd Drive Glen Head, New York 11545	(516) 317-3183 tomykins40@hotmail.com
Marc Califano – Environmental Scientist Cashin Technical Services, Inc. 1200 Veterans Memorial Highway Hauppauge, NY 11788	(631) 348-7600 x41 mcalifano@ca-pc.com
NYSDEC Division of Environmental Remediation Project Manager **Jahan Reza, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790	(631) 444-0242 jahan.reza@dec.ny.gov
NYSDEC Regional Hazardous Waste Remediation Engineer **Walter J. Parish, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790 and Kelly Lewandowski, P.E. Chief, Site Control Section NYSDEC – Albany Central Office	(631) 444-0241 walter.parish@dec.ny.gov (518) 402-9569

APPENDIX II – EXCAVATION WORK PLAN (EWP)

1.0 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify the NYSDEC. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix I.

Table 1: Notifications*

Name	Contact Information
NYSDEC Division of Environmental Remediation Project Manager **Jahan Reza, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790	(631) 444-0242 jahan.reza@dec.ny.gov
NYSDEC Regional Hazardous Waste Remediation Engineer **Walter J. Parish, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790 and Kelly Lewandowski, P.E. Chief, Site Control Section NYSDEC – Albany Central Office	(631) 444-0241 walter.parish@dec.ny.gov (518) 402-9569

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for Site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;

- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work;

- A summary of the applicable components of this EWP;

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;

- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix VII of this SMP;

- Identification of disposal facilities for potential waste streams; and

- Identification of sources of any anticipated backfill, along with all required chemical testing results.

2.0 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections 6 and 7 of this Appendix.

3.0 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC.

4.0 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

All excavated soils shall be sampled and analyzed in accordance with Table 5.4(e)10 in DER-10. Based on this characterization, soil containing contaminant levels which exceed the lower value of either the commercial use soil cleanup objectives (SCOs) or the protection of groundwater SCOs will be disposed of off-site at a permitted disposal facility selected with NYSDEC concurrence. Disposal manifests, for any soil disposed of off-site, will be included in the PRR prepared for the Site. Soil which meets the SCO's can be used as backfill and be returned into the excavations from which they were generated.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment

to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

5.0 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks loaded with Site materials will exit the vicinity of the Site using only approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

6.0 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this Site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic

Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

7.0 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Soil brought to the Site for use as cover or backfill must comply with 6 NYCRR 375-6.7(d) and DER-10 Section 5.4(e). The soil will be placed over a demarcation layer (preferably a geotextile fabric) to identify it from native soil. In areas where the soil is exposed, the upper 6 inches shall be of sufficient quality to maintain a vegetation layer.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

8.0 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with

applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the Site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

9.0 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the decision document. . The existing cover system is comprised of a concrete building, etc.]. The demarcation layer, consisting of [orange snow fencing material, white geotextile or equivalent material, etc.] will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

10.0 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the Site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet ‘exempt’ fill requirements under 6

NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

11.0 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

12.0 EXCAVATION CONTINGENCY PLAN

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

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

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

13.0 COMMUNITY AIR MONITORING PLAN

Air sampling stations will be determined in the field based on generally prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers. Additionally, any corrective or mitigative actions taken (i.e., dust suppression) will also be documented and reported to NYSDEC and NYSDOH Project Managers.

14.0 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-

site. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

15.0 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.

- Gravel will be used on roadways to provide a clean and dust-free road

surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

16.0 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX III RESPONSIBILITIES OF OWNER AND REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Bayville Village Cleaners, Inc. site (the "Site"), number V00220, are divided between the Site owner and a Remedial Party, as defined below. The owner is currently listed as:
FE-FA Corporation, c/o Zubair Khalid
160 West 97th Street, Apt. 10G
New York, New York 10025

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:
Thomas Ryan, Volunteer
19 Todd Drive
Glen Head, New York 11545

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the Site.

Site Owner's Responsibilities:

1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the Site.

2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in a Declaration of Covenants and Restrictions remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP

to include the certification in the Site's Periodic Review Report (PRR) certification to the NYSDEC.

3) In the event the Site is delisted, the owner remains bound by the Declaration of Covenants and Restrictions and shall submit, upon request by the NYSDEC, a written certification that the Declaration of Covenants and Restrictions is still in place and has been complied with.

4) The owner shall grant access to the Site, to the RP, and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the Site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3 -Notifications.

6) In the event some action or inaction by the owner adversely impacts the Site, the owner must notify the Site's RP and the NYSDEC in accordance with the time frame indicated in Section 1.3 - Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

7) The owner must notify the RP and the NYSDEC of any change in ownership of the Site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Site property. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) The RP remains ultimately responsible for maintaining the engineering controls.

9) Until such time as the NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.

10) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data, that is produced with respect to structures and that exceeds NYSDOH or OSHA guidelines on the Site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the Site.

2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing the Site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the Site visit and/or any final report produced.

4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).

5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and

monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

6) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 - Notifications of the SMP.

7) The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the Site, as required in Section 5 or Appendix IX (Operation and Maintenance Manual) of the SMP.

8) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.

9) Any change in use, change in ownership, change in Site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the Site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or Site ownership does not affect the RP's obligations with respect to the Site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future Site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX IV – DECLARATION OF COVENTANTS AND RESTRICTIONS

60 2017 00027084

Nassau County
Maureen OConnell
County Clerk
Mineola, NY 11501

Instrument Number: 2017- 00027084
As
D06 - AGREEMENT

Recorded On: March 17, 2017
Parties: BAYVILLE VILLAGE CLEANERS
TO TOWN OF OYSTER BAY
Recorded By: TOM RYAN

Billable Pages: 7
Num Of Pages: 8
Comment:

** Examined and Charged as Follows: **

D06 - AGREEMENT	85.00	Blocks - Deeds - $300	300.00
Recording Charge:	385.00		

Property Description:

Line	Section	Block	Lot	Unit	Town Name
1	28	20	58		OYSTER BAY

** THIS PAGE IS PART OF THE INSTRUMENT **

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

File Information:

Document Number: 2017- 00027084
Receipt Number: 584786
Recorded Date/Time: March 17, 2017 09:46:15A
Book-Vol/Pg: Bk-D VI-13484 Pg-664
Cashier / Station: 0 KAV / NCCL-CCR1FP2

Record and Return To:

TOM RYAN
19 TODD DR
GLEN HEAD NY 11545

NASSAU COUNTY STATE OF NEW YORK

Maureen O'Connell
County Clerk Maureen O'Connell

D06
8

CORRECTION DOCUMENT

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 16 day of MARCH 2017 by FE-FA Corporation, a corporation organized and existing under the laws of the State of New York with an office for the transaction of business at c/o Zubair Khalid, 160 West 97th Street, Apt. 10G, New York, New York 10025.

WHEREAS, Bayville Village Cleaners, (Site #V00220) is the subject of a Voluntary Cleanup Agreement executed by Bayville Village Cleaners, Inc. as part of the New York State Department of Environmental Conservation's (the "Department") Voluntary Cleanup Program, namely that parcel of real property located at the address of 290 Bayville Avenue in the Village of Bayville, Town of Oyster Bay, County of Nassau, State of New York, being the same as (or part of) that property conveyed to FE-FA Corporation by Bayville Village Cleaners, Inc. by deed(s) dated July 9, 2001 and recorded on July 19, 2001 in the Nassau County Clerk's Office in Liber Book D 11356 at Pages 682 to 685, and being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

SEC 28 BLK 20 LOT 58

WHEREAS, FE-FA Corporation is the current owner of the Property.

WHEREAS, in or about August 2011, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants (the "Remedy").

NOW, THEREFORE, FE-FA Corporation, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233

THIS DOCUMENT IS BEING RECORDED TO CORRECT INCORRECT METES & BOUNDS - RECEIPT# 524063
DOCUMENT NUMBER - 2017-00007277
BOOK-VOL 106 ?? - D ?? - 13445 PG 59

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii), which allows for Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv) without the express written waiver of such prohibition by the Department or Relevant Agency.

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

Sixth, the owner of the Property shall prohibit the use of the Property for agriculture or vegetable gardens.

Seventh, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Eighth, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Ninth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement executed by Bayville Village Cleaners, Inc. for Bayville Village Cleaners, Site No. V00220 requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Tenth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of

such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

FE-FA Corporation

By: Zubair Khalid

Print Name: ZUBAIR KHALID

Title: PRESIDENT Date: 3-16-17

Grantor's Acknowledgment

STATE OF NEW YORK)

) ss:

COUNTY OF)

On the 16 day of MARCH, in the year 2017, before me, the undersigned, personally appeared ZUBAIR KHALID, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public State of New York

Nicole R Leroux
Notary Public, State of New York
No. 01LE6224249
Qualified in Nassau County,
Commission Expires 6/28/2017

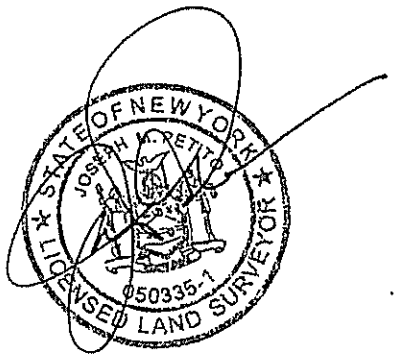
SCHEDULE "A"

Enter Property Description

DESCRIPTION
290 BAYVILLE AVENUE, BAYVILLE, NY
TAX SECTION 28 BLOCK 20 LOT 58

BEGINNING at the point of intersection between the southerly side of Bayville Avenue and the easterly side of Seventeenth Street (17th Street), proceed along the following four (4) courses and distances:

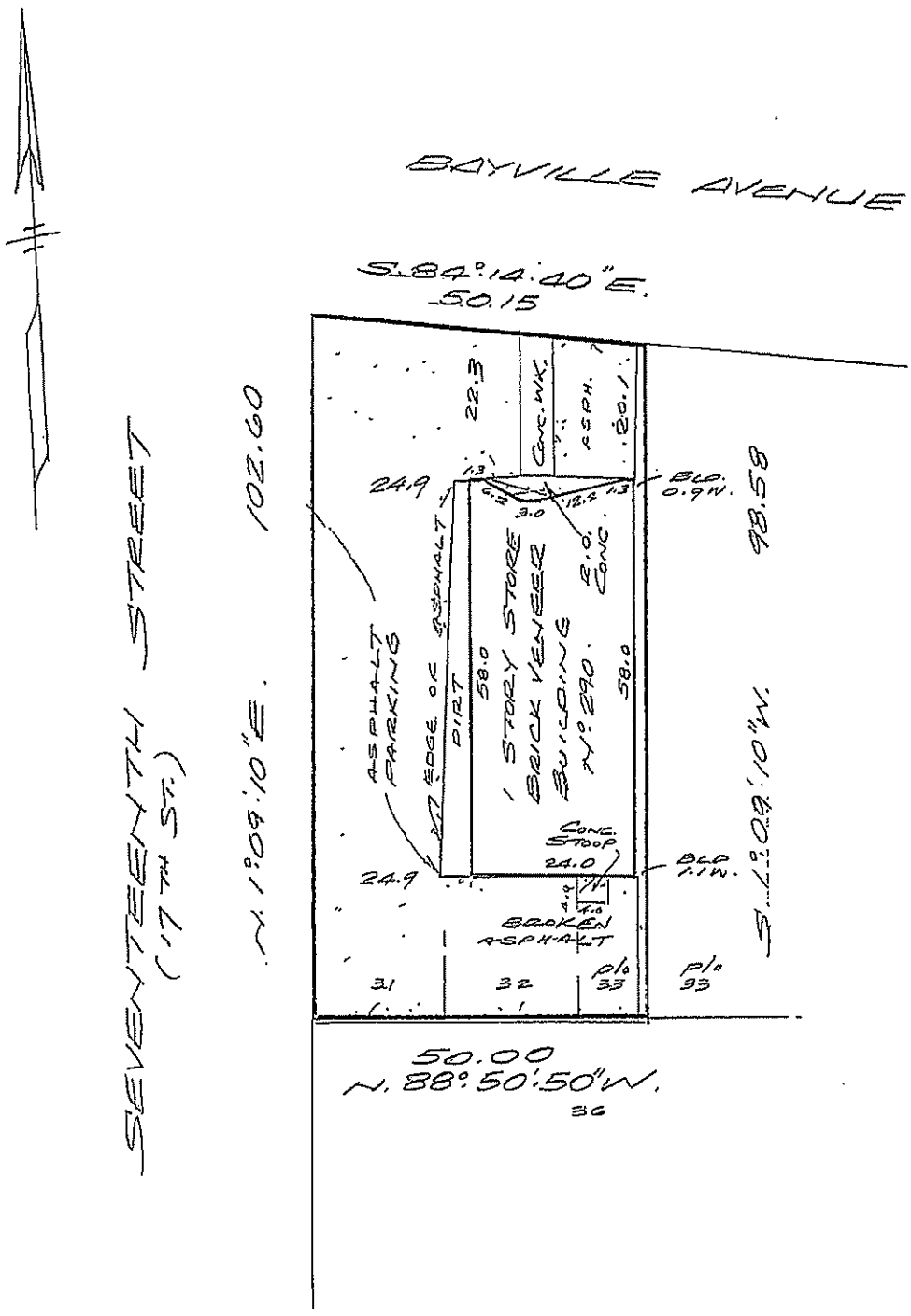
1. S 84° 14' 40"E. 50.15 feet;
2. S 1° 09' 10"W. 98.58 feet;
3. N 88° 50' 50"W. 50.00 feet;
4. N 1° 09' 10"E. 102.60 feet to the point of beginning.



4/19/16

PLEASE RETURN TO
TOM RYAN
19 TODD DR.
GLEN HEAD NY. 11545

SCHEDULE "B"



O'Connor - Petito, LLC
LAND SURVEYING - CIVIL ENGINEERING
27 FOREST AVENUE, LOCUST VALLEY, NY 11560
OCONNORPETITO@VERIZON.NET TEL: 516-676-3260 FAX: 516-676-1514

MAP	PINE ISLAND "MAP B"
SEC. 28 BLK. 20 LOT 58	SCALE 1"=20' DATE 4/19/16
LOCATION	BAYVILLE, NAS. CO., N.Y.
CERTIFIED	
REVISIONS	1. 2. 3.

STATE OF NEW YORK
JOSEPH V. PETITO
050335-1
LICENSED LAND SURVEYOR

APPENDIX V – FIELD SAMPLING PLAN

All sampling and analyses will be performed in accordance with the requirements of the Field Sampling Plan which was prepared by Cashin Technical Services, Inc. for the Site. A copy of CTS's FSP is attached to this appendix, Appendix V.

FIELD SAMPLING PLAN

for the property located at:

BAYVILLE VILLAGE CLEANERS
SITE NUMBER: V00220
290 BAYVILLE AVENUE
BAYVILLE, NASSAU COUNTY, NEW YORK 11709

prepared for:

Bayville Village Cleaners, Inc., Volunteer

Voluntary Cleanup Agreement: W1-0848-9903

prepared by:

CASHIN TECHNICAL SERVICES, INC.
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788
(631) 348-7600

MAY 2017

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FIGURES

FORMS

1.0 Purpose

1.1 Introduction

Cashin Technical Services, Inc. (CTS) has prepared this Field Sampling Plan (FSP) to address the Site Management Plan (SMP) for the Bayville Dry Cleaners site located 290 Bayville Avenue, Bayville, New York 11560. The project location is shown on Figure 1. Site sample locations are summarized on Figure 2. The FSP was prepared to provide the applicable procedures for collecting, transporting, and logging analytical samples during the implementation of the SMP.

A Quality Assurance Project Plan (QAPP) dated May 2017 has also been prepared and is included as an appendix of the SMP. The QAPP details the project data objectives and quality assurance/quality control (QA/QC) measures that will be implemented during the implementation of the FSP.

2.0 General Field Procedures

2.1 Utility Clearance Procedure

Underground utilities, including electric, telephone, cable television, cesspools, stormwater drywells, sewers, water, natural gas, etc., will be identified by owners/operators prior to any intrusive activity. The drilling contractor will place a call to the Long Island One Call Center (1-800-2724480) at least two, but not more than 10 days, prior to the commencement of work activities. The drilling contractor will make a note of ticket reference numbers and names of the utility operators that will be notified by the Long Island One Call Center. Public owned utilities will be located by responsible agencies at least 48 hours prior to field activities. Privately owned utilities will be marked out by a private mark out company to identify any subsurface utilities or obstructions prior to intrusive work activities. As a precaution, the first five (5) feet or one (1) foot below the nearest identified utility of the boring location will be pre-cleared utilizing hand tools.

The contractor will check that each notified utility company has either marked the work site or given an "all clear" prior to commencing work. Other potential on-site hazards such as known subsurface structures, overhead power lines, and building hazards will be identified during site reconnaissance visits.

2.2 Field Notebook Procedure

The field notebook is intended to serve as a record of significant field activities performed or observed during the project. The field notebook will serve as a factual basis for preparing field observation reports, if required, and reports to clients and regulatory agencies overseeing the project.

Procedure:

1. Use a separate all-weather bound notebook for each site/location/project number.

2. Write neatly using black or blue waterproof pen (or note if field conditions [i.e., cold or wet weather] require use of pencil).

3. Write the project name, project number, and book number (i.e., 1 of 3) on the front cover. On the inside cover, identify the project name, project number, and "Return Book To:" the office address of the Project Manager (PM).

4. Number all of the pages of the field book starting with the first entry.

5. Record activities as they occur.

6. Record the following information upon each arrival at the site:

    a. Date/time/weather/project number
    b. Consultant personnel
    c. Purpose of visit/daily objectives

7. Record conversations with:
    a. Contractors
    b. Clients
    c. Visitors (include complete names, titles, and affiliations whenever possible)
    d. Consultant office staff
    e. Landowners (site or abutters)
    f. Note time of arrival and departure of individuals visiting the site.

8. Examples of the field information to be recorded include time of occurrences.

    a. General site work activities
    b. Subcontractor progress
    c. Monitoring well sampling data
    d. Soil vapor well monitoring data

e. Ambient air monitoring data

f. Locations and descriptions of sampling points

g. Sample media (soil, sediment, groundwater, etc.)

h. Sample collection method

i. Number and volume of sample(s) collected and sample bottle preservatives used

j. Sample identification number (s) and date and time of sample collection

k. Approximate volume of groundwater removed before sampling

l. Field observations

m. Any field observations made such as pH, temperature, turbidity, conductivity, water level, etc.

2.3 Daily Activity Report Procedure

A daily activity report will be generated daily from the field database or field notebook to summarize the activities, observations, and decisions made during the day's fieldwork.

Procedure:

At the completion of the day's fieldwork, all pertinent field observations will be recorded in the site database, computer electronic form or on a hard copy paper form. If the electronic database is used, the database will generate the daily activity report that includes all samples collected and submitted to the laboratory for analysis. A daily activity report form is located in Appendix A. This report must be completed at the end of the workday. The daily activity report will be forwarded to the PM and site manager once completed. Field reports will be maintained at the site electronically and/or in hard copy form.

Contents of the report should include, at a minimum, the following information:

1. Date, project name, project number/phase/task, and site location.

2. A record of person(s) present at the site during the workday.

3. A brief description of the daily activities performed

4. A summary of any significant field observations to include:

    a. A summary of deviation(s) from the work plan or objectives.

    b. A summary of field decision(s) made, who made it/them, and the basis for such decision(s).

    c. Any recommendations that may result from field observations and any actions that resulted from those recommendations.

5. A summary of specific fieldwork completed

6. A summary of samples submitted for laboratory analysis.

2.4 Quality Assurance/Quality Control

There are no specific QA activities that apply to the implementation of these procedures. However, the following general QA procedures apply:

All data must be documented on field data sheets or within site logbooks.

All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented.

2.5 Sample Labeling Procedure

All samples collected will be labeled with the date and time the sample was collected, laboratory analysis requested, initials of the sampler(s), and the project number. Sample handling procedures are located in the QAPP.

All samples collected for analysis will be placed immediately into laboratory sample jars and properly stored in a cooler with ice to 4^0C before transport to the laboratory.

3.0 Groundwater Sampling Procedure

The following is a step-by-step sampling procedure to be used to collect groundwater samples from the monitoring wells. Well sampling procedures will be recorded in the field notebook. Sample management is detailed in the QAPP.

1. Groundwater samples will not be collected until at minimum, two weeks following well development of permanent wells.

2. Prior to sampling, a round of groundwater elevation measurements will be collected. The measurements will be made from the surveyed well elevation mark on the top of the inner PVC casing with a decontaminated electric water/product level probe. The measurements will be made in as short a time frame as practical to minimize temporal fluctuations in hydraulic conditions. The time, date, and measurement to nearest 0.01 foot will be recorded in the field logbook.

3. Place a plastic sheet on the ground to prevent contamination of the bailer rope and/or the tubing associated with the purging (pump) equipment.

4. Each monitoring well will be purged with a centrifugal, submersible, peristaltic, or whale pump and dedicated polyethylene tubing, or other methods at the discretion of the field geologist, and with the prior approval of NYSDEC.

5. Monitoring wells will be purged at a rate to minimize drawdown within the well to the extent practicable.

6. The water quality parameters of temperature, pH, conductivity, oxygen reduction potential, turbidity, and dissolved oxygen (DO) will be measured and recorded, at 3 to 5 minute intervals with a multi-parameter water quality probe. At least, one (1) well volume of water will be removed prior to sampling. When the parameters stabilize over three (3) consecutive readings, sampling may commence. Stability is achieved when pH is within 0.1 standard unit, temperature is within 0.5°C, pH is within 10% and specific conductivity is within 10% for three consecutive readings. Record results in the field logbook or sampling log form prior to sample collection.

7. Collect VOC samples with a dedicated polyethylene bailer lowered by a dedicated polypropylene rope or other methods as indicated. Other parameters may be collected with a submersible, or peristaltic pump using the low-flow sampling technique. The pump should be capable of throttling to a low flow rate suitable for sampling.

8. If the well goes dry before the required volumes are removed, the well may be sampled when it recovers sufficiently.

9. Purge water will be stored in temporary 5-gallon containers. PPE and dedicated disposable sampling equipment will be disposed of in garbage bags.

4.0. Soil Vapor and Indoor Air Sampling Procedure

4.1 Soil Vapor Sample Collection

This set of procedures outlines the general steps to collect soil vapor samples. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sample locations, sample depths, and sampling duration.

4.1.1 Soil Vapor Probe Installation

Permanent and temporary soil vapor probes will be installed using the procedure outlined below:

1. Record weather information (temperature, barometric pressure, rainfall, wind speed, and wind direction). Record substantial changes to these conditions that may occur during the course of the probe installation. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

2. Install soil vapor probes using a direct-push drill rig (e.g., GeoProbe or similar) or manually using a slide hammer. Probes will consist of stainless-steel drive points with stainless steel screens attached to food-grade (inert) Teflon or polyethylene tubing through which the soil vapor sample will be drawn.

3. Attach the drive points to a drive rod (stainless-steel tube) and drive the rod to the target depth, as define in the work plan.

4. Withdraw the drive rods from the hole, leaving the drive point and tubing.

5. Place filter pack material, such as glass beads or clean silica sand, in the annular space surrounding the tubing directly above the sample point to a height of approximately 1 to 2 feet. The depth of the filter pack material should always be

adequate to prevent the bentonite slurry above from going over the drive point and sample inlet screen.

6. Place bentonite slurry in the annulus above the filter pack material to provide a seal in the borehole. Ideally, place the bentonite annular seal at least 3 feet thick, although adjustments to this thickness may be required based on site-specific conditions. The entire borehole must be filled to the ground surface with either entirely bentonite or with natural fill between two bentonite seals (one above the filter pack material and one at the ground surface). Permanent installations must have a surface seal made of cement or cement/bentonite grout.

7. For permanent installations, install flush-mounted protective covers to protect the probe and the tubing.

8. Cut the end of the tubing to allow proper closure of the flush-mounted protective cover, but with a sufficient length of tubing exposed at the surface to facilitate connection of sampling equipment.

9. Close or cap the sample tubing following installation and following collection of each sample.

4.1.2 Collection of Soil Vapor Samples

Collecting soil vapor samples will be accomplished by using the following procedure:

1. Record weather information (i.e., temperature, barometric pressure, rainfall, wind speed, and wind direction) at the beginning of the sampling event. Also, record substantial changes to these conditions that may have occurred over the past 24 to 48 hours and that do occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

2. Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).

3. Identify sampling locations on a plot plan that also identifies buildings, other landmarks, and potential sources of VOC contamination to both the surface and outdoor air. Record the depth of the probe screen below grade.

4. If necessary, connect additional tubing to the tubing extending from the soil vapor probe to allow for connection to sample collection equipment.

5. Calculate the volume of air in the probe, tubing (volume = $\pi r^2 h$), including any additional tubing added in the step above and the annular space between the probe and the native material if sand or glass beads were used.

6. Connect a vacuum pump or gas-tight syringe (~60 cubic centimeters [cc]) to the sample tubing. At a flow rate of no more than 0.2 liter per minute (lpm), purge air from the tubing until one to three of the above-calculated air volumes are removed.

7. During purging, evaluate the potential for ambient air to be introduced in the soil vapor sample through the annulus of the soil vapor probe or tubing connections using a tracer gas such as helium. The procedures for the tracer gas evaluation are described below. Note that the bentonite used in the probe installation should have sufficient time to seal before the samples are collected. The tracer gas evaluation will verify if the seal is sufficient.

8. Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the soil vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre-calibrated by the laboratory for the desired flow rate or duration of sample collection, as identified in the project-specific work plan. The sampling flow rate should always be less than 0.2 lpm. The canisters will be batch certified as clean by the laboratory.

9. Remove the protective brass plug from the canister. Connect the pre-calibrated flow controller to the canister.

10. Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of-custody form for each sample.

11. Connect the tubing from the soil vapor probe to the flow controller.

12. Completely open the valve on the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.

13. Photograph the canister and the area surrounding the canister.

14. Monitor the vacuum pressure in the canister routinely during sampling.

15. Stop sample collection when the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

16. Record the final vacuum pressure and close the canister valve. Record the date and time that sample collection was stopped.

17. Remove the flow controller from the canister and replace the protective brass plug.

18. Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.

19. Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

20. Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.

21. Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.

22. Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

23. Provided that no additional sampling is expected to be conducted, either pull out (if practical) or abandon in place the sampling probe. When abandoning, cut the tubing back as far down as practical and cover to surface with native soil.

4.1.3 Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the soil vapor probe seal and assess the potential for introduction of ambient air into the soil vapor sample. A tracer gas evaluation should be conducted on all soil vapor probes. After the initial round of sampling and with the approval of the regulating agency, the use of tracer gas may be reduced to a minimum of 10 percent for permanent and semi-permanent probes if the initial round results showed installations with competent seals.

The following tracer gas evaluation procedure uses in-field tracer gas measurements and tracer gases (e.g., helium) that can be measured by portable detectors.

1. Retain the tracer gas around the sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.

2. Make sure the chamber is suitably sealed to the ground surface.

3. Introduce the tracer gas into the chamber. The chamber will have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. A

tracer gas detector will be attached to the valve fitting at the bottom of the chamber to verify the presence of the tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >50%.

4. The chamber will have a gas-tight fitting or sealable penetration to allow the soil vapor sample probe tubing to pass through and exit the chamber.

5. After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that will be pre-calibrated to extract soil vapor at a rate of no more than 0.2 lpm. Purge the tubing using the pump. Calculate the volume of air in the tubing and probe and purge one to three tubing/probe volumes prior measuring the tracer gas concentration.

6. Use the tracer gas detector to measure the tracer gas concentration in the pump exhaust.

7. Record the tracer gas concentrations in the chamber and in the soil vapor sample. If the evaluation indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the surface seal is not sufficient and requires improvement via repair or replacement prior to commencement of the sample collection. A non-detectable level of tracer gas is preferred; however. if the evaluation indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the soil vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

4.2 Sub-Slab Soil Vapor Collection

This set of procedures outlines the general steps to collect sub-slab vapor samples. The Work Plan should be consulted for proposed sample locations, sample depths, and sampling duration.

4.2.1 Sub-Slab Vapor Probe Installation

Temporary sampling probes will be installed using the following procedures:

1. Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).

2. If appropriate, record weather information (temperature, barometric pressure, rainfall, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may have occurred over the past 24 to 48 hours and that do occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

3. Identify sampling location(s) on a floor plan that also identifies any slab breeches (e.g., utility penetrations, sumps, drains, and cracks) and locations of HVAC equipment.

4. Insert a section of food-grade (inert) Teflon® or other appropriate tubing through a 3/8-inch (approx.) hole drilled through the slab. If necessary, advance the drill bit 2 to 3 inches into the sub-slab material to create an open cavity.

5. Install the tubing inlet to the specified sampling depth below the slab, not to exceed 2 inches.

6. Seal the annular space between the hole and tubing using 100% beeswax or another inert, non-shrinking sealing compound such as permagum.

4.2.2 Sub-Slab Vapor Sample Collection

Sub-slab vapor samples will be collected by following the steps outlined below.

Purge the tubing using a vacuum pump or gas-tight syringe (~60 cc). Calculate the volume of air in the tubing and purge one to three tubing volumes prior to sample collection at a rate no greater than 0.2 liter per minute (lpm).

1. Use an evacuated Summa® passivated (or equivalent) canister to collect the sub-slab vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre-calibrated by the laboratory for the desired flow rate or duration of sample collection, as defined in the site-specific work plan. The sampling flow rate should always be less than 0.2 lpm. The canisters will be batch certified as clean by the laboratory.

2. Remove the protective brass plug from canister. Connect the pre-calibrated flow controller to the canister.

3. Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of-custody form for each sample.

4. Connect the tubing from the sub-slab vapor sampling probe to the flow controller. Completely open the valve on the canister. Record the time that the valve is opened (beginning of sampling) and the canister pressure on the vacuum gauge.

5. Photograph the canister and the area surrounding the canister.

6. Monitor the vacuum pressure in the canister routinely during sampling, when practical (sometimes the canister will sample over a 24-hour period and routine monitoring is not practical).

7. Complete the NYSDOH building survey and chemical survey form.

8. Stop sample collection after the scheduled duration of sample collected, but when the canister still has a minimum amount of vacuum remaining. Check with the

laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

9. Record the final vacuum pressure and close the canister valve. Record the date and time that sample collection was stopped.

10. Remove the flow controller from the canister and replace the protective brass plug.

11. Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.

12. Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

13. Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.

14. Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.

15. Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

16. For temporary probes, remove the probe and seal the slab hole with cement. Repair flooring, if any.

4.2.3 Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the soil vapor probe seal and assess the potential for introduction of ambient air into the soil vapor sample. A tracer gas evaluation should be conducted on all soil vapor probes. After the initial round of

sampling and with the approval of the regulating agency, the use of tracer gas may be reduced to a minimum of 10 percent for permanent and semi-permanent probes if the initial round results showed installations with competent seals.

The following tracer gas evaluation procedure uses in-field tracer gas measurements and tracer gases (e.g., helium) that can be measured by portable detectors.

1. Retain the tracer gas around the sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.

2. Make sure the chamber is suitably sealed to the ground surface.

3. Introduce the tracer gas into the chamber. The chamber will have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. A tracer gas detector will be attached to the valve fitting at the bottom of the chamber to verify the presence of the tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >50%.

4. The chamber will have a gas-tight fitting or sealable penetration to allow the soil vapor sample probe tubing to pass through and exit the chamber.

5. After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that will be pre-calibrated to extract soil vapor at a rate of no more than 0.2 lpm. Purge the tubing using the pump. Calculate the volume of air in the tubing and probe and purge one to three tubing/probe volumes prior measuring the tracer gas concentration.

6. Use the tracer gas detector to measure the tracer gas concentration in the pump exhaust.

7. Record the tracer gas concentrations in the chamber and in the soil vapor sample. If the evaluation indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the surface seal is not sufficient and requires improvement via repair or replacement prior to commencement of the

sample collection. A non-detectable level of tracer gas is preferred; however, if the evaluation indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the soil vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

4.3 Indoor Air Sample Collection

This set of procedures outlines the general steps to collect indoor air samples. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sampling locations and other indoor air requirements (inventory, etc.).

Indoor air samples will be collected by following the steps outlined below:

1. Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).

2. Record weather information (temperature, barometric pressure, relative humidity, wind speed, and wind direction) and indoor temperature and humidity at the beginning of the sampling event. Record substantial changes to these conditions that may have occurred over the past 24 to 48 hours and that do occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

3. Identify sampling location(s) on a floor plan that also identifies locations of HVAC equipment, chemical storage areas, garages, doorways, stairways. sumps. drains, utility perforations, north direction, and separate footing sections

4. Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the outdoor air sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre-calibrated by the laboratory for the desired flow rate

or duration of sample collection, as defined in the site-specific work plan. The sampling flow rate should always be less than 0.2 lpm. The canisters will be individually certified as clean by the laboratory.

5. Place the canister at the sampling location. The sample should be collected from breathing height (e.g., 3 to 5 feet above ground). Either mount the canister on a stable platform or attach a length of inert tubing to the flow controller inlet and support it such that the sample inlet will be at the proper height.

6. Remove the protective brass plug from canister. Connect the pre-calibrated flow controller to the canister.

7. Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of custody form for each sample.

8. Completely open the valve on the vacuum pressure in the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.

9. Photograph the canister and the area surrounding the canister.

10. Monitor the vacuum pressure in the canister routinely during sampling, when practical (sometimes the canister will sample over a 24-hour period and routine monitoring is not practical). During monitoring, note the vacuum pressure on the gauge.

11. Complete the NYSDOH building survey and chemical survey form.

12. Stop sample collection after the scheduled duration of sample collection, but make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but

not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

13. Record the final vacuum pressure and close the canister valves. Record the date and time that sample collection was stopped.

14. Remove the flow controller from the canister and replace the protective brass plug.

15. Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.

16. Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

17. Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and *flow* controller, and the initial and final canister pressures on the vacuum gauge.

18. Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.

19. Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

4.4 Ambient Air Sample Collection

This set of procedures outlines the general steps to collect ambient air samples. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sample locations and sampling duration.

The following procedures will be followed for the collection of ambient air samples:

1. Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).

2. Select a location upwind of the building or other area that is being evaluated. If possible. select a location upwind or near the HVAC air intake for the building being sampled.

3. Record weather information (i.e., temperature, barometric pressure, relative humidity, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

4. Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the ambient air sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre-calibrated by the laboratory for the desired *flow* rate or duration of sample collection, as defined in the site-specific work plan. The sampling *flow* rate should always be less than 0.2 lpm. The canisters will be individually certified as clean by the laboratory.

5. Place the canister at the sampling location. If the sample should be collected from breathing height (e.g., 3 to 5 feet above ground), then mount the canister on a stable platform such that the sample inlet will be at the proper height.

6. Remove the protective brass plug from canister. Connect the pre-calibrated flow controller to the canister.

7. Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of custody form for each sample.

8. Completely open the valve on the vacuum pressure in the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.

9. Photograph the canister and the area surrounding the canister.

10. Document on a field form an outdoor plot sketch that indicates the building being sampled, streets, sampling location, location of potential outdoor air sources, north direction and paved areas. Also record pertinent observations such as odors, readings from field instrumentation. and significant activities in the vicinity that result in air emissions.

11. Monitor the vacuum pressure in the canister routinely during sampling, when practical (sometimes the canister will sample over a 24-hour period and routine monitoring is not practical). During monitoring, note the vacuum pressure on the gauge.

12. Stop sample collection after the scheduled duration of sample collection but make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

13. Record the final vacuum pressure and close the canister valves. Record the date and time that sample collection was stopped.

14. Remove the flow controller from the canister and replace the protective brass plug.

15. Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.

16. Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

17. Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.

18. Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.

19. Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

References

1. *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York,* New York State Department of Health, October 2006.

4.5 *Quality Assurance/Quality Control*

QA/QC procedures that apply to the these activities include QA/QC laboratory samples including blind duplicate, MS/MSD samples, and field blank samples. QA/QC samples are detailed in the QAPP. Prior to collection of the QA/QC samples, equipment will be decontaminated in accordance with procedures described in Section 5.

The following general QA procedures apply:

All data must be documented on field data sheets or within site field notebooks. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented as indicated in the QAPP.

5.0. Equipment Decontamination Procedure

The following equipment decontamination procedure is applicable for use in decontaminating sampling tools used in collection of analytical samples from surface soils, subsurface soils, and groundwater. Equipment decontamination will prevent cross contamination and maintain analytical sample integrity. This procedure may be varied or changed as required, dependent upon site conditions and equipment limitations. Any deviation from this standard should be documented in the field-sampling book and in the final report.

5.1 Equipment/Apparatus

Equipment needed for decontamination of sampling equipment may include:

- Alconox or non-phosphate soap
- Simple Green
- Methanol
- 10% Nitric acid solution
- De-ionized water
- Decontamination buckets
- Secondary containment vessels
- Plastic sheeting
- Scrub brushes
- PPE

5.2 Equipment Decontamination Procedure

Equipment will be decontaminated in accordance with procedures specified in the Work Plan as summarized below. Equipment decontamination procedures are also detailed within the QAPP.

5.2.1 Sampling Equipment and Tools

Prior to sampling, all non-dedicated equipment (i.e., bowls, spoons, bailers, and soil sampling apparatus (i.e. Macro-Core Shoe and split spoon equipment) will be decontaminated as follows.

Decontamination of sampling equipment and hand tools may take place at the sampling location as long as all liquids are contained in pails, buckets, etc.

All sampling equipment will be washed with water and a non-phosphate detergent (Alconox, Simple Green, etc.) to remove gross contamination.

All sampling equipment will then be rinsed with de-ionized water.

All equipment used to collect samples for VOC and semi-volatile organic compounds (SVOC) analysis will then receive a methanol rinse followed by a de-ionized water rinse.

All equipment used to collect samples for metals analysis will then receive a 10% nitric acid solution rinse followed by a de-ionized water rinse.

At no time will decontaminated equipment be placed directly on the ground. Equipment will be wrapped in polyethylene plastic or aluminum foil for storage or transportation from the designated decontamination area to the sampling location, where appropriate.

5.3 Quality Assurance/Quality Control

There are no specific QA activities that apply to the implementation of these procedures. However, the following general QA procedures apply:

All data must be documented on field data sheets or within site field notebooks. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented.

5.4 Analytical Sample Handling and Transport

Groundwater samples collected will be handled and submitted for laboratory analysis according to the following procedure. The QAPP provides a detail description of sample handling and transport.

1. Samples will be transferred from the sample equipment into suitable, labeled sample containers specific for the laboratory analyses to be performed. Use laboratory provided, pre-preserved sample bottles for specific analyses. Do not overfill bottles if they are pre-preserved.

2. Secure the sample container with the appropriate cap, place the sample container in a re-sealable plastic bag or bubble wrap, and place it inside of a sample cooler provided by the laboratory. Use ice to cool the sample cooler to 4 degrees Celsius.

3. Record all pertinent sample identification data in the site database and/or field notebook.

4. Print the completed COC record from the database, sign, and photocopy. If necessary, a hard copy COC may be used in the place of the electronic database. A COC is attached in Appendix D. Place the original COC in a re-sealable plastic bag and affix it to the inside of the top of the cooler/or will transmitted to the laboratory courier upon a sample pick-up.

5. Attach a custody seal to the outside of the cooler prior to shipment/pickup.

6.0 Investigation-Derived Waste Handling Procedure

6.1 General Waste Handling Procedures

The following procedure provides guidelines for the management of investigation derived wastes. Wastes anticipated to be generated as part of the SSD remedial system include the following materials: carbon adsorption media filter unit (Tetrasolv Filtration), groundwater, decontamination fluids. PPE, and miscellaneous investigation-derived field supplies. All wastes will be segregated into sediment and subsurface soil, fluids and PPE/miscellaneous investigation-derived materials. Investigation derived wastes will be placed in a United States Department of Transportation (USDOT)-approved 55-gallon drum, roll-off or tank. Each waste vessel will labeled with a "Non-Hazardous Waste Label" designated with "Pending Characterization."

Information on the label should include:

Generator: Bayville Village Cleaners

Address: 290 Bayville Avenue, Bayville, New York 11560

At the end of each day, each waste container should be secured, covered, and sealed at the end of waste handling activities. The field representative will document the number and type of investigation derived wastes.

6.2 Investigation Derived Waste Sample Collection Procedure

If required, the field representative will obtain a waste profile sample of soil and fluid investigation derived wastes. A sample will be collected from each of the investigation - derived wastes that require analysis for disposal. Soil wastes will be collected by using shovels, hand auger or other equipment, composited and then placed into laboratory provided sample jars. The waste profile parameters will be provided to the field representative prior to collection of the waste profile sample. Samples will be collected into laboratory-preserved bottles, chilled with ice, and submitted to the laboratory under COC as described in Section 5.4

FIGURE 1

SITE LOCATION PLAN

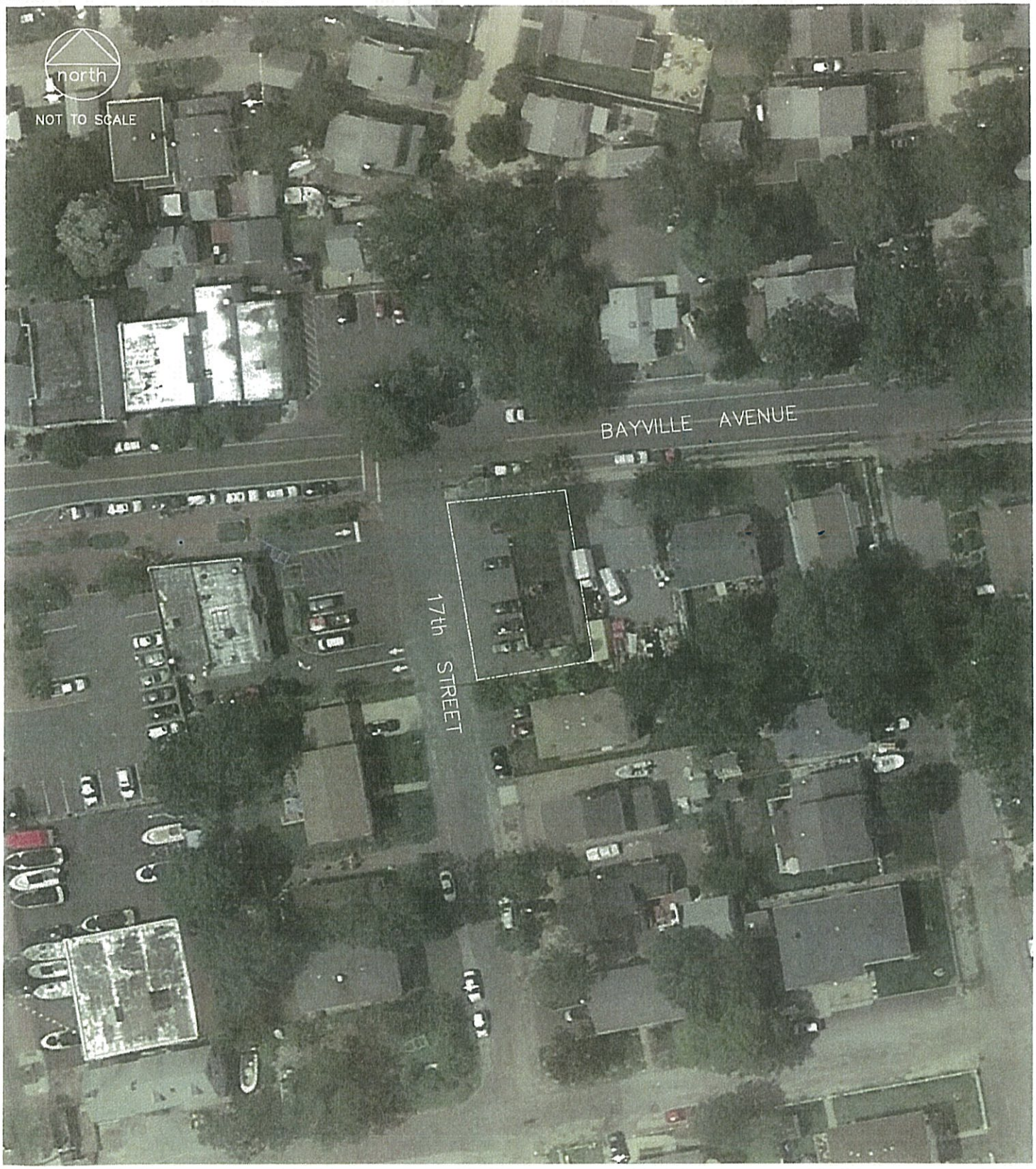


FIGURE 1

SITE LOCATION PLAN

Bayville Village Cleaners

290 Bayville Avenue

Bayville, New York

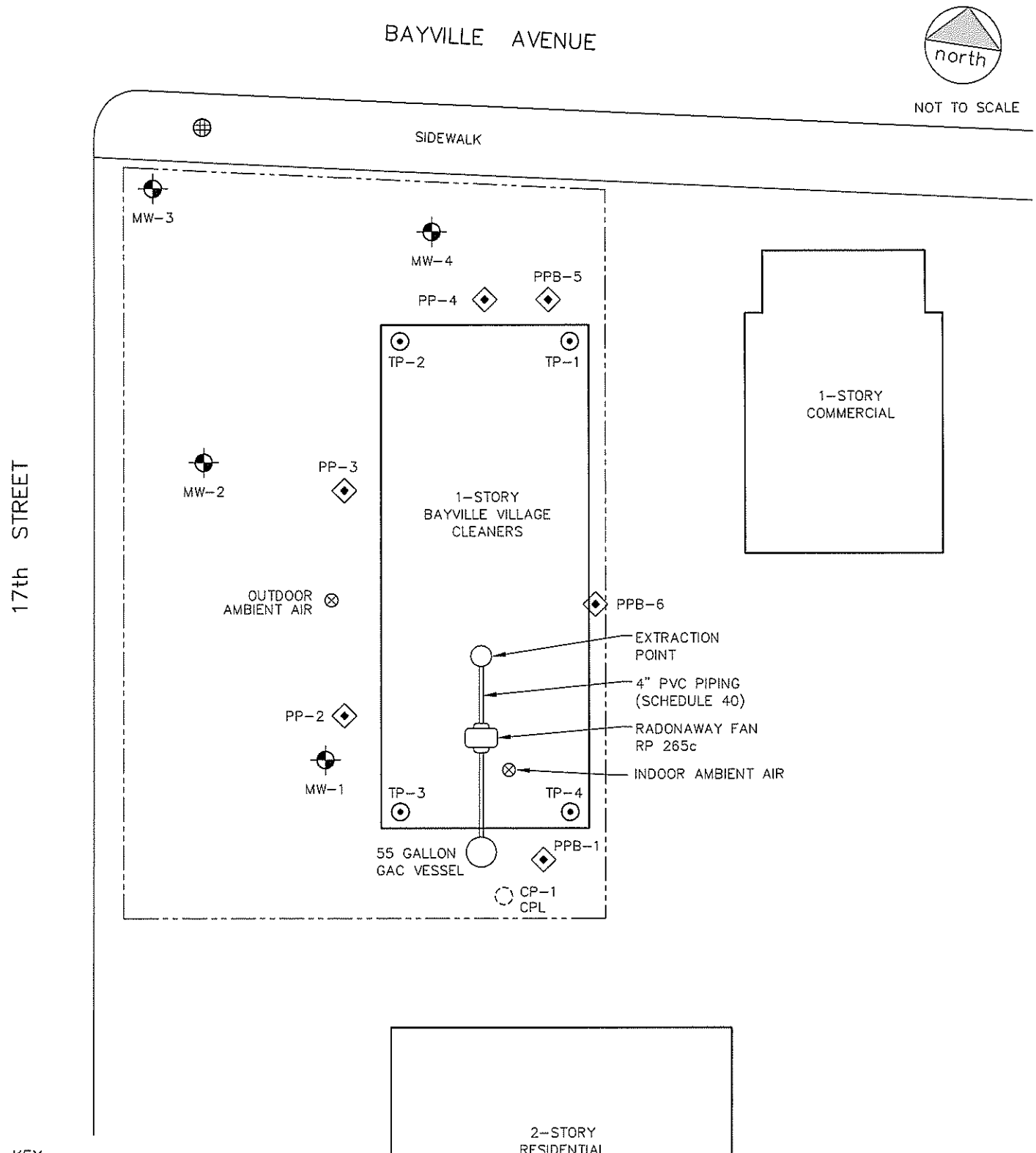
Cashin Associates, P.C.

ENGINEERING·PLANNING·CONSTRUCTION MANAGEMENT

13CTS.022

FIGURE 2

SITE SAMPLE LOCATION PLAN



KEY

- VACUUM TEST POINT
- MONITORING WELL
- PERMANANT SOIL GAS SAMPLING POINT
- STORM DRAIN
- CESSPOOL
- AMBIENT AIR SAMPLING POINT

FIGURE 2

SITE SKETCH

Bayville Village Cleaners

290 Bayville Avenue

Bayville, New York

Cashin Associates, P.C.

ENGINEERING·PLANNING·CONSTRUCTION MANAGEMENT

13CTS.022 TASK 5

FORMS

Groundwater Sampling Log

York Analytical Chain-Of-Custody – Air and Groundwater

GROUNDWATER SAMPLING LOG

SITE NAME:	SITE LOCATION:
DATE:	SAMPLERS:

PURGING & WATER QUALITY DATA

Well #	Sample Time	DTW	DTB	DO (mg/L)	pH	TEMP (C)	ORP	COND (ms/cm)

WELL CAP.(gal/ft): 0.75"=0.02; 1"=0.04; 1.25"=0.06; 2"=0.16; 3"=0.37; 4"=0.65; 5"=1.02; 6"=1.47; 12"=5.88
1 WELL VOLUME (gal) = (DTB – DTW) X WELL CAPACITY

ANALYSIS & METHOD:

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record - AIR

NOTE: York's Std. Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No.____________

YOUR Information
Company:
Address:
Phone No.
Contact Person:
E-Mail Address:

Report To:
Company:
Address:
Phone No.
Attention:
E-Mail Address:

Invoice To:
Company:
Address:
Phone No.
Attention:
E-Mail Address:

YOUR Project ID

Purchase Order No.

Samples from: CT___ NY___ NJ___

Turn-Around Time
- RUSH - Same Day ☐
- RUSH - Next Day ☐
- RUSH - Two Day ☐
- RUSH - Three Day ☐
- RUSH - Four Day ☐
- Standard(5-7 Days) ☐

Report Type/Deliverables
- Summary Report ____
- Summary w/ QA Summary ____
- CT RCP Package ____
- NY ASP A Package ____
- NY ASP B/CLP Pkg ____
- NJDEP Reduced ____

Electronic Deliverables:
- EDD (Specify Type) ____
- Standard Excel ____
- Regulatory Comparison Excel ____

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature)

Name (printed)

Air Matrix Codes
- AI - INDOOR Ambient Air
- AO- OUTDOOR Amb. Air
- AE- Vapor Extraction Well/ Process Gas/Effluent
- AS- SOIL Vapor/Sub-Slab

TO15 Volatiles and Other Gas Analyses

EPA TO-15 List	EPA TO-14A List
NYSDEC VI list	Tentatively Identified Compounds
NYSDEC STARS List	Air VPH
Project Specific List by TO-15	Helium
NJDEP Target List	Methane
CTDEP RCP Target List	OTHER____

Detection Limits Required
- ≤ 1 ug/m³ ____
- NYSDEC VI Limits ____ (VI vapor intrusion)
- NJDEP low level ____
- Routine Survey ____
- Other____

Special Instructions

Sample Identification	Date Sampled	AIR Matrix	Canister Vacuum Before Sampling (in. Hg)	Canister Vacuum Afer Sampling (in. Hg)	Choose Analyses Needed from the Menu Above and Enter Below	Sampling Media
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____
						6 Liter Summa canister____ Tedlar Bag____

Comments

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in **LAB** by	Date/Time

YORK ANALYTICAL LABORATORIES INC
York Analytical Laboratories
120 Research Dr.
Stratford, CT 06615
(203) 325-1371
Fax (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions.

York Project No. ______________

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type
Company: ____	Company: ____	Company: ____		RUSH - Same Day ☐	Summary Report ____
Address: ____	Address: ____	Address: ____		RUSH - Next Day ☐	Summary w/ QA Summary ____
____	____	____	Purchase Order No.	RUSH - Two Day ☐	CT RCP Package ____
Phone No. ____	Phone No. ____	Phone No. ____		RUSH - Three Day ☐	CTRCP DQA/DUE Pkg ____
Contact Person: ____	Attention: ____	Attention: ____		RUSH - Four Day ☐	NY ASP A Package ____
					NY ASP B Package ____
					NJDEP Red. Deliv. ____
E-Mail Address:	E-Mail Address:	E-Mail Address:	Samples from: CT___ NY___ NJ___	Standard(5-7 Days) ☐	*Electronic Data Deliverables (EDD)*

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

____
Samples Collected/Authorized By (Signature)

____
Name (printed)

Matrix Codes
- S - soil
- Other - specify(oil, etc.)
- WW - wastewater
- GW - groundwater
- DW - drinking water
- Air-A - ambient air
- Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL Met/CN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-Expanded	BTU/lb.
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-Expanded Full List	Aquatic Tox.
Halog. only	NJDEP list	App. IX	Chlordane	Indiv. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Simple Excel ____
NYSDEC EQuIS ____
EQuIS (std) ____
EZ-EDD (EQuIS) ____
NJDEP SRP HazSite EDD ____
GIS/KEY (std) ____
Other ____
York Regulatory Comparison Excel Spreadsheet ____
Compare to the following Regs. (please fill in):

Sample Identification	Date/Time Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)

Comments

Preservation Check those Applicable: 4°C____ Frozen____ HCl____ MeOH____ HNO$_3$____ H$_2$SO$_4$____ NaOH____ ZnAc Ascorbic Acid Other

Special Instructions
Field Filtered ☐
Lab to Filter ☐

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt
_____°C

APPENDIX VI – QUALITY ASSURANCE PROJECT PLAN

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) which was prepared by Cashin Technical Services, Inc. for the Site. A copy of CTS's QAPP is attached to this appendix, Appendix VI.

QUALITY ASSURANCE PROJECT PLAN (QAPP)

for the property located at:

BAYVILLE VILLAGE CLEANERS
SITE NUMBER: V00220
290 BAYVILLE AVENUE
BAYVILLE, NASSAU COUNTY, NEW YORK 11709

prepared for:

Bayville Village Cleaners, Inc., Volunteer

Voluntary Cleanup Agreement: W1-0848-9903

prepared by:

CASHIN TECHNICAL SERVICES, INC.
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788
(631) 348-7600

MAY 2017

TABLE OF CONTENTS

1.0 Purpose and Scope

A Quality Assurance Project Plan (QAPP) is a document that describes the planning, implementation and evaluation steps involved in the acquisition of data that will be used to arrive at a specific goal. This QAPP has been prepared in support of the *Site Management Plan* (SMP) monitoring and sampling activities.

The QAPP will assure the accuracy and precision of data collection during the Site characterization and data interpretation periods. The QAPP identifies procedures for sample collection to mitigate the potential for cross-contamination, as well as analytical requirements necessary to allow for independent data validation.

1.1 Project Organization and Responsibility

Cashin Technical Services, Inc. (CTS) maintains company policies and procedures to ensure that all sample collection and all analyses meet a high degree of quality. These policies and procedures provide confidence that the resulting data provide an accurate representation of the matrix being sampled. This QAPP is primarily concerned with the Quality Assurance (QA) and Quality Control (QC) aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples; field testing; record keeping; data management; chain-of-custody procedures; laboratory analyses; and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be defended.

QA/QC starts with the design of the sampling program and ends with the summarized analytical data submitted in the final report. This QAPP describes all of these policies and procedures.

The project Quality Assurance Officer (QAO) is responsible for ongoing surveillance of project activities, for ensuring conformance to this QAPP, and for evaluating the effectiveness of its requirements. The QAO has access to any personnel or subcontractors, as necessary, to resolve technical problems and take corrective action as

appropriate and has the authority to recommend that work be stopped when there are factors present that may jeopardize quality. The QAO will be available to respond to immediate QA/QC problems.

The primary responsibilities of the QAO are as follows:

- Monitor the correction of QC problems and alert task leaders to where similar problems might occur.
- Develop and maintain project QA files for sampling, monitoring, and field QA records.
- Participate in QA audits.
- Recommend changes to the project manager to improve the effectiveness of the project in reaching its QA objectives for field sampling and monitoring activities.
- Review proposed additions and changes to this QAPP.

The project QA will be maintained under the direction of Mr. Marc Califano of CTS, who will be assigned as the project's QAO, in accordance with this QAPP. QC for specific tasks will be the responsibility of CTS and its contractors/subcontractor, which shall be selected at the time the work is required under the direction of Mr. Marc Califano

The QAPP dictates implementation of the *Site Management Plan* (SMP) and any other investigative work that is required by the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH).

The QAPP has been prepared in accordance with NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (May 2010).

2.0 Quality Assurance Project Plan Objectives

Project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative statements that specify the quality of the data required to support decisions. Data quality is measured by how well the data met the QA/QC goals of the project. In this plan, "Quality Assurance" and "Quality Control" are defined as follows:

- Quality Assurance - The total integrated program for assuring reliability of monitoring and measurement data.
- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

2.1 QA/QC Requirements

QA elements to be evaluated include accuracy, precision, sensitivity, representative and completeness. Reporting of the data must be clear, concise and comprehensive. The data generated by the analytical laboratory for this project is required to be sensitive enough to achieve detection levels low enough to meet Contract Required Quantitation Limits (CRQLs) as specified in NYSDEC Analytical Services Protocol (ASP) for Superfund Contract Laboratory Program (CLP) and United States Environmental Protection Agency (USEPA) SW-846 methods performed in accordance with NYSDEC ASP protocol. The analytical results meeting the CRQLs will provide data sensitive enough to meet the objectives of monitoring and sampling activities described in the *Site Management Plan* (SMP). The QC elements that are important to this project are blank contamination, instrument calibration, completeness of field data, sample-holding times, sample preservation and sample chain of custody.

2.2 Field Instrument Calibration

Quantitative field data to be obtained during groundwater sampling include pH, turbidity, specific conductance, temperature, dissolved oxygen and depth to groundwater. Quantitative water level measurements will be obtained with an electronic sounder or steel tape, which require no calibration. Quantitative field data to be obtained during the performance and monitoring of the

sub-slab depressurization (SSD) system for the presence of volatile organic vapors constituents using a photoionization detector (PID).

Field equipment/instruments used to monitor these parameters and the calibration methods, standards, frequency requirements, and maintenance for each instrument is described in Section 3.0 below. Calibration results will be recorded on the appropriate field forms and in the field book.

2.3 Method Blanks

Method blank or preparation blank is prepared from an analyze-free matrix, which includes the same reagents, internal standards and surrogate standards as the related samples. It is carried through the entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12-hour period during the analysis of samples for Volatile Organic Compounds (VOCs) and once for each batch or twenty (20) samples (whichever is most frequent) for Semi-Volatile Organic Compounds (SVOCs) and metals. Sample values of up to ten (10) times the quantity of Methylene Chloride, Acetone, 2-Butanone, and Phthalate Esters found in the blank must be qualified. For all other target compounds, the method blank must contain less than or equal to the CRQL of any single target compound. For non-target peaks in the method blank, the peak area must be less than 10% of the nearest internal standard. The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

2.4 Field Blanks

A field blank consists of two sets of identical, laboratory-cleaned sample containers. The first set is filled at the laboratory, with de-ionized laboratory-grade water. The water used is from the same source as that used for the laboratory method blank. In the field prior to collecting soil samples, this water will be passed through the field sampling equipment into an additional second set of containers that will then be taken back to the laboratory to be analyzed for the compounds of interest. The purpose of a field blank is to determine whether the field sampling equipment is cross-contaminating soil samples. The rinsate samples will be collected using dedicated sampling equipment provided by the laboratory; therefore, no field blanks will be collected.

2.5 Trip Blanks

Trip blanks consist of a single set of sample containers filled at the laboratory with de-ionized laboratory-grade water. The water used will be from the same source as that used for the laboratory method blank. The containers will be carried into the field and handled and transported in the same manner as the samples collected that day. Analysis of the trip blank for VOCs is used to identify contamination from the air, shipping containers, or from other items coming in contact with the sample bottles. (The bottles holding the trip blanks will be not opened during this procedure). A complete set of trip blanks will be provided with each shipment of groundwater samples to the certified laboratory.

2.6 Duplicates

Duplicate samples are two or more samples considered representative sub-samples of the same source. The samples are identically processed throughout the measurement system. Laboratory duplicate analyses will be performed on liquid and solid matrices at a rate of one (1) for every twenty (20) field samples in a batch or one for every batch of field samples (whichever is more frequent). Duplicate samples will be analyzed as per appropriate methodology. Duplicate analyses for Target Compound List (TCL) compounds will be associated with matrix spike and matrix spike duplicate analyses. The results of the duplicate analyses will be used to assess the precision of the measurement systems.

2.7 Surrogate Spike Analysis

Surrogate standard determinations will be performed on all samples and blanks analyzed by the analytical laboratory. All samples and blanks will be spiked with the appropriate surrogate compounds (as indicated by the methodology) before purging or extraction in order to monitor preparation and analyses of samples. Surrogate spike recoveries shall fall within the advisory limits in accordance with the USEPA SW-846 protocols for samples falling within the quantitation limits without dilution.

2.8 Matrix Spike (MS) / Matrix Spike Duplicate (MSD) / Matrix Spike Blank (MSB) Analysis

MS and MSD analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS/MSD samples will be analyzed for each group of samples of a similar matrix, at a rate of one for every twenty (20) field samples. The Relative Percent Difference (RPD) will be calculated from the difference between the MS and MSD. Matrix spike blank analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

2.9 Procedures Used to Evaluate Laboratory Accuracy and Precision

Data evaluation will be performed by the third party data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review*, and Contract Laboratory Program, *National Functional Guidelines for Inorganic Data Review.* The data review guidance will be used only to the extent that it is applicable to the USEPA SW-846 methods; SW-846 methodologies will be followed primarily and given preference over CLP when differences occur. Also, results of blanks, surrogate spikes, MS/MSDs, and laboratory control samples will be reviewed/evaluated by the data validator. All sample analytical data for each sample matrix shall be evaluated. The third party data validation expert will also evaluate the overall completeness of the data package. Completeness checks will be administered on all data to determine whether deliverables specified in this QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables.

2.10 Sensitivity

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve detection levels low enough to meet the CRQLs as specified by SW¬846 methods. The Method Detection Limits (MDL) for target compounds and target analyses will be established by the analytical laboratory to be well below the remedial objectives and submit appropriate documentation to CTS as required by the QAO.

2.12 Representativeness

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of the site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on-site. A blind duplicate is used to accomplish this task, as well as assessing the precision of the data. Two identical groundwater samples may be collected from one (1) monitoring well and submitted as different samples. The RPD between the two samples should be less than 50%. The use of standardized techniques and statistical sampling methods influences the representativeness of an aliquot of sample to the sample at the site. The representativeness of samples is assured by adherence to sampling procedures presented in this document, therefore no specific representativeness samples are to be collected.

2.13 Completeness

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers and should be between 90% and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data and raw analytical data. The laboratory will be required to submit data packages that follow USEPA SW-846 reporting format, which, at a minimum, will include the following components:

1. All sample chain-of custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analyses in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate results.
7. QC checks sample and standard recovery results.

8. Spike sample result (inorganics).
9. Blank results (field, trip, and method).

2.14 Comparability

Comparability is the degree to which analytical data generated from an individual laboratory can be compared with those from another laboratory, in terms of use of standardized industry methods and equivalent instrumentation techniques. No laboratory split samples will be taken for this project.

3.0 Calibration and Maintenance Procedures of Field Equipment

CTS follows manufacturer's recommendations and guidelines with regard to filed instrument calibration procedures. The calibration of each instrument will be checked prior to each day's use. The date and time of the calibration check, serial number, model number and signature of the calibrating technician will be entered into the field book. If the instrument readings are incorrect, the instrument will be either recalibrated by the technician or returned to the CTS office where it will be further evaluated and/or repaired. If field instruments require major overhauls, the instruments will be returned to the appropriate manufacturer.

Preventive maintenance of field equipment is performed routinely before each sampling event and more extensive maintenance is performed based on hours of use. The CTS equipment coordinator has overall responsibility for the preventive maintenance program. However, certain maintenance programs are overseen by the project manager. Routinely, manually operated sampling equipment is checked to ensure it operates properly and that excessive wear has not occurred. If necessary, equipment is taken out of service for repair or replacement.

4.0 Sample Custody Procedures

The handling of samples in the field and in the laboratory will conform to the sample custody procedures presented in this section. Field custody procedures involve proper sample identification, chain-of-custody forms, packaging and shipping procedures. Laboratory custody begins with the receipt of samples by the laboratory and continues through sample storage, analysis, data reporting and data archiving. This section provides the procedures that will be followed during the course of the project to ensure proper sample custody.

4.1 Field Custody Procedures for Off-Site Laboratory

The following elements are important for maintaining the field custody of samples:

Sample identification

- Sample labels
- Custody records
- Shipping records
- Packaging procedures

Sample labels will be attached to all sampling bottles before field activities begin. Each label will contain an identifying number and each number will have a suffix that identifies the site and where the sample was collected. The sampling suffix will correspond to the sampling locations shown on the Site Sampling Location Plan included in Appendix A. Additionally, the sampling time, type of sample and sample identification will be entered into the field book. A chain-of-custody form will accompany the sample bottles from the laboratory into the field. After each sample is collected and appropriately identified entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers' names and signatures
- Names and signatures of persons involved in chain of possession
- Sample number
- Number of containers
- Sampling station identification

- Date and time of collection
- Type of sample and the analyses requested
- Preservatives used (if any)
- Pertinent field data i.e. pH, temperature, turbidity, etc. (if any)

After sampling has been completed, the samplers' will return/ship the samples to the laboratory or the laboratory courier will pick-up the samples from the job site. The sampler will sign and date the "relinquished" blank space. One copy of the custody form will remain with the field personnel and the remaining copies will accompany the samples to the laboratory. The laboratory will receive all samples within 24 hours of collection. Samples will be received by laboratory personnel, who will assume custody of the samples and sign and date the next "received" blank.

4.2 Laboratory Custody Procedures

Upon receipt by the analytical laboratory, samples will proceed through an orderly processing sequence specifically designed to ensure continuous integrity of both the sample and its documentation. All samples will be received by the laboratory's sample control group and will be carefully checked for label identification and completed accurate chain-of-custody records. The sample will be tracked from storage through the laboratory system until the analytical process is completed and the sample is returned to the custody of the sample control group for disposal.

5.0 Sample Preparation and Analytical Procedures

Containers, preservation and holding times of environmental samples will be applied as detailed in the NYSDEC ASP. The holding time of samples for VOC analysis of all matrices will be seven (7) days and five (5) days for SVOC analyses from the Verified Time of Sample Receipt (VTSR). Analyses of environmental samples will be performed by the protocol requirements of the USEPA SW-846.

Samples will be analyzed by the following methods:

Groundwater Samples:	VOCs by USEPA Method 8260
Soil Gas and Air Samples:	VOCs by USEPA Method TO-15

If any modifications or additions to the standard procedures are anticipated, and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented.

6.0 Data Reduction, Validation, Review and Reporting

The process of data reduction, review, and reporting ensures that assessments or conclusions based on the final data accurately reflect actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data and reports are proofed and checked for technical and numerical errors prior to final submission.

6.1 Data Reduction

Data reduction is the process by which raw analytical data generated from the laboratory instrument systems are converted into usable mass concentrations. The raw data, which may take the form of summation of areas under the curve instrument responses, or observations is processed by the laboratory and converted into concentrations expressed as ug/L for liquid samples. The analytical laboratory will be required to follow USEPA SW-846 data reduction procedures.

Data reduction also includes the process by which raw field data is summarized into tables and graphs, from which quantitative or qualitative assessments can be derived by filter integration and evaluation. Field data that is anomalous will be thrown out to create a linear interpretation of the data that depicts a more accurate trend.

Field data obtained during sampling is summarized on appropriate field forms. This information will be used to assess field conditions at the time of sampling and is summarized and analyzed along with the chemistry data in the final report. Occasionally, the reduction of actual field data requires correcting measurement data for the measurement system's baseline value. The data will be adjusted only after the raw data has been submitted to CTS's QAO and prior to preparation of the final report.

6.2 Validation

Data validation is the systematic process by which data quality is determined with respect to data quality criteria that are defined in project and laboratory QC programs and within the referenced

analytical methods. The data validation process consists of an assessment of the acceptability or validity of project data with respect to the stated project goals and the requirements for data usability. Ideally, data validation establishes the data quality in terms of project DQOs. Data validation consists of data editing, screening, checking, auditing, certification, review and interpretation.

The purpose of data validation is to define and document analytical data quality and determine whether the laboratory data quality is sufficient for the intended use(s) of the data. An approved independent data evaluator will not review data prior to its use in reports prepared by CTS unless requested by the NYSDEC. Both the field and laboratory data will be subjected to a level of data validation commensurate with the required data quality level.

If an independent validator is required, the data validator will review the data from compliance by performing the following tasks:

6.2.1 Task I – Determine Data Completeness

Each data package will be reviewed for completeness. A complete data package will at a minimum contain following components:

All sample chain-of-custody forms.

- The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
- QA/QC summaries.
- All relevant calibration data summaries.
- Instrument and method performance data.
- Documentation demonstrating the laboratory's ability to attain the contract specified method detection limits for all target analyses in all required matrices.

If during the review process it is found that deficiencies exist in the data package, the analytical laboratory will be contacted and given ten (10) calendar days to produce the documentation necessary to remove these deficiencies.

6.2.2 Task II – Determine Data Compliance

Each data package will be reviewed to determine compliance with those portions of this QAPP that pertain to the production of laboratory data.

Compliance is defined by the following criteria:

- The data package is complete as defined in Task I above.
- The data have been produced and reported in a manner consistent with the requirements of this plan and the laboratory subcontract.
- All protocol-required QA/QC criteria have been met.
- All instrument calibration requirements have been met for the time frame during
- Which the analyses were completed.
- All protocol required initial and continuing calibration summaries have been presented.
- All data reporting forms are complete for all samples submitted. This will include all requisite flags, all sample dilution/concentration factors and all pre-measurement sample cleanup procedures.
- All problems encountered during the analytical process have been reported in the case narrative along with any and all actions taken by the laboratory to correct these problems.
- Verifying that calibration procedures were followed.
- Verifying that data are reported in correct units.
- Checking 10% of all field calculations.
- Verifying that samples were properly shipped with the appropriate chain-of-custody documentation.
- Verifying that QC samples were prepared and taken.

CTS's QAO will perform further review of such data prior to data integration and evaluation. All assigned data reduction or analytical procedures will be verified for accuracy and content by the QAO, who is qualified and experienced in evaluating the particular technical specialty.

6.3 CTS Laboratory Data Review

The QAO or a designee under the project manager's supervision, will review each analytical data package for completeness (i.e., Have all the analyses requested been performed?) and general protocol compliance, such as holding times, detection limits, spike recoveries and surrogate recoveries. The results of this review will be summarized and submitted to the independent validator with the data package. If information is found to be missing from the data package the analytical laboratory will be contacted and requested to submit any missing information.

6.3.1 Usability Report

Upon completion of data validation, CTS's QAO will perform a data usability analysis on all analytical laboratory data. Taking into account protocols for sampling, transport, analysis, reduction, reporting and the data validation report, the QAO will use this information and his/her own experience to establish whether the results of each analysis can be used for the purpose intended. It will be determined whether the final results can be used as reported, qualified to indicate limitations, or rejected outright.

6.4 CTS Field Data Reporting

Groundwater field measurements may include pH, turbidity, specific conductance, temperature, dissolved oxygen and depth to groundwater. Quantitative field data to be obtained during the performance and monitoring of the SSD system for the presence of volatile organic vapors constituents using a photoionization detector (PID). All field real-time measurements and observations will be recorded in project field book or field data forms. If entries are changed, the change will not obscure the original entry and the correction will be signed. Field data records will be organized into standard formats whenever possible and retained in permanent files.

6.5 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the USEPA SW-846 deliverable requirements as applicable to the method utilized.

6.5.1 Data Usage

The data will be used to define the nature and extent of the suspected contamination at the subject site.

7.0 Internal Quality Control

QC checks will be performed to ensure the collection of representative and valid data. Internal QC refers to all data compilation and contaminant measurements. QC checks will be used to monitor project activities to determine whether QA objectives are being met. All specific internal QC checks to be used are identified in this section.

7.1 Laboratory Quality Control

The analytical laboratory is required to exercise internal control in a manner consistent with the requirements of this QAPP. Control checks and internal QC audits are required by the NYSDEC ASP methods. These include reference material analysis, blank analysis. MS/MSD analysis, cleanups, instrument adjustments and calibrations, standards and internal audits. One qualified professional will proof and check all final reports for transcription and/or calculation errors. Twenty (20) percent of all final reports will be subsequently checked again by a qualified professional. All data tables will be checked to ensure no transcription errors have occurred. Data tables will also be checked to see that any criteria cited for comparison purposes is appropriate and correctly referenced. All calculations will be checked to ensure that they will be properly presented and that resulting values are achievable. If any results cannot be duplicated the calculations will be independently checked for accuracy.

8.0 Performance and System Audits

Performance audits, when performed, will be used to monitor project activities to assure compliance with project DQOs. The following text summarizes the field audits that are conducted periodically.

8.1 Field Audits

CTS periodically conducts internal audits of field activities. CTS's on-site project manager will routinely monitor all field activities to ensure that work is done correctly. All sampling and analytical work will be reviewed routinely by the project manager. All data sheets obtained in the field will be initialed and dated by project manager after review and acceptance of the services performed. A field audit will include monitoring and evaluation of sample collection, sample holding times, preservation techniques, field QC and equipment calibration. These audit forms will be kept on file with the CTS project manager for a period of at least one (1) year after completion of the project, then will be transferred to storage and held for an additional five (5) years.

9.0 Analytical Corrective Action

Corrective actions will be implemented if unsatisfactory performance and/or system audit results indicate that problems exist. Corrective action may also be implemented if the result of a data assessment or internal QC check warrants such action.

APPENDIX VII – HEALTH AND SAFETY PLAN

The site-specific Health and Safety Plan will be followed during all applicable SSD system operation, maintenance, and monitoring as prepared by Cashin Technical Services, Inc. A copy of CTS's HASP is attached to this appendix, Appendix VII.

HEALTH AND SAFETY PLAN

for the property located at:

BAYVILLE VILLAGE CLEANERS
SITE NUMBER: V00220
290 BAYVILLE AVENUE
BAYVILLE, NASSAU COUNTY, NEW YORK 11709

prepared for:

Bayville Village Cleaners, Inc., Volunteer

Voluntary Cleanup Agreement: W1-0848-9903

prepared by:

CASHIN TECHNICAL SERVICES, INC.
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788
(631) 348-7600

MAY 2017

REVISED MAY 2018

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Attachments

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1.0 INTRODUCTION

1.1 Purpose and Scope

Cashin Technical Services, Inc. (CTS) employees may be exposed to risks from site-related hazardous conditions while performing field activities at the Bayville Village Cleaners located at 290 Bayville Avenue, Bayville, New York 11709 (hereafter referred to as the subject "Site or "Facility" as shown the Site Location Plan enclosed in Attachment 1.

This CTS Health and Safety Plan (HASP) has been formulated as per the requirement of the New York State Department of Environmental Conservation (NYSDEC) for this Project, and to ensure that the activities pursuant to the scope of work detailed below are conducted in a manner that protects the health and safety of CTS personnel, owners' representatives, contractors, subcontractors, NYSDEC, other personnel working on-site, the public and any site visitors.

All personnel assigned to this Project must read this HASP, and then sign the Agreement/Acknowledgment form provided in Attachment 2 to confirm that they understand and agree to abide by the provisions of this HASP.

All contractor and subcontractors personnel will be expected to review and comply with all of the provisions put forth by this HASP.

1.2 Applicability

Occupational Safety and Health Administration (OSHA) Code of Federal Regulations (CFR) Title 29 §1910.120(b) states that employers shall develop and implement a written safety and health program for their employees involved in potentially hazardous site operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations. This Plan was prepared in accordance with applicable provisions of OSHA regulations 29 CFR 1910 and 1926.

This HASP contains project-specific emergency information, hazard analysis, and project information that can be used in conjunction with standardized guidance procedures and practices. This HASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen site conditions, which may arise. This HASP may be modified or amended to meet the specific needs of the proposed work as it occurs at the site.

CTS may require that on-site personnel take certain precautions in accordance with this HASP, and CTS may request that others protect their personnel in a manner that they deem necessary or sufficient.

2.0 ORGANIZATIONAL STRUCTURE

The specific Project roles, chain-of-command and the overall responsibilities of supervisors and employees are as follows:

2.1 Roles and Contacts

Cashin Technical Services, Inc. (CTS) is the Consultant for this Project. Project roles include the following:

- CTS Project Manager (Office): Francis Cashin, III, P.E.
  Office phone: (631) 348-7600

- CTS Site Representative: Marc Califano
  Office phone: (631) 348-7600
  Cell phone: (631) 236-7868

- On-Site Safety Coordinator Marc Califano
  Office phone: (631) 348-7600
  Cell phone: (631) 236-7868

- On-Site Health and Safety Officer Marc Califano
  Office phone: (631) 348-7600
  Cell phone: (631) 236-7868

- Regulatory Contact Information Jahan Reza, P.E.
  NYSDEC – Region 1 Office
  Stony Brook, New York
  (631) 444-0242

General Area Emergency Locations and Contact Information

EMERGENCY SERVICES	NAME	TELEPHONE NO.
Hospitals / Critical Care	North Shore LIJ Glen Cove Hospital 101 St Andrews Lane, Glen Cove, NY	(516) 674-7300
Other	Fire, Police, Ambulance	911
Poison Control Center	New York City Department of Health and Mental Hygiene 455 First Avenue, Room 123 New York, New York 10016	Emergency Toll Free: 1-800-222-1222 TTY: (212) 689-9014
NYSDEC Spill Hotline	Region I Office - Stony Brook, NY	1-800-457-7362

Direction to hospital from Site (See Attachment 1, Hospital Location Map): Start from Bayville Village Cleaners, go west along Bayville Avenue, continue on Horse Hollow Road, turn left at Lattington Road, turn slight right onto Skunks Misery Road, continue onto Forest Avenue, turn left onto Walnut Road, arrive at 101 St. Andrews Lane (North Shore University Hospital).

2.2 HASP Responsibilities

General Responsibilities

- Before beginning field sampling/testing activities and related monitoring and inspection activities, CTS (consultant) and contractor personnel will review this HASP. All CTS and contractor personnel are responsible for complying with this HASP.

- If deemed appropriate by the CTS representative, health and safety "tailgate" meetings may be held at any time during on-site operations, including kick-off, to address site-specific hazards and procedures.

- The CTS representative will oversee the overall HASP. He has the authority to stop work or prohibit personnel from working on the site at any time for not

complying with any aspect of the plan. This authority is also extended to CTS Health and Safety Coordinator(s) and CTS Project Manager(s).

- Each person on the site has responsibility for their own health and safety, as well as assisting others in carrying out the HASP. Any person observed to be in violation of the HASP should be reported to the CTS Competent Person.

CTS Competent Person/Site Representative Responsibilities

- Competent Person: CTS shall have available on the job site a representative who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

- Ensure that CTS and contractor personnel are informed on the hazards to which they may be exposed.

- Exemplify safe behavior with his own safety practices.

- Implement actions to prevent injuries, illnesses, and accidents.

- Remain alert to changes in work conditions or habits which might cause health and safety concerns.

- Develop specific health and safety procedures as necessary and alert on-site personnel to the procedures.

- Assist with timely and thorough accident/incident procedures and complete any necessary accident/incident reports.

- Inspect and document equipment for safe operating condition, availability of personal protective equipment (PPE), and orderly housekeeping.

On-Site Personnel Responsibilities

- Comply with recognized health and safety practices as put forth in the CTS HASP.

- Report promptly to their supervisor all work-related injuries, illnesses, accidents, incidents and near misses; assist with accurate completion of incident reports.

- Report promptly to their supervisor any non-work related injuries, illnesses, or physical limitations which might affect job-related health and safety.

- Use PPE as required by work practices and as put forth in the CTS HASP. Keep all PPE in good operating condition.

- Be certain to understand the hazards associated with materials and/or tasks before beginning the work; if in doubt, consult a supervisor.

- Suspend an operation or deactivate equipment in the event of immediate danger to health or life; report such actions immediately to a supervisor.

- Maintain equipment in safe operating order; report any deficiencies immediately to a supervisor.

- Keep all work areas neat and orderly; practice good housekeeping.

CTS Responsibilities

CTS's role in the health and safety aspect of the Project will include the implementation of, and compliance with, this HASP by CTS and contractor personnel. Additionally, CTS will review any monitoring/sampling data, be alert to potential situations on-site, will comply with any dress codes and personal protection requirements, will make daily reports of site activities, will participate in

the scheduling of work, and will be available for any general site health and safety issues requiring consultation.

CTS will ensure that all on-site personnel have been provided with the proper health and safety knowledge and training, and that they are in compliance with applicable health and safety regulations/requirements.

CTS personnel will be at the site on scheduled field sampling/testing activities and related monitoring and inspection activities during the project.

2.3 Training Requirements

Training makes workers aware of the potential hazards they may encounter and provides the necessary knowledge and skills to perform their work with minimal risk to their health and safety. Minimum training, respirator fit-testing, and medical surveillance for site personnel (for all field people working with any hazardous materials) includes:

- 40-Hr. Initial Hazardous Waste Operations Training (HAZWOPER) 29 CFR 1910.120
- 8-Hr. Supervisor HAZWOPER Training for Managers/Supervisors, Site Health and Safety Officer (HSO)
- 24-Hr. HAZWOPER for construction crew
- 8-Hr. Annual HAZWOPER Refresher Training
- Annual Respirator Fit Testing
- Annual Medical Clearance and Respirator Clearance by a Physician

3.0 POTENTIAL HAZARDS

3.1 General

The major route of exposure to potential contaminants will be respiratory; however, dermal exposure may also be possible. Inhalation of vapors and contaminated dusts would provide the mechanism for respiratory exposure. Skin contact with soils and groundwater would result in dermal exposure. **Tetrachloroethylene or Perchloroethylene** (PCE) is the compound of highest concern both due to its suspected carcinogenicity and its high vapor pressure. **Trichloroethene** (TCE) has also been identified as a compound of concern because of past and existing presence in soil and groundwater. The International Agency for Research on Cancer (IRAC) has classified PCE and TCE as probable human carcinogens. Personal Protective Equipment (PPE) will reduce the amount of potential exposure along with the existing SSD system installed at the subject site. Air monitoring and personal protection devices will also serve to prevent exposure to chemicals.

Other site hazardous include those that exist on all sites where heavy equipment, industrial and construction type operations take place, e.g., dangers from falling equipment, cuts, abrasions, and contusions.

Appropriate precautions will be taken during site activities to ensure the health and safety of all personnel.

During typical work activities, surfaces can be expected to become uneven and slippery, causing unsure footing and requiring additional care by personnel engaged in operations. Additional site hazards are presented by the possibility of airborne and waterborne transport of hazardous materials and the presence of contaminated soils, vessels, and equipment.

Competent Person: CTS shall have available on the job site a representative who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3.2 Traffic

Worker exposure to traffic is a significant potential hazard whenever work is being performed in roadways, parking lots, driveways or in the vicinity of moving vehicles. Workers should always be aware of traffic and traffic conditions when working in these situations.

3.3 Trenching/Excavation

NOT IN PROJECT - It is CTS's understanding that work involving trenching/excavation is not anticipated as part of the planned operations and will therefore not be a health and safety concern during this Project.

3.4 Confined Space

NOT IN PROJECT - It is CTS's understanding that work in Confined Space(s) is not anticipated as part of the planned operations and will therefore not be a health and safety concern during this Project.

3.5 Utilities (Overhead and Underground)

CTS is to ensure that the necessary underground utility mark-out call(s) are made prior to the beginning of any subsurface work on the Project. Additionally, CTS may retain the services of a subcontractor to perform a private underground utility mark-out utilizing metal detection and/or ground penetrating radar (GPR) devices, with appropriate ground markings in spray paint.

When the potential exists for proximity or contact with energized overhead lines or equipment, work shall not begin until a safety meeting is conducted, and pertinent steps are taken to identify, mark-out, and warn against accidental contact.

3.6 Silica

NOT IN PROJECT - It is CTS's understanding that work involving Silica exposure is not anticipated as part of the planned operations and will therefore not be a health and safety concern during this Project.

3.7 Asbestos

NOT IN PROJECT - It is CTS's understanding that work involving Asbestos Containing Materials (ACMs) is not anticipated as part of the planned operations and will therefore not be a health and safety concern during this Project.

3.8 Hazardous Materials

Hazardous substances are defined as the suspected or known hazardous substance stored, within any media (contaminated), etc.

In soils: Volatile Organic Compounds (VOCs) identified as being contained in soils are **Tetrachloroethylene or perchloroethylene** (PCE) and **Trichloroethene** (TCE).

In groundwater: VOCs identified as being contained in groundwater are PCE and TCE.

In soil vapor: VOCs identified as being contained in soil vapor are PCE and TCE.

If *unanticipated* hazardous materials are encountered during operations, CTS will stop work, secure the immediate area, and notify the Project Manager, Spills authorities and other appropriate entities. All *encountered* materials classified as hazardous, such as asbestos, chemicals, gases, flammable materials, etc. shall be removed and disposed of or remediated (by an outside contractor) in accordance with all applicable rules, regulations and laws concerning hazardous materials.

The Contingency Plan for any *unanticipated* encounters with subsurface tanks, drums or refuse consists of:

- Stop work immediately and vacate the immediate area
- Notify the Project Manager
- Cordon off the area
- Upgrade personal protection accordingly
- Take sample(s) of material(s) – outside contractor
- Properly dispose of material(s) – outside contractor

3.9 Biological Hazards

Potential biological hazards include insects, wild/rabid animals and infectious wastes. It is recommended that on-site personnel should wear long-sleeved shirts, long pants and insect repellant. Personnel should check themselves for bites and rashes. Body parts that have been exposed to, or come in contact with, these potential hazards should be thoroughly washed and observed for symptoms.

4.0 GENERAL SITE HEALTH AND SAFETY PROCEDURES

4.1 Site Work Zones

Prior to the start of any field remedial activities, the CTS representative will be responsible for the designation of the work zone. The *work zone* will be divided into three areas: a support zone, a contaminant reduction zone and an exclusion zone based on the degree of danger present. To the extent possible, the support and contaminant reduction zones will be established outside of the exclusion zone.

4.2 Support Zone

The support zone will be located outside of the exclusion zone. Personnel allowed in this area include all site personnel, visitors and representatives of regulatory agencies and observers. No particular training or PPE equipment are needed in the support zone/clean area.

4.3 Contaminant Reduction Zone

The contaminant reduction zone will be located between the support zone and the designated exclusion zone. In this area authorized personnel will wear protective equipment, as needed in the exclusion zone. When exiting the contaminant reduction zone, personnel will remove contaminated PPE.

4.4 Exclusion Zone

The exclusion zone is in the immediate work area and that adjacent area as defined by the safety coordinator. Attempts will be made so that equipment and site activities taking place in the exclusion zone are situated so that personnel are upwind of sources. Fans or blowers will be used, if necessary, to disperse gases released during site-related activities.

4.5 Task Specific Level of Protection

See Table 1 below for levels of personal protective equipment (PPE) requirements.

4.6 Communications

At this point, all proposed site-related work would be conducted in Level D PPE during field sampling/testing activities and related monitoring and inspection activities as described in the Site Management Plan (SMP). In the event that either Level C or Level B respiratory protection is used, hand signals will be developed for communications.

4.7 Work Practices, Limitations and Restrictions

- All personnel at the job site must be participants in a health and safety program.

- A copy of the HASP will be available for reference at the site during the planned field activities. All site workers scheduled for field activities will read and acknowledge comprehension of this HASP. Site visitors will also be required to read and acknowledge their understanding of plan requirements.

- All site personnel will monitor Personal Protective Equipment (PPE), such as hearing protection, to ensure that it is in good condition, and immediately replace any broken or damaged items.

- Whenever unsafe practice is observed, the worker will be informed that he has violated Safety Regulations. The individual will be told what the unsafe act was and how to do the job safely. If the worker violates that policy a second time, a warning will be given in the form of a written statement which will identify the specific violation and explain the correct procedure. The warning will also state that, if the violation is repeated, the individual will be removed from the job site.

- No eating, drinking or smoking within the work zones.

- No sources of ignition, such as matches or lighters, will be permitted in the work zones.

- No rings, loose-fitting watches, bracelets, necklaces, or other jewelry that could trap chemical contamination or get caught in moving equipment. Loose-fitting clothing or loose long hair will also be prohibited in work zones.

- No work will be performed outdoors during hazardous weather conditions, such as lightning and thunderstorms.

- Use sunscreen on unprotected skin to protect against ultraviolet exposure as necessary.

- Use of ground fault circuit interrupters for plug-in electrical devices and extension cords (3-pin plugs only).

- Hearing protection in the form of disposable earplugs will be worn around heavy equipment and machinery.

- Work should stop if any worker(s) experience any the following symptoms: muscle spasm and/or pain in the limbs or abdomen (heat cramps); weak pulse, heavy sweating, dizziness, and/or fatigue (heat exhaustion); or rapid pulse, no sweating, nausea, dizziness, and/or confusion (heat stroke). Provide first aid immediately.

- All injuries should be immediately reported to the Project Manager; the Project Manager should be notified of any illness while on the job; an injured or ill person should not be moved, unless to prevent further injury, until appropriate help arrives.

4.8 Emergency Response Plan / Contingency Plan

The following procedures must be followed in the event of an emergency. All accidents or unusual events are to be reported to the Project Manager by on-site personnel. All on-site personnel will be responsible for conducting the emergency response in an efficient, fast and safe manner. A Competent Person or Project Manager will decide if first aid or off-site assistance of medical treatment is necessary.

If help is required by emergency medical personnel, 911 should be called immediately.

If injury to on-site personnel involves *chemical exposure*, the following first aid procedures must be initiated as soon as possible.

- Eye exposure – if solid or liquid gets into the eyes, wash eyes immediately with water at the emergency eyewash station, lifting the lower and upper lids occasionally.

- Skin exposure – if solid or liquid gets on the skin, wash skin immediately with water at the emergency eyewash station. Obtain medical attention immediately.

- Inhalation – if a person inhales large amounts of organic vapor, dust, etc. move to fresh air at once and obtain medical attention immediately. If breathing has stopped, appropriately trained personnel should perform CPR. Keep affected person warm and at rest.

- Ingestion – if solid or liquid is swallowed, medical attention must be obtained immediately and the Poison Control Center consulted.

First-aid treatment for all forms of heat stress includes cooling the body by moving to an area outside the work zone(s), removing PPE, and allowing the person to rest in a cooler environment.

First-aid treatment for frostbite includes protecting the frozen area(s) from further injury, bringing the victim indoors, warming the affected area(s) quickly with warm water, and maintaining respiration. Medical help should be called immediately.

4.9 Emergency Equipment

A functioning fire extinguisher and a stocked first aid kit are to be kept on-site during field work.

The fire extinguisher will be located in/on Contractor vehicle(s) and inside the subject building.

The first aid kit will be located in/on Contractor vehicle(s).

On-site personnel should be knowledgeable in fire-extinguishing techniques. The fire extinguisher kept at the job site by the Contractor should be used for small fires in the early stages. Evacuate the area immediately if an extinguisher cannot control the fire, and call the fire department.

Incident / Injury reports will be completed by CTS personnel (Attachments 3 and 4)

4.10 Evacuation Plan

If emergency evacuation of a work site is required, workers will be notified directly or by walkie-talkie, all engine and motorized equipment will be shut down, and all on-site personnel will meet at a pre-determined location so that a head count can be taken.

5.0 HEALTH AND SAFETY EQUIPMENT

5.1 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) must be used in all operations where there is a known potential exposure to hazardous conditions, as per the OSHA requirements of 29 CFR 1910.120 App B.

PPE used on the Project will include, but may not be limited to, the following:

- Safety glasses, gloves, dust masks and protective clothing will be worn when applicable, and
- Hearing protection will be used by employees operating high noise-emitting equipment.

Levels of protection for general operations are provided below and are defined in this section. However, to implement the SMP, all proposed site-related work would be conducted in Level D PPE during field sampling/testing activities and related monitoring and inspection activities.

Levels of protection may be upgraded or downgraded at the discretion of the Competent Person or Project Manager. That type of decision shall be based on current observations and conditions, site history data, and prior site experience.

5.2 PPE Specifications

Selection of the appropriate PPE is an important process which should take into account a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards; their routes of potential hazard to employees (inhalation, skin absorption, ingestion, eye or skin contact); and the performance of the PPE materials (and seams) in providing a barrier to these hazards.

Contractor employees must maintain proficiency in the use and care of PPE that is to be worn. Typically this is covered during formal and informal refresher training

sessions. Prior to usage, all equipment must be inspected to ensure proper working conditions. Designated PPE levels, based on the degree of protection afforded, are detailed below in Table 1.

TABLE 1

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Location	Level	Respiratory Requirements	Other Requirements
Field sampling/testing activities and related monitoring and inspection activities associated with the SMP	Level D	Dust mask	Disposable coveralls; Steel-toe, chemical-resistant boots; Approved safety glasses or goggles; Hard hat; Chemical-resistant gloves; Fluorescent vest
Support Zone	Level D	Dust mask	Disposable coveralls; Steel-toe, chemical-resistant boots; Approved safety glasses or goggles; Hard hat; Chemical-resistant gloves; Fluorescent vest
Exclusion Zone and Contamination Reduction Zone	Modified Level D-1	Dust mask	Level D, plus: PE-coated Tyvek suit; Nitrile or Latex gloves and liners; Latex booties or rubber over boots; Hearing protection (muffs and/or plugs)
Exclusion Zone and Contamination Reduction Zone	Level C	NIOSH/MSHA-approved, full or half face air-purifying respirator, with HEPA/organic vapor/acid gas cartridges	Same as Modified Level D-1

Exclusion Zone and Contamination Reduction Zone	Level B	NIOSH/MSHA-approved, full-face, positive-demand, self-contained breathing apparatus (SCBA)	Level D-1, plus: Hooded, chemical-resistant clothing (overalls and long-sleeved jacket, coveralls, one or two piece chemical-splash suit, or disposable chemical-resistant overalls)

6.0 Monitoring Procedures

Monitoring the site for the identity of contaminants and contaminant concentrations in all media:

Direct reading instruments will be used in active work areas in order to enable rapid field decisions regarding levels of respiratory protection, as well as indicate the need for increased monitoring frequency at the edge of the exclusion zone.

A Photo Ionization Detector (PID), which will be calibrated daily and adjusted to give maximum sensitivity to the contaminants of concern, will be used to monitor the air on a continuous basis while air, soil and/or groundwater sampling activities are performed.

6.1 Task Specific Monitoring

The following task specific monitoring will occur at the Site:

Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
SSD System	Vacuum Blower Audio and Visual Blower Alarm General System Piping	334 CFM N/A N/A	Annually Daily/Annually Annually
Magnehelic Differential Pressure	Interior Vacuum Test Points	⁻0.1 – ⁻100.0 psi	Annually, at the time of Remedial System Sampling
SSD System Ports	PID Readings	0.0 – 100 ppm	Annually, at the time of Remedial System Sampling
Granular Activated Carbon Vessel	PID Readings	0.0 – 100 ppm	Annually, at the time of Remedial System Sampling

Remedial System Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOC's (EPA Method TO-15)				
AA-1	X				Annually
Influent	X				Annually
Effluent	X				Annually

Soil Vapor Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOC's (EPA Method TO-15)				
PPB-1	X				Annually
PP-2	X				Annually
PP-3	X				Annually
PP-4	X				Annually
PPB-5	X				Annually
PPB-6	X				Annually

Groundwater Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOC's (6 NYCRR Part 703)				
MW-1	X				Annually
MW-2	X				Annually
MW-3	X				Annually
MW-4	X				Annually

Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOC's (EPA Method TO-15)				
AA-1	X				Annually
Influent	X				Annually

Off-Site Residence Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOC's EPA method TO-15 24 hour regulator			
Southerly Adjacent Residence SSSV	X			During the 2018 – 2019 Heating Season
Southerly Adjacent Residence Indoor Air	X			During the 2018 – 2019 Heating Season
Southerly Adjacent Residence Outside Air	X			During the 2018 – 2019 Heating Season

Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

Asbestos Exposure Monitoring

NOT IN PROJECT - It is CTS's understanding that work involving Asbestos Containing Materials (ACMs) is not anticipated as part of the planned operations and will therefore not be a health and safety concern during this Project.

7.0 Decontamination and Disposal

Decontamination procedures apply to all contaminated personnel, surfaces, materials, instruments, equipment, etc. PPE will be removed prior to removing any respiratory protection. All personnel will thoroughly wash their hands and face before leaving the Site. Subsurface tools will be steam-cleaned or washed with Alconox detergent and water, then followed by a DI rinse and/or air drying.

Disposal procedures also apply to all contaminated equipment, supplies, disposable items and wash water. Any PPE will be bagged and contained in a drum designated for PPE disposal. All decontamination water and materials will also be drummed and disposed off-site.

ATTACHMENT 1

SITE LOCATION PLAN

&

HOSPITAL LOCATION MAP

SITE LOCATION PLAN

Bayville Village Cleaners

290 Bayville Avenue

Bayville, New York

Cashin Associates, P.C.
ENGINEERING·PLANNING·CONSTRUCTION MANAGEMENT

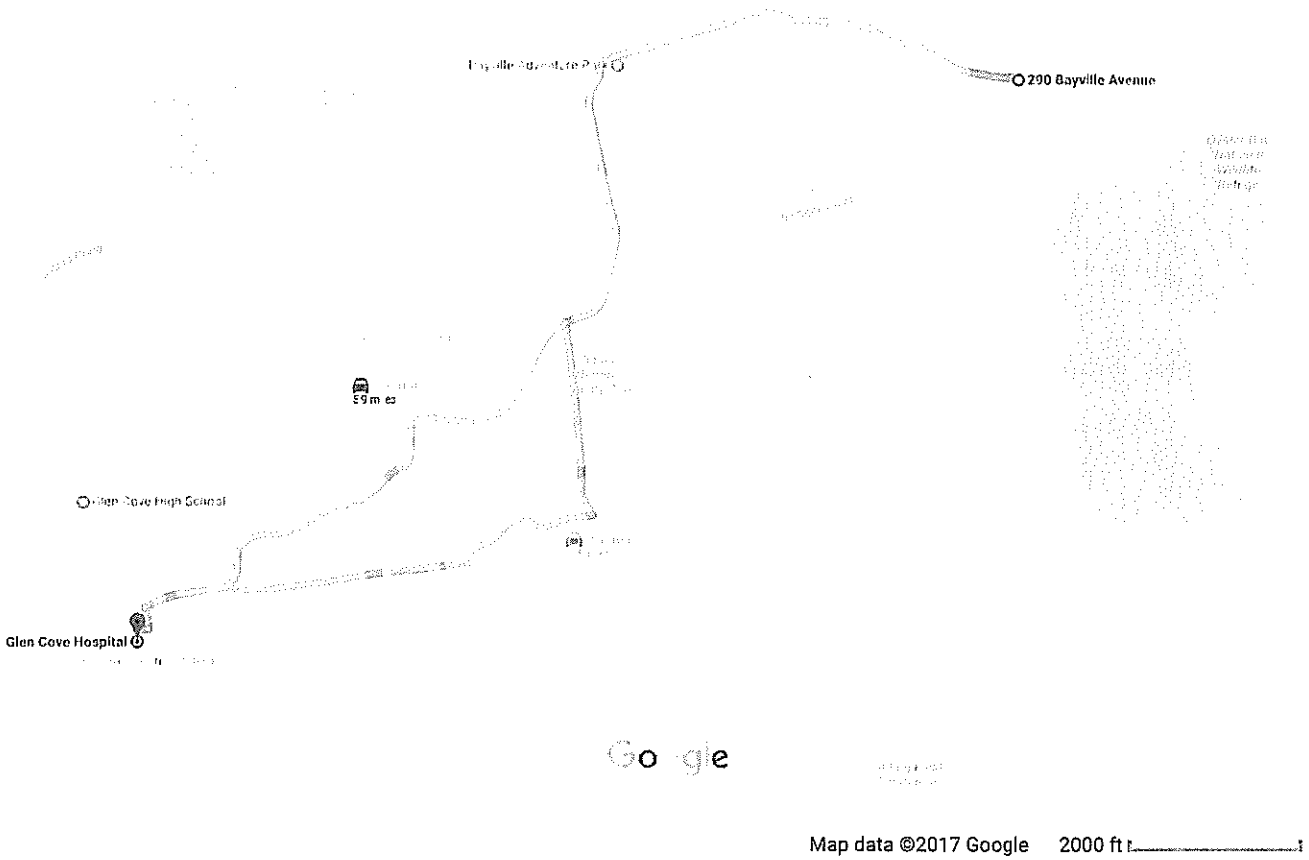
13CTS.022

Google Maps

290 Bayville Ave, Bayville, NY 11709 to Glen Cove Hospital

Drive 5.9 miles, 13 min

(516) 674-7300



290 Bayville Ave

Bayville, NY 11709

Take Bayville Ave, Horse Hollow Rd and Skunks Misery Rd to St Andrews Ln in Glen Cove

13 min (5.8 mi)

1. Head west on Bayville Ave toward Pine Park Ave

3.2 mi

2. Continue straight onto Horse Hollow Rd

0.9 mi

3. Turn left onto Lattingtown Rd

0.2 mi

4. Slight right onto Skunks Misery Rd

0.9 mi

5. Continue onto Lattingtown Rd

344 ft

6. Continue onto Forest Ave

0.4 mi

7. Turn left onto Walnut Rd

0.1 mi

8. Turn right onto St Andrews Ln

Destination will be on the left

22 s (305 ft)

Glen Cove Hospital

101 St Andrews Ln, Glen Cove, NY 11542

ATTACHMENT 2

HASP ACKNOWLEDGMENT/ AGREEMENT FORM

ATTACHMENT 2

CASHIN TECHNICAL SERVICES, INC.

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT AND AGREEMENT FORM
(All Cashin Technical Services, Inc. (CTS) and contractor personnel must sign)

I acknowledge that I have reviewed a copy of the Health and Safety Plan for this project, understand it, and agree to comply with all of its provisions. I also understand that I could be prohibited by the Site Health and Safety Officer or other **CTS** personnel from working on this project for not complying with any aspect of this Health and Safety Plan:

Name	Signature	Company	Date

ATTACHMENT 3

SITE INCIDENT REPORT

ATTACHMENT 3

CASHIN TECHNICAL SERVICES, INC.

SITE INCIDENT REPORT

(Attach additional documentation as necessary)

Date of Incident: _____ Time of Incident: _____

Location of Incident: _____

Project Name: _____ Project Name: _____

Type of Incident* (check those that apply):

_____	"Near Miss"	_____	Vehicle Accident
_____	Underground Property Damage	_____	Fire
_____	Aboveground Property Damage	_____	Evacuation
_____	Chemical Exposure	_____	Regulatory Inspection
_____	Liner Penetration/Damage		
_____	Other (describe)	_____	

* Submit copy of Health & Safety Plan and Attachments for field-related incidents:

Description of Incident: _____

_____

Cause of Incident: _____

_____

Action Taken: _____

_____

Future Corrective Action: _____

_____

Estimated Amount of Damage: _____

_____

Investigator Name: _____ Signature: _____

Date: _____

ATTACHMENT 4

SITE INJURY/ILLNESS REPORT

ATTACHMENT 4

CASHIN TECHNICAL SERVICES, INC.

SITE INJURY/ILLNESS REPORT

(Use additional space as necessary)

Date of Incident _____ Case No. _____ Time of Day _____

Employee Name _____ Date of Birth _____

Home Address _____ Phone No. _____

Sex Male Female _____ Age _____ Job Title _____

Social Security No. _____ Office Location _____ Date of Hire _____

Where did incident occur? (include address) _____

_____

On employer's premises? Yes _____ No _____ Project Name/No. _____

What was employee doing when incident occurred? (Be specific) _____

_____

How did the incident occur? (describe fully) _____

_____

_____

_____

_____

What steps could be taken to prevent such an incident? _____

_____

_____

_____

Object or substance that directly caused incident: _____

_____

Describe the injury or illness _____

Part of body affected _____

Name and address of physician _____

If hospitalized, name and address of hospital _____

Loss of one or more days of work? Yes/No _____ If yes-date last worked _____

Has employee returned to work? Yes/No _____ If yes-date returned _____

Completed by (print) _____

(Site and Health and Safety Officer)

Signature _____ Employee Signature _____

Date _____ Date _____

This report must be completed by the employee's supervisor or Site Health and Safety Officer immediately upon learning of the incident.

APPENDIX VIII – SITE MANAGEMENT FORMS

BAYVILLE VILLAGE CLEANERS
290 BAYVILLE AVENUE
BAYVILLE, NEW YORK 11560
SUB-SLAB DEPRESSURIZATION SITE MANAGEMENT FORM

2017	Date	Yes	No	If No - Action Taken	Print Name of Inspector	Signature of Inspector
Discharge Pipe Clear of Obstruction	12/27/17	✓			MARC CALIFANO	M. Califano
General System Piping Inspection	12/27/17	✓			MARC CALIFANO	M. Califano
RadonAway Fan Running Properly	12/27/17	✓			MARC CALIFANO	M. Califano
RadonAway Alarm Operating Properly	12/27/17	✓			MARC CALIFANO	M. Califano
Negative Pressure Monitoring	12/27/17	✓			MARC CALIFANO	M. Califano
VOC PID Monitoring	12/27/17	✓			MARC CALIFANO	M. Califano
Ambient Air Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Influent Air Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Effluent Air Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Exterior Soil Vapor Gas Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Groundwater Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Replacement of Filter Media	12/27/17		✓	Not yet required No contamination breakthrough	MARC CALIFANO	M. Califano
Sanitary Leaching Pool Sampling	12/27/17	✓			MARC CALIFANO	M. Califano
Building Inventory Questionnaire	12/27/17	✓			MARC CALIFANO	M. Califano
2018						
Discharge Pipe Clear of Obstruction	5/18/18	✓			MARC CALIFANO	M. Califano
General System Piping Inspection	5/18/18	✓			MARC CALIFANO	M. Califano
RadonAway Fan Running Properly	Replaced ON 5/18/18				MARC CALIFANO	M. Califano
RadonAway Alarm Operating Properly	5/18/18	✓			MARC CALIFANO	M. Califano
Negative Pressure Monitoring	5/18/18	✓			MARC CALIFANO	M. Califano
VOC PID Monitoring						
Ambient Air Sampling						
Influent Air Sampling						
Effluent Air Sampling						
Exterior Soil Vapor Gas Sampling						
Groundwater Sampling						
Replacement of Filter Media	Replaced 4/28/18	✓			MARC CALIFANO	M. Califano
Sanitary Leaching Pool Sampling						
Building Inventory Questionnaire						
2019						
Discharge Pipe Clear of Obstruction						
General System Piping Inspection						
RadonAway Fan Running Properly						
RadonAway Alarm Operating Properly						
Negative Pressure Monitoring						
VOC PID Monitoring						
Ambient Air Sampling						
Influent Air Sampling						
Effluent Air Sampling						
Exterior Soil Vapor Gas Sampling						
Groundwater Sampling						
Replacement of Filter Media						
Sanitary Leaching Pool Sampling						
Building Inventory Questionnaire						

Summary of Green Remediation Metrics for Site Management

Site Name:_____Site Code: _____
Address:_____City: _____
State:_____ Zip Code:_____County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: _____

Current Reporting Period
Reporting Period From:_____To: _____

Contact Information
Preparer's Name: Phone No.: _____
Preparer's Affiliation: _

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR

I,_____(**Name**) do hereby certify that I am _____(**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application.

_____

Date **Contractor**

APPENDIX IX – OPERATION AND MAINTENANCE MANUAL

BAYVILLE VILLAGE CLEANERS
NYSDEC SITE NUMBER: V00220
290 BAYVILLE AVENUE
BAYVILLE, NASSAU COUNTY, NEW YORK 11560

SUB-SLAB DEPRESSURIZATION (SSD) SYSTEM OPERATION AND MAINTENANCE MANUAL

Prepared for:

Bayville Village Cleaners, Inc., Volunteer

Voluntary Cleanup Agreement: W1-0848-9903

Prepared by:

CASHIN TECHNICAL SERVICES, INC
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788
(631) 348-7600

MAY 2018

Table of Contents

Appendices:

1.0 Sub-Slab Depressurization System

1.1 Purpose

The purpose of this Operations and Maintenance (O&M) Manual document is to ensure the proper operation and maintenance of the active sub-slab depressurization (SSD) System installed at Bayville Village Cleaners, 290 Bayville Avenue, Bayville, New York 11560.

1.2 Site Operation and Maintenance Plan Requirements

This O&M Manual has been prepared for the subject Site by a Qualified Environmental Professional (QEF) to address in detail the institutional and engineering controls required for the Site.

Provisions covered by this O&M manual include the following:

- Parties responsible for implementation of the O&M Manual;
- Contact information to be posted at the Site;
- SSD System operation and maintenance requirements in accordance with most recent NYSDOH guidance document "*Guidance for Evaluating Soil Vapor Intrusion in the State of New York*" (dated October, 2006);
- Schedule of inspections and applicable testing in accordance with the approved Site Management Plan;
- Copies of all equipment manuals and product material guides.

A copy of the O&M Manual shall be maintained on-site and in the owner's office. Original inspection forms shall be maintained at the office of Thomas Ryan (Volunteer/Remedial Party).

2.0 Implementation of the Operations and Maintenance Manual

2.1 Remedial Parties Responsibility for Implementation of the O&M Manual

Thomas Ryan, Volunteer is responsible for operation and maintenance of the SSD System installed at Bayville Village Cleaners.

2.2 Contact Information

Name	Contact Information
Thomas Ryan, Volunteer 19 Todd Drive Glen Head, New York 11545	(516) 317-3183 tomykins40@hotmail.com
Marc Califano – Environmental Scientist Cashin Technical Services, Inc. 1200 Veterans Memorial Highway Hauppauge, NY 11788	(631) 348-7600 x41 mcalifano@ca-pc.com
NYSDEC Division of Environmental Remediation Project Manager **Jahan Reza, P.E.** NYSDEC – Region 1 50 Circle Road	(631) 444-0242 jahan.reza@dec.ny.gov
NYSDEC Regional Hazardous Waste Remediation Engineer **Walter J. Parish, P.E.** NYSDEC – Region 1 50 Circle Road Stony Brook, NY 11790 and Kelly Lewandowski, P.E. Chief, Site Control Section NYSDEC – Albany Central Office	(631) 444-0241 walter.parish@dec.ny.gov (518) 402-9569

2.3 Sub-Slab Depressurization System Description

The SSD system draws air and vapors from beneath the slab using negative pressure (vacuum) in the piping.

The SSD System includes the following components:

- A RadonAway fan (former Model GP501, newly installed Model RP265c) was installed to induce negative pressure to the sub-slab region beneath the one-story building.
- The extraction point for PCE vapors was installed in the center of the building, beneath the building slab, to capture all vapors.
- Interconnecting piping consisting of three and four-inch diameter schedule 40 PVC was utilized to install the SSD System. Four-inch PVC piping was installed from the sub-slab extraction point, extending to above the suspended ceiling, and then connected to the fan utilizing flexible couplings. The four-inch piping was then extended from the fan to the southern exterior wall. The piping then penetrates the wall whereby a reducer fitting extends three-inch PVC piping into a 55-gallon drum containing granular activated carbon (GAC). The GAC Vessel is located outside the building along the south side. The purpose of the GAC Vessel is to treat the effluent gas prior to discharge to the atmosphere through a three-inch exterior mounted stack pipe. Sampling/monitoring ports were installed on the extraction piping (influent side) and after the GAC vessel (effluent side) for monitoring vacuum, flow and contaminant concentrations.
- Air/vapor collection piping installed in a granular material beneath the building slab (4-inch diameter perforated PVC piping).

- A vapor barrier placed over the granular material and piping but beneath the floor slab to further inhibit the movement of PCE vapors from entering the ambient air space inside the subject building.
- Air/vapor collection piping (4-inch solid PVC piping) attached to the ceiling of the building to direct any vapors collected from beneath the slab to the exterior of the building utilizing a RadonAway Fan.
- Fan alarm to facilitate operation.

Appendix A to this document includes an as-built drawing showing the location of the fan, alarm device, collection piping, monitoring ports, sampling ports, and exhaust pipe.

Manufacturing and technical specification sheets for the SSD System of the SSD System fan (RadonAway) and the carbon adsorption media filter unit (Tetrasolv Filtration) are provided in Appendix B.

3.0 Maintenance

The SSD system needs little maintenance; however, several import activities should be performed annually. An annual inspection will be conducted by Bayville Village Cleaners consultant to inspect the active SSD System and ensure that it is functioning properly. The SSD system will be inspected annually at the time of vapor gas sampling. The following items will be inspected and recorded as part of the routine systems operation and maintenance.

1. Check the discharge of the system to be certain the openings are clear any obstructions such as insects or leaves.
2. Check the fan to confirm it is running smoothly. There should be consistent low level humming of the fan/motor. There should be no high pitched wining or screeching of the fan, the fan should be free of vibration, and the fan housing near the motor should not be hot to the touch. If these conditions are present the fan should be replaced immediately.
3. Check the functionality of the alarm device by disconnecting the air sample hose from the fan. The alarm should sound, if not the fan alarm should be replaced immediately.
4. The manometer reading will be checked to ensure that the fan is operating in the design range (extraction port).
5. Interior vacuum test point readings will be measured to ensure sub-slab depressurization.
6. The pipe supports will be checked to ensure they are secure.
7. The foundation sealing and sealing around system piping penetrations will be checked for any additional areas requiring sealing.
8. Replace the filter media (activated carbon) inside the VFD-55 Tetrasolv Filtration 55-gallon drum vessel (if necessary).
9. Properly dispose of the spent filter media (if necessary).

The completion of the activities outlined above should be recorded in the Site Management Inspection Form included in Appendix C of this document.

If the RadonAway fan or the RadonAway Checkpoint IIa system alarm fails or breaks during operation, replacement of these system components will be ordered and replaced immediately. If, during the sampling event, the interior vacuum test point readings do not show negative pressure, the fan may have to be upgraded to keep the building under negative pressure and ensure that sub-slab soil vapor gases are being drawn through the SSD System.

3.1 RadonAway Checkpoint IIa Radon System Alarm

The Radon Away fan is equipped with a pressure differential monitoring device (RadonAway Checkpoint IIa). This device is preset so no adjustment is needed and is designed to produce an audible alarm when pressure differential drops below the set point, thereby indicating loss of fan air/vapor flow. Factory settings are shown on the specification sheet included in Appendix B.

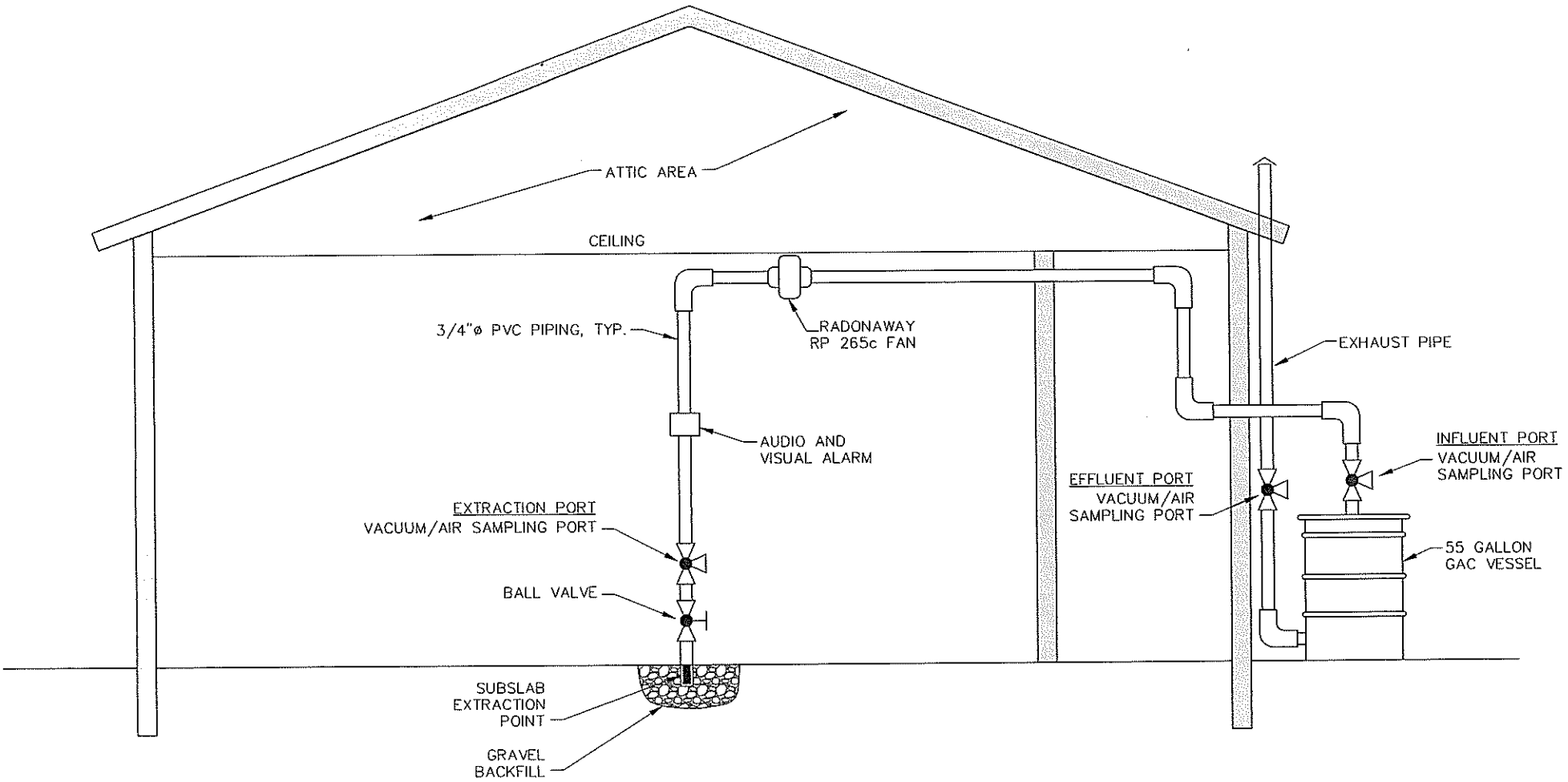
Should the power be lost to the building the fan will shut down and the alarm will initiate. Once power is restored to the building the alarm condition will be eliminated

The fan is powered by 120 volt circuits included in the lighting panels for the building. The fan should only be turned off for maintenance and service.

The SSD system has a warning devices to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted and the SSD system will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

APPENDIX A

AS-BUILT SSD SYSTEM DRAWING



AS-BUILT
SSDS SCHEMATIC

Bayville Village Cleaners
290 Bayville Avenue
Bayville, New York

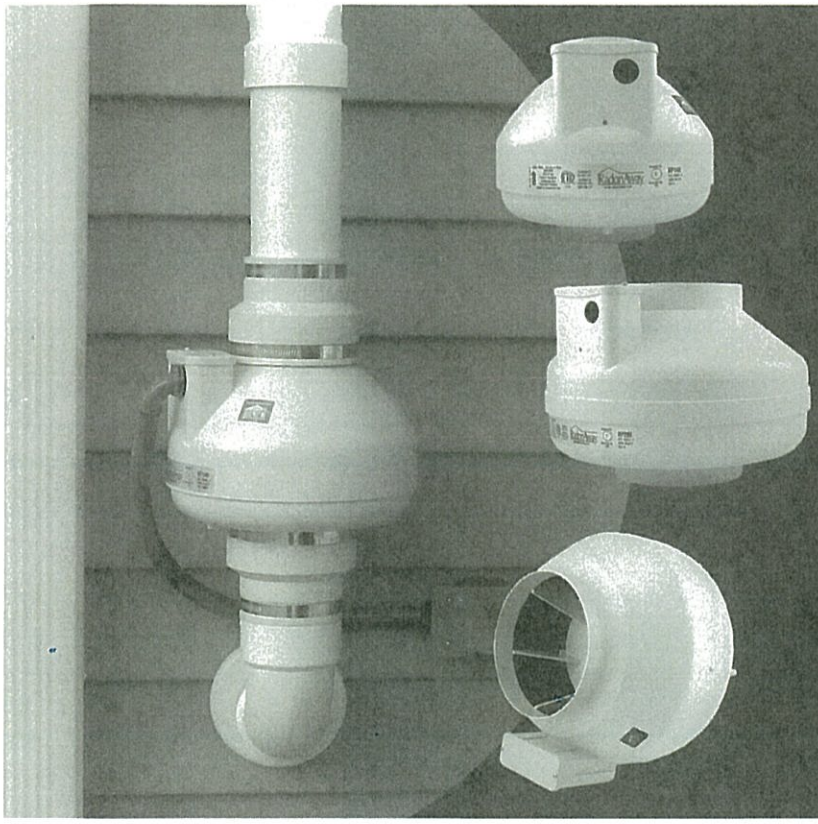
Cashin Associates, P.C.
ENGINEERING · PLANNING · CONSTRUCTION MANAGEMENT

APPENDIX B

Manufacturing and Technical Specification Sheets for the SSD System

RadonAway®
The world's leading radon fan manufacturer

RPc Series



Radon Mitigation Fan

All RadonAway® fans are specifically designed for radon mitigation. RPc Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140c & RP145c double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140c*	23029-1	4"	15-21	0.7	135	70	-	-	-
RP145c	23030-1	4"	41-72	1.7	166	126	82	41	3
RP260c	23032-1	6"	47-65	1.3	251	157	70	-	-
RP265c	23033-1	6"	91-129	2.2	334	247	176	116	52
RP380	28208	8"	95-152	2.0	497	353	220	130	38

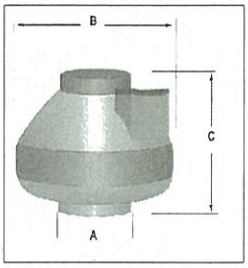
Made in USA with U.S. and imported parts.

ETL Listed

All RadonAway* inline radon fans are covered by our 5-year, hassle-free warranty.

Most Efficient 2017

*RP140c Only



Model	A	B	C
RP140c	4.5"	9.7"	8.5"
RP145c	4.5"	9.7"	8.5"
RP260c	6"	11.75"	8.6"
RP265c	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact Your Radon Professional:

Rev C 0517
P/N 02008

RadonAway®

The world's leading radon fan manufacturer

RP / RPc Series

Installation Instructions

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. See RadonAway.com/vapor-intrusion.

2. **NOTE:** Fan is suitable for use with solid state speed controls; however, use of speed controls is not generally recommended.

2. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

3. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

4. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.

5. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

6. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

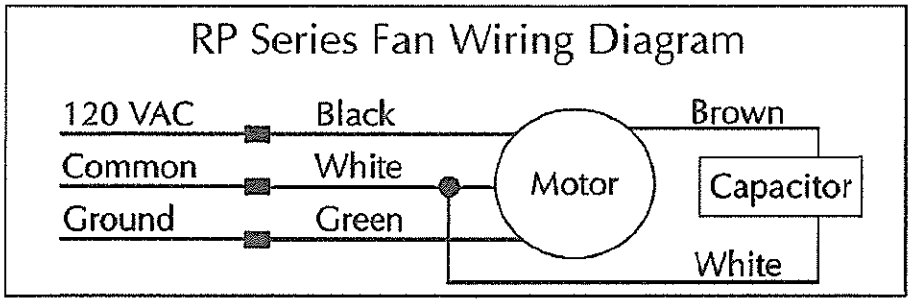
   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturers' guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) protected branch circuit.



1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The RP / RPc Series Radon Fans are intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of an RP / RPC Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The RP / RPc Series Fans are factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The RP / RPc Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F or more than 100 degrees F.

1.4 ACOUSTICS

The RP / RPc Series Fans, when installed properly, operate with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

[To ensure quiet operation of inline and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan(s). RP / RPc Series Fans are not suitable for kitchen range hood remote ventilation applications.]

1.5 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes, thus blocking air flow to the RP / RPc Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes, allowing for return to normal operation.

1.6 SLAB COVERAGE

The RP / RPc Series Fans can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP / RPc Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/140c and RP145/145c are best suited for general purpose use. The RP260/260c can be used where additional airflow is required, and the RP265/265c and RP380 are best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP / RPc Series Fan MUST be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP / RPc Series Fans are NOT suitable for underground burial.

For RP / RPc Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-

*Typical RP/RPc (except RP380/RP380c) Series Fan operational flow rate is 25 - 90 CFM on 3" and 4" pipe.(For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

1.8 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2, 28001-4 or 28421), should be provided and is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) with instructions for contacting the installing contractor for service and identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.9 VENTILATION

If used as a ventilation fan, any type of ducting is acceptable; however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air, for example, from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a "T" or "Y" fitting. Ideally, the duct should be arranged such that equal duct lengths are used between intake and "T" or "Y" fitting; this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems, then the opening on each grille should be equal in order to minimize noise and resistance. Straight smooth runs of rigid metal ducting will present the least resistance and maximize system performance. The Equivalent Length of Rigid Metal Ducting resulting in .2"WC pressure loss for each Fan Model is provided in the Specifications section of these instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance; recommended bend radius of elbow is at least 1.5 x duct diameter.

RP / RPc Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted farther away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction, preventing cold/hot draughts from entering the vented area and minimizing possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce backdraft dampers.

1.10 ELECTRICAL WIRING

The RP / RPc Series Fans operate on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.11 SPEED CONTROLS

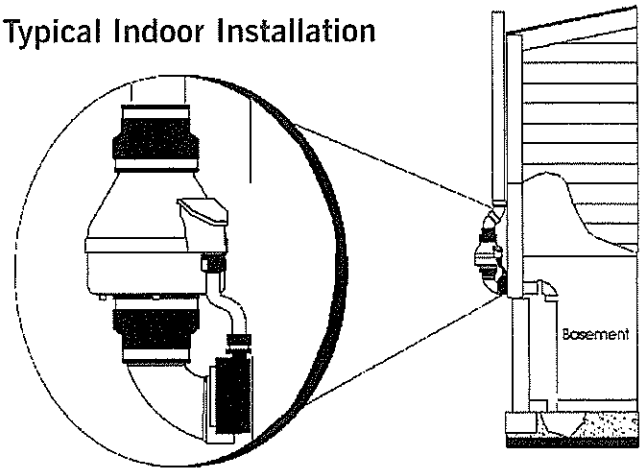
The RP / RPc Series Fans are rated for use with electronic speed controls; however, speed controls are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control.

2.0 INSTALLATION

The RP / RPc Series Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The RP / RPc Series Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.

For the ENERGY STAR Labeled RP140 / RP140c , the ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

Typical Indoor Installation



2.1 MOUNTING

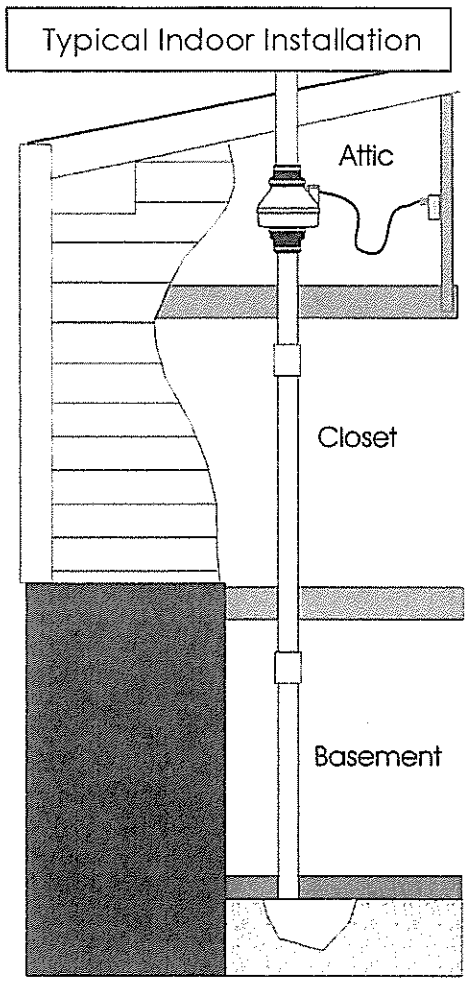
Mount the RP / RPc Series Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

The RP / RPc Series Fan may be optionally secured with the RadonAway mounting bracket (P/N 25007 or 25033 for RP380 only). Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.



2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10). Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

_____ **Verify** all connections are tight and **leak-free.**

_____ **Ensure** the RP / RPc Series Fan and all ducting are **secure and vibration-free.**

_____ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

RP / RPc Series Product Specifications

The following chart shows fan preformance for the RP / RPc Series Fans:

Typical CFM Vs. Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140/140c	135	103	70	14	-	-	-	-	
RP145/145c	166	146	126	104	82	61	41	21	3
RP260/260c	251	209	157	117	70	26	-	-	-
RP265/265c	334	291	247	210	176	142	116	87	52
RP380	531	490	415	340	268	200	139	84	41

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
RP140/140c	15 - 21 watts	0.7" WC
RP145/145c	41 - 72 watts	1.7" WC
RP260/260c	47-65 watts	1.4" WC
RP265/265c	91 - 129 watts	2.2" WC
RP380	96 - 138 watts	2.2" WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet	L.2
RP140/140c	8.5"H x 9.7" Dia.	5.5 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25
RP145/145c	8.5"H x 9.7" Dia.	5.5 lbs	4,5" OD	15
RP260/260c	8.6"H x 11.75" Dia.	5.5 lbs	6.0" OD	48
RP265/265c	8.6"H x 11.75" Dia.	6.5 lbs	6.0" OD	30
RP380	10.53"H x 13.41" Dia.	11.5 lbs	8.0" OD	57

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2" WC pressure loss (see CFM Vs Static Pressure "WC Table).

Recommended Ducting: RP/RPc Series Fans (excluding RP380), 3" or 4" Schedule 20/40 PVC Pipe;
RP380, 6" Schedule 20/40 PVC Pipe

PVC Pipe Mounting: If used for Ventilation, use 4", 6" or 8" Rigid or Flexible Ducting.
Mount on the duct pipe or with optional mounting bracket.

Storage Temperature Range: 32-100 degrees F

Thermal Cutout:

RP140/140c	130°C (266°F)
RP145/145c	150°C (302°F)
RP260/260c	150°C (302°F)
RP265/265c	150°C (302°F)
RP380	150°C (302°F))

Continuous Duty

Class F Insulation (RP140/RP140c Class B)

Thermally Protected Auto Reset

3000 RPM

Rated for Indoor or Outdoor Use

LISTED Electric Fan

Intertek 77728

Conforms to UL STD. 507

Certified to CAN/CSA STD. C22.2 No.113

ENERGY STAR RP140 Only

2100 HVI CERTIFIED

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RadonAway® RP/RPc, GP/GPc, XR/XRc, XP/XPc, XR and SF Series Fan for shipping damage within 15 days of receipt. **Notify RadonAway of any damages immediately.** RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open the housing.** Return unit to factory for service.

Install the RP/RPc, GP/GPc, XP/XPc, XR and SF Series Fan in accordance with all EPA, ANSI/AARST standard practices, and state and local building codes and regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

Warranty

RadonAway® warrants that the RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner (the "Warranty Term").

RadonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway®.

The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

5-YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to 60 months (5 years) from date of purchase or 66 months from date of manufacture, whichever is sooner, provided that the fan is installed by a professional radon mitigation contractor. Proof of purchase and/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the Continental United States and Canada beyond the standard 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner.

RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

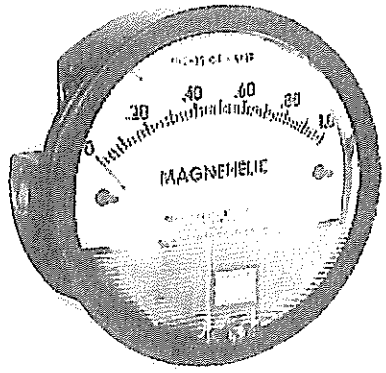
Record the following information for your records:

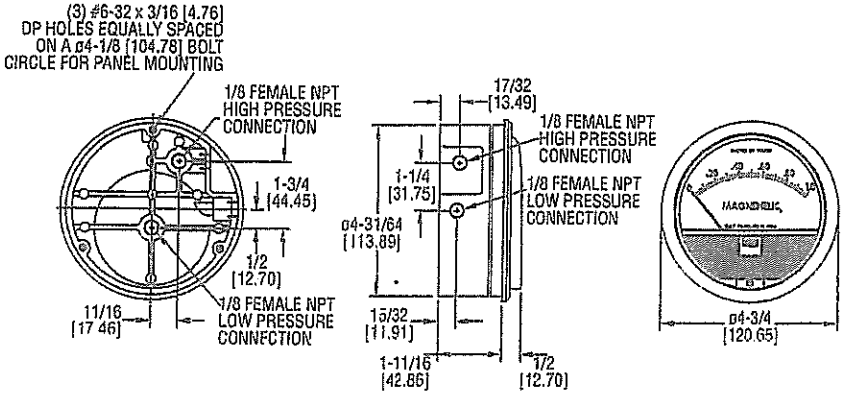
Serial Number: _____ Purchase Date: _____

Series 2000

Magnehelic® Differential Pressure Gages

Indicate Positive, Negative or Differential, Accurate within 2%





Dimensions, Standard Series 2000 Magnehelic® Pressure Gages. (Slightly different on medium and high pressure models)

Select the Dwyer® Magnehelic® gage for high accuracy – guaranteed within 2% of full scale – and for the wide choice of 81 models available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates low air or non-corrosive gas pressures – either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

The Magnehelic® guge is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

Note: May be used with Hydrogen. When ordering a Buna-N diaphragm pressures must be less than 35 psi.

Mounting

A single case size is used for most models of Magnehelic® gages. They can be flush or surface mounted with standard hardware supplied. With the optional A-610 Pipe Mounting Kit they may be conveniently installed on horizontal or vertical 1-1/4" - 2" pipe. Although calibrated for vertical position, many ranges above 1" may be used at any angle by simply re-zeroing. However, for maximum accuracy, they must be calibrated in the same position in which they are used. These characteristics make Magnehelic® gages ideal for both stationary and portable applications. A 4-9/16" hole is required for flush panel mounting. Complete mounting and connection fittings plus instructions are furnished with each instrument.

Flush...Surface... or Pipe Mounted

Vent Valves

In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

High and Medium Pressure Models

Installation is similar to standard gages except that a 4-13/16" hole is needed for flush mounting. The medium pressure construction is rated for internal pressures up to 35 psig and the high pressure up to 80 psig. Available for all models. Because of larger case, the medium pressure and high pressure models will not fit in a portable case size. Installation of the A-321 safety relief valve on standard Magnehelic® gages often provides adequate protection against infrequent overpressure.

SPECIFICATIONS

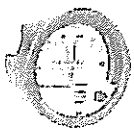
Service: Air and non-combustible, compatible gases. (Natural Gas option available.)
Wetted Materials: Consult factory.
Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy: ±2% of full scale (±3% on - 0, -100 Pa, -125 Pa, 10MM and ±4% on - 00, -60 Pa, -6MM ranges), throughout range at 70°F (21.1°C).
Pressure Limits: -20" Hg. to 15 psig.† (-0.677 bar to 1.034 bar); MP option: 35 psig (2.41 bar), HP option: 80 psig (5.52 bar).
Overpressure: Relief plug opens at approximately 25 psig (1.72 bar), standard gages only.
Temperature Limits: 20 to 140°F.* (-6.67 to 60°C).
Size: 4" (101.6 mm) Diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: 1/8" female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight: 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (983 g).
Standard Accessories: Two 1/8" NPT plugs for duplicate pressure taps, two 1/8" pipe thread to rubber tubing adapter and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for 3 adapters in MP & HP gage accessories.)

*Low temperature models available as special option.
†For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options at lower left.

OPTIONS AND ACCESSORIES

Transparent Overlays
Furnished in red and green to highlight and emphasize critical pressures.

Adjustable Signal Flag
Integral with plastic gage cover. Available for most models except those with medium or high pressure construction. Can be ordered with gage or separate.

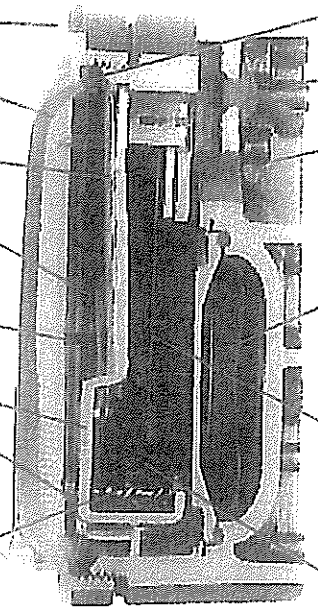


LED Setpoint Indicator
Bright red LED on right of scale shows when setpoint is reached. Field adjustable from gage face, unit operates on 12-24 VDC. Requires MP or HP style cover and bezel.

A-432 Portable Kit
Combine carrying case with any Magnehelic® gage of standard range, except high pressure connection. Includes 9 ft (2.7 m) of 3/16" I.D. rubber tubing, standhang bracket and terminal tube with holder.

A-605 Air Filter Gage Accessory Kit
Adapts any standard Magnehelic® gage for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft (1.5 m) lengths of 1/4" aluminum tubing two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves.

Quality design and construction features



Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

Precision litho-printed scale is accurate and easy to read.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

Pointer stops of molded rubber prevent pointer over-travel without damage.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Jeweled bearings are shock-resistant mounted, provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Zero adjustment screw is conveniently located in the plastic cover, and is accessible without removing cover. O-ring seal provides pressure tightness.

Helix is precision made from an alloy of high magnetic permeability. Mounted in jeweled bearings, it turns freely, following the magnetic field to move the pointer across the scale.

O-ring seal for cover assures pressure integrity of case.

Blowout plug of silicone rubber protects against overpressure on 15 psig rated models. Opens at approximately 25 psig.

Die cast aluminum case is precision made and iridite-dipped to withstand 168 hour salt spray corrosion test. Exterior finished in baked dark gray hammerloid. One case size is used for all standard pressure options, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded O-ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Calibrated range spring is flat spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

Samarium Cobalt magnet mounted at one end of range spring rotates helix without mechanical linkages.

Series 2000 Magnehelic® Gage — Models and Ranges
Page V shows examples of special models built for OEM customers. For special scales furnished in ounces per square inch, inches of mercury, metric units, square root scales for volumetric flow, etc., contact the factory.

Model	Range Inches of Water
2000-00N†••	.05-0-.2
2000-00†••	0-.25
2000-0†•	0-.50
2001	0-1.0
2002	0-2.0
2003	0-3.0
2004	0-4.0
2005	0-5.0
2006	0-6.0
2008	0-8.0
2010	0-10
2012	0-12
2015	0-15
2020	0-20
2025	0-25
2030	0-30
2040	0-40
2050	0-50
2060	0-60
2080	0-80
2100	0-100
2120	0-120
2150	0-150
2160	0-160
2180	0-180
2250	0-250
Zero Center Ranges	
2300-00†••	0.125-0-0.125
2300-0†•	.25-0-.25
2301	.5-0-.5
2302	1-0-1
2304	2-0-2
2310	5-0-5
2320	10-0-10
2330	15-0-15

Model	Range PSI
2201	0-1
2202	0-2
2203	0-3
2204	0-4
2205	0-5
2210*	0-10
2215*	0-15
2220*	0-20
2230**	0-30

Model	Range, CM of Water
2000-15CM	0-15
2000-20CM	0-20
2000-25CM	0-25
2000-50CM	0-50
2000-80CM	0-80
2000-100CM	0-100
2000-150CM	0-150
2000-200CM	0-200
2000-250CM	0-250
2000-300CM	0-300
Zero Center Ranges	
2300-4CM	2-0-2
2300-10CM	5-0-5
2300-30CM	15-0-15

†These ranges calibrated for vertical scale position.
• Accuracy +/-3%
•• Accuracy +/-4%
*MP option standard
**HP option standard

Model	Range MM of Water
2000-6MM†••	0-6
2000-10MM†•	0-10
2000-15MM	0-15
2000-25MM	0-25
2000-30MM	0-30
2000-50MM	0-50
2000-80MM	0-80
2000-100MM	0-100
2000-125MM	0-125
2000-150MM	0-150
2000-200MM	0-200
2000-250MM	0-250
2000-300MM	0-300
Zero Center Ranges	
2300-6MM†••	3-0-3
2300-10MM†•	5-0-5
2300-20MM†•	10-0-10
Model	Range, Pa
2000-60NPA†••	10-0-50
2000-60PA†••	0-60
2000-100PA†•	0-100
2000-125PA†•	0-125
2000-250PA	0-250
2000-300PA	0-300
2000-500PA	0-500
2000-750PA	0-750
2000-1000PA	0-100 x 10
Zero Center Ranges	
Model	Range, Pa
2300-60PA†••	30-0-30
2300-100PA†•	50-0-50
2300-120PA	60-0-60
2300-200PA	100-0-100
2300-250PA	125-0-125
2300-300PA	150-0-150
2300-500PA	250-0-250
2300-1000PA	500-0-500

Model	Range, kPa
2000-0.5KPA	0-0.5
2000-1KPA	0-1
2000-1.5KPA	0-1.5
2000-2KPA	0-2
2000-2.5KPA	0-2.5
2000-3KPA	0-3
2000-4KPA	0-4
2000-5KPA	0-5
2000-6KPA	0-6
2000-10KPA	0-10
2000-15KPA	0-15
2000-20KPA	0-20
2000-25KPA	0-25
2000-30KPA	0-30
Zero Center Ranges	
2300-1KPA	.5-0-.5
2300-2KPA	1-0-1
2300-2.5KPA	1.25-0-1.25
2300-3KPA	1.5-0-1.5

Dual Scale Air Velocity Units
For use with pitot tube

Model	Range in W.C./ Velocity F.P.M.
2000-00AV†••	0-.25/300-2000
2000-0AV†•	0-.50/500-2800
2001AV	0-1.0/500-4000
2002AV	0-2.0/1000-5600
2005AV	0-5.0/2000-8800
2010AV	0-10/2000-12500

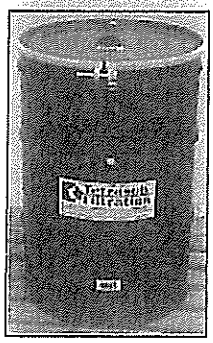
Dual Scale English/Metric Models

Model	Range, In. W.C.	Range, Pa or kPa
2000-OOD†••	0-.25	0-62 Pa
2000-OD†•	0-0.5	0-125 Pa
2001D	0-1.0	0-250 Pa
2002D	0-2.0	0-500 Pa
2003D	0-3.0	0-750 Pa
2004D	0-4.0	0-1.0 kPa
2005D	0-5.0	0-1.25 kPa
2006D	0-6.0	0-1.5 kPa
2008D	0-8.0	0-2.0 kPa
2010D	0-10	0-2.5 kPa
2015D	0-15	0-3.7 kPa
2020D	0-20	0-5 kPa
2025D	0-25	0-6.2 kPa
2050D	0-50	0-12.4 kPa
2060D	0-60	0-15 kPa

ACCESSORIES
A-299, Surface Mounting Bracket
A-300, Flat Flush Mounting Bracket
A-310A, 3-Way Vent Valve
A-321, Safety Relief Valve
A-432, Portable Kit
A-448, 3-piece magnet kit for mounting Magnehelic® gage directly to magnetic surface
A-605, Air Filter Kit
A-610, Pipe Mount Kit

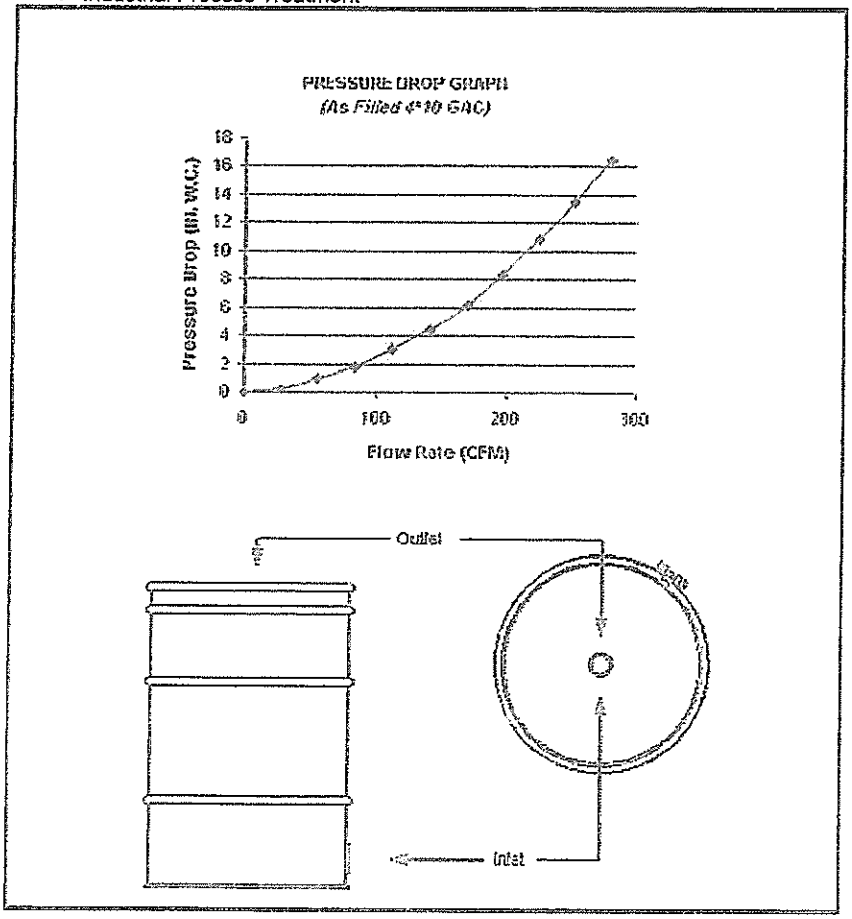
OPTIONS — To order, add suffix: I.E. 2001-ASF
ASF, Adjustable Signal Flag
HP, High Pressure Option
LT, Low Temperatures to -20°F
MP, Med. Pressure Option
SP, Setpoint Indicator
Scale Overlays, Red, Green, Mirrored or Combination, Specify Locations

VFD SERIES FILTERS
MODEL VFD-55



The VFD-55 filter is a media filter vessel designed to treat vapor streams. While the typical design application is a activated carbon adsorbtion unit, the filter can easily accommodate many medias. The sturdy construction makes these filter vessels ideal for long term treatment units. Some applications include:

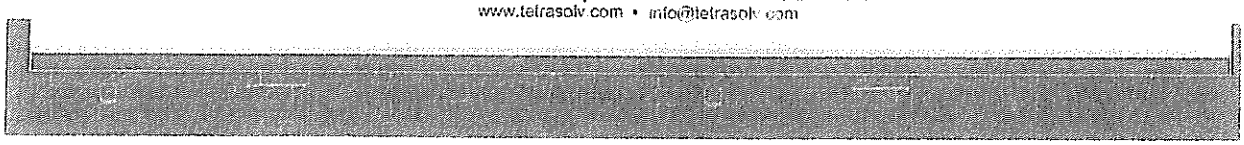
- Soil Vapor Extraction Treatment
- Air Stripper Off Gas Treatment
- Odor Removal System
- Storage Tank Purge Vapor Treatment
- Pilot Study
- Industrial Process Treatment



VFD-55 SPECIFICATIONS

Overall Height	2'10"	Vessel/Internal Piping Materials	CS/CS (False Floor)
Diameter	23"	Internal Coating	Polyamide Epoxy Resin
Inlet / Outlet (FNPT)	2"	External Coating	Urethane Enamel
Drain / Vent (FNPT)	OPT	Maximum Pressure / Temp	4 PSIG / 250° F
GAC Fill (lbs)	175	Cross Sectional Bed Area	2.8 FT^2
Shipping / Operational Weight (lbs)	225/300	Bed Depth/Volume	2.2 FT / 6.3 FT^3

Tetrasolv Filtration, Inc. • 1200 East 26th Street • Anderson, Indiana 46016 • USA
Toll Free: 800-441-4034 Telephone: 765-643-3941 • Fax: 765-643-3949
www.tetrasolv.com • info@tetrasolv.com



APPENDIX C

Site Management Inspection Form

BAYVILLE VILLAGE CLEANERS
290 BAYVILLE AVENUE
BAYVILLE, NEW YORK 11560
SUB-SLAB DEPRESSURIZATION SITE MANAGEMENT FORM

2017	Date	Yes	No	If No - Action Taken	Print Name of Inspector	Signature of Inspector
Discharge Pipe Clear of Obstruction	12/27/17	✓			MARC CALTIANO	M. Caltiano
General System Piping Inspection	12/27/17	✓			MARC CALTIANO	M. Caltiano
RadonAway Fan Running Properly	12/27/17	✓			MARC CALTIANO	M. Caltiano
RadonAway Alarm Operating Properly	12/27/17	✓			MARC CALTIANO	M. Caltiano
Negative Pressure Monitoring	12/27/17	✓			MARC CALTIANO	M. Caltiano
VOC PID Monitoring	12/27/17	✓			MARC CALTIANO	M. Caltiano
Ambient Air Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Influent Air Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Effluent Air Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Exterior Soil Vapor Gas Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Groundwater Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Replacement of Filter Media	12/27/17		✓	Not yet required No contamination breakthrough	MARC CALTIANO	M. Caltiano
Sanitary Leaching Pool Sampling	12/27/17	✓			MARC CALTIANO	M. Caltiano
Building Inventory Questionnaire	12/27/17	✓			MARC CALTIANO	M. Caltiano
2018						
Discharge Pipe Clear of Obstruction	5/18/18	✓			MARC CALTIANO	M. Caltiano
General System Piping Inspection	5/18/18	✓			MARC CALTIANO	M. Caltiano
RadonAway Fan Running Properly	Replaced ON 5/18/18				MARC CALTIANO	M. Caltiano
RadonAway Alarm Operating Properly	5/18/18	✓			MARC CALTIANO	M. Caltiano
Negative Pressure Monitoring	5/18/18	✓			MARC CALTIANO	M. Caltiano
VOC PID Monitoring						
Ambient Air Sampling						
Influent Air Sampling						
Effluent Air Sampling						
Exterior Soil Vapor Gas Sampling						
Groundwater Sampling						
Replacement of Filter Media Replaced	4/28/18	✓			MARC CALTIANO	M. Caltiano
Sanitary Leaching Pool Sampling						
Building Inventory Questionnaire						
2019						
Discharge Pipe Clear of Obstruction						
General System Piping Inspection						
RadonAway Fan Running Properly						
RadonAway Alarm Operating Properly						
Negative Pressure Monitoring						
VOC PID Monitoring						
Ambient Air Sampling						
Influent Air Sampling						
Effluent Air Sampling						
Exterior Soil Vapor Gas Sampling						
Groundwater Sampling						
Replacement of Filter Media						
Sanitary Leaching Pool Sampling						
Building Inventory Questionnaire						

APPENDIX X – REMEDIAL SYSTEM OPTIMIZATION TABLE OF CONTENTS

THIS DOCUMENT IS NOT REQUIRED AT THE PRESENT TIME

TABLE OF CONTENTS OUTLINE

APPENDIX XI – AGENCY APPROVAL DOCUMENTS INCLUDING THE EXECUTED VCA AND ITS AMENDMENTS

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region One
Stony Brook University
50 Circle Road, Stony Brook, New York 11790-3409
Phone: (631) 444-0240 • **Fax:** (631) 444-0248
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

October 27, 2009

Mr. Thomas Ryan
19 Todd Drive
Glen Head, NY 11545

Re: Bayville Village Cleaners Site #V00220
Voluntary Cleanup Agreement Index #W1-0848-9903
Site Investigation Report: December 9, 2008
Site Investigation Report Addendum: August 3, 2009

Dear Mr. Ryan,

The New York State Department of Environmental Conservation has reviewed the referenced reports and has determined that they substantially address the requirements of the referenced voluntary cleanup agreement and the site investigation work plan dated May 17, 2007. The site investigation reports are hereby approved.

If you should have any questions, please feel free to contact me at (631) 444-0246.

Sincerely,

Jamie Ascher
Engineering Geologist 2

cc: C. Vasudevan
M. Lesser
W. Parish
S. Shearer
R. Ockerby

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region One
Stony Brook University
50 Circle Road, Stony Brook, New York 11790-3409
Phone: (631) 444-0240 • **Fax:** (631) 444-0248
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

cc: JMH
PAB

January 6, 2010

Mr. Thomas Ryan
19 Todd Drive
Glen Head, NY 11545

Re: Bayville Village Cleaners Site #V00220
Voluntary Cleanup Agreement Index #W1-0848-9903
Site Investigation Report: December 2008
Site Investigation Report Addendum: August 2009

Dear Mr. Ryan,

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the referenced reports and concur with the recommendations presented in Section 9.0 of the August 2009 report. As such, please submit a remedial action work plan stamped and signed by a NYS licensed Professional Engineer for the construction of a vapor mitigation system.

Nothing contained herein represents a waiver by the Department of any rights held under the voluntary cleanup agreement (VCA) or applicable state and federal law or any rights held under the same or a release for any party from any obligations held under the VCA or those laws. If you should have any questions, please feel free to contact me at (631) 444-0246.

Sincerely,

Jamie Ascher
Engineering Geologist 2

cc: C. Vasudevan, NYSDEC
M. Lesser, NYSDEC
W. Parish, NYSDEC
S. Shearer, NYSDOH
R. Ockerby, NYSDOH
J. DeFranco, NCDH
P. Brighton, Walden Associates

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region One
Stony Brook University
50 Circle Road, Stony Brook, New York 11790-3409
Phone: (631) 444-0240 • **Fax:** (631) 444-0248
Website:

Joe Martens
Commissioner

August 15, 2011

Mr. Joseph M. Heaney III, P.E.
Walden Associates
16 Spring Street
Oyster Bay, NY 11771

Re: Voluntary Cleanup Project
Remedial Action Work Plan: April 2011
Bayville Village Cleaners #V00220

Dear Mr. Heaney,

The Department has completed its review of the Remediation Work Plan for the subject site. Based upon the information and representations given in the Work Plan and previous investigation reports dated December 2006, December 2008 and August 2009, the Work Plan is hereby approved. The Work Plan consists of the Revised Remedial Action Work Plan dated April 2011 prepared by Walden Associates.

Please contact Mr. Jamie Ascher of my staff at (631) 444-0246 at your earliest convenience to discuss scheduling the field activities associated with the approved plan.

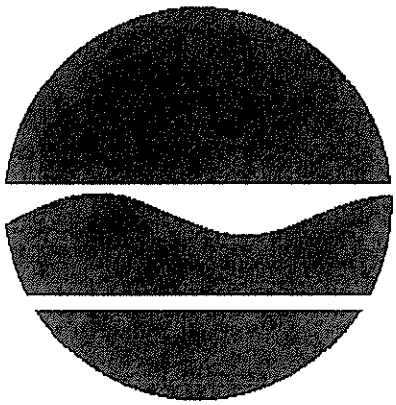
Sincerely,

Walter J. Parish, P.E.
Regional Hazardous Waste Remediation Engineer

cc: J. Harrington, P.E., NYSDEC
A.Tamuno, Esq., NYSDEC
C. Bethoney, NYSDOH
R. Ockerby, NYSDOH
J. Ascher, NYSDEC
P. Brighton, Walden Associates

DECISION DOCUMENT

Bayville Village Cleaners
Voluntary Cleanup Program
Bayville, Nassau County
Site No. V00220
August 2011



Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Bayville Village Cleaners
Voluntary Cleanup Program
Bayville, Nassau County
Site No. V00220
August 2011

Statement of Purpose and Basis

This document presents the remedy for the Bayville Village Cleaners site, a voluntary cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and applicable guidance.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Bayville Village Cleaners site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the remedy are as follows:

1) Installation of a sub-slab depressurization system within the facility building. A fan will be connected to one extraction point within the building. Four vacuum test points will be installed within the facility to ensure negative pressure is attained beneath the entire building slab. Additional extraction points can be added, if necessary. Five permanent exterior soil vapor points will be constructed outside the building to monitor the system's effectiveness in capturing/containing soil gas. Although no permit is required, a DAR-1 (Air Guide 1) analysis will be performed. Process exhaust will be routed through a vessel filled with granular activated carbon to remove contaminants prior to discharge to the atmosphere.

2) Imposition of an institutional control in the form of a deed restriction for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Nassau County DOH;

d. prohibits agriculture or vegetable gardens on the controlled property; and

e. requires compliance with the Department approved Site Management Plan;

3) A Site Management Plan is required, which includes the following:

a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Deed Restriction discussed in Paragraph 2 above.

Engineering Controls: The sub-slab depressurization system discussed in Paragraph 1 above.

This plan includes, but may not be limited to:

i. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

ii. descriptions of the provisions of the deed restrictions including any land use, and/or groundwater and/or surface water use restrictions;

iii. a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion.

iv. provisions for the management and inspection of the identified engineering controls;

v. maintaining site access controls and Department notification; and

vi. the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

i. monitoring of the subslab depressurization system to assess the performance and effectiveness of the remedy;

ii. a schedule of monitoring and frequency of submittals to the Department;

iii. monitoring for vapor intrusion for any additional buildings developed on the site, as may be required pursuant to item 1 above.

4) Green remediation principals and techniques will be implemented to the extent feasible in the site management of the remedy as per DER-31. The major green remediation components are as follows;

i. Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

ii. Reducing direct and indirect greenhouse gas and other emissions;

iii. Increasing energy efficiency and minimizing use of non-renewable energy;

iv. Conserving and efficiently managing resources and materials;

v. Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

August 11, 2011

Date

James B. Harrington, P.E., Director
Remedial Bureau A

DECISION DOCUMENT

Bayville Village Cleaners
Bayville, Nassau County
Site No. V00220
August 2011

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The Voluntary Cleanup Program (VCP) is a voluntary program. The goal of the VCP is to enhance private sector cleanup of brownfields by enabling parties to remediate sites using private rather than public funds and to reduce the development pressures on "greenfields." This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: SITE DESCRIPTION AND HISTORY

Site Location: Bayville Village Dry Cleaners is located at the southeast corner of Bayville Avenue and 17th Street in the Village of Bayville, Town of Oyster Bay, Nassau County.

Site Features: The site is approximately 0.25 acres in size and consists of a single story masonry building that is 1,440 sq/ft in size. The facility is still being utilized as a commercial dry cleaner although it no longer uses tetrachloroethylene (PCE) as part of its dry cleaning process.

Current Zoning/Use(s): The parcel is zoned for commercial use. Surrounding land uses include mixed commercial and residential.

Historical Use(s) and Source(s) of Contamination: It is believed that repeated discharges of PCE contaminated condensate to the ground surface on the west side of the building led to the contamination of subsurface soil and groundwater. Prior to entering the Voluntary Cleanup Program, the affected area was excavated and 67.76 tons of contaminated soil was removed and disposed of off-site at a permitted disposal facility.

Site Geology/Hydrogeology: Subsurface soil is composed mainly of fine/silty sand transitioning to coarse sand 6' below grade. The water table is encountered approximately 8' to 10' below land surface, depending on seasonal fluctuation. The site specific groundwater flow direction is to the

north.

A site location map is attached as Figure 1.

SECTION 3: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, at a minimum, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in DER-10, Technical Guidance for Site Investigation and Remediation were/was evaluated.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 4: ENFORCEMENT STATUS

The voluntary cleanup agreement is with a responsible party. The agreement requires the party to address on-site and off-site contamination. Accordingly, no enforcement actions are necessary.

SECTION 5: SITE CONTAMINATION

5.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 5.4.

5.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or

that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

5.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

tetrachloroethylene (pce) trichloroethene (tce)

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor
- indoor air

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

5.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

People are not drinking or coming into contact with the contaminated groundwater because the area is served by a public water supply that is not contaminated by the site. Contact with residual soil contamination is not likely because the site is covered with pavement and a building. Volatile organic compounds in the soil may move into the soil vapor (air spaces within the soil) which in turn may move into overlying buildings and affect indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The potential for soil vapor intrusion to affect indoor air quality of the on-site building exists. A sub-slab depressurization system (SSDS) is being designed for installation in the on-site building. The SSDS will prevent indoor air quality from being affected by the contamination in soil vapor beneath the building. The potential exists for off-site soil vapor migration.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination: The main contaminant of concern at the site is tetrachloroethylene (PCE). The impacted media are soil, groundwater, indoor air and soil gas. To a lesser extent, the degradation product trichloroethene has been detected in groundwater and soil gas.

SCG soil exceedances exists for PCE in multiple sample locations. In May 1995, soil sampling conducted under the oversight of the Nassau County Department of Health (NCDH) found PCE concentrations as high 36,000 ppm in surface soil (0-6 inches) collected by an evaporator pipe located outside the west side of the building. An additional 11 surface and subsurface soil samples were collected in 1996 under NCDH oversight which revealed PCE concentrations ranging from 0.130 ppm to 11,000 ppm. PCE concentrations generally diminished with depth. These sample results were compared to the recommended soil cleanup objective for PCE of 1.4 ppm in TAGM #4046.

In 1996, prior to entering the Voluntary Cleanup Program, the affected area was excavated and 67.76 tons of contaminated soil was disposed of at a permitted disposal facility. 17 post excavation confirmatory soil samples were collected with residual PCE concentrations ranging from non-detect (ND) to 0.620 ppm. In February 2008, under the VCP, eight supplemental soil samples were collected from the former source area with PCE concentrations in the range of ND to 0.016 ppm in the former source area. The Protection of Groundwater SCO for PCE is 1.3 ppm.

In 1996, groundwater samples were collected at the water table at eight on-site locations. PCE concentrations ranged from ND to 8,600 ppb. The NYS Groundwater Water Standard for PCE is 5 ppb. However, as a result of source removal, PCE levels in 2007 were found to have

diminished significantly (ND to 6.4 ppb). In 2008, groundwater samples were collected at four on-site locations via geoprobe at 25' and 50' below grade. PCE was ND in all samples.

In 2009, PCE was detected in indoor air sampling at 65 ug/m3. The NYSDOH action level for PCE in indoor air is 100 ug/m3. The dry cleaners no longer uses PCE in their dry cleaning process.

Sub-slab soil gas was sampled twice, in 2008 and 2009, and revealed PCE levels at 2,500 ug/m3 and 2,200 ug/m3, respectively. The NYSDOH action level for mitigation of PCE in sub-slab soil gas is 1,000 ug/m3. Exterior soil gas was sampled at five locations outside the building and revealed PCE in the range of 880 ug/m3 to 2,000 ug/m3. Exterior soil gas will be evaluated when the mitigation system is operational to determine if any off-site soil vapor sampling is warranted.

SECTION 6: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and evaluation of the remedial criteria are present in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation.

The elements of the selected remedy, as shown in Figure 2, are as follows:

1) Installation of a sub-slab depressurization system within the facility building. A fan will be connected to one extraction point within the building. Four vacuum test points will be installed within the facility to ensure negative pressure is attained beneath the entire building slab. Additional extraction points can be added, if necessary. Five permanent exterior soil vapor points will be constructed outside the building to monitor the system's effectiveness in capturing/containing soil gas. Although no permit is required, a DAR-1 (Air Guide 1) analysis will be performed. Process exhaust will be routed through a vessel filled with granular activated carbon to remove contaminants prior to discharge to the atmosphere.

2) Imposition of an institutional control in the form of a deed restriction for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Nassau County DOH;

d. prohibits agriculture or vegetable gardens on the controlled property; and

e. requires compliance with the Department approved Site Management Plan;

New York State Department of Environmental Conservation

FACT SHEET

Voluntary Cleanup Program

Bayville Village Cleaners
#V00220
Bayville, NY

April 2011

Remedy Proposed for Voluntary Cleanup Program Site Contamination; Public Comment Period Announced

The public is invited to comment on a proposed remedy being reviewed by the New York State Department of Environmental Conservation (NYSDEC) to address contamination related to Bayville Village Cleaners ("site") located at 290 Bayville Road in Bayville, Nassau County. See map for site location.

The Proposed Remedy

The remedy proposed for the site includes the construction of a sub-slab depressurization system within the site building to capture soil vapors beneath the building. The volunteer and Walden Associates developed the proposed remedy after performing a detailed investigation of the site under New York's Voluntary Cleanup Program.

The proposed remedy is described in a draft cleanup plan called a "Remedial Action Work Plan." The document is available for review at the locations identified below under "Where to Find Information."

How to Comment

NYSDEC is accepting written public comments about the proposed remedy for 30 days, from May 4, 2011 through June 2, 2011.

Submit written comments to:

Mr. Jamie Ascher
New York State Department of Environmental Conservation
SUNY @ Stony Brook
50 Circle Road, Stony Brook NY 11790
[illegible]

Voluntary Cleanup Program: New York's Voluntary Cleanup Program (VCP) was developed to encourage private sector volunteers to investigate and clean up contaminated properties and return these sites to productive use. Once cleaned up, the properties may be redeveloped for commercial, industrial, residential or public use.

For more information about the VCP, visit: [illegible]

Summary of the Proposed Remedy

Prior to entering the Voluntary Cleanup Program, the volunteer removed 68 tons of contaminated soil from

the site. This soil was disposed of at a permitted disposal facility. As a result of this remedial action, the concentration of contaminants in groundwater has diminished. However, concentrations of dry cleaning fluid in subsurface soil gas are at levels which, when compared to the New York State Department of Health's (NYSDOH) action levels, triggers the need for action. The volunteer is proposing to use a technology called "sub-slab depressurization" which has been successfully employed at many sites to mitigate soil vapor intrusion. A blower motor is used to vacuum soil vapors from the subsurface. When the system has been constructed, it will be tested to ensure that it is effective in capturing soil vapors. Contaminated soil vapors will pass through a carbon canister to remove pollutants before the air is returned to the atmosphere. After the remedy is constructed a site management plan will be prepared for the operation, maintenance and monitoring of the system.

Next Steps

NYSDEC will consider public comments, revise the plan as necessary, and approve the proposed remedy. The NYSDOH must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The draft Remedial Action Work Plan that describes the proposed remedy is revised as needed to describe the selected remedy, and will be made available to the public (see "Where to Find Information" below). The volunteer may then perform the cleanup action to address the site contamination, with oversight by NYSDEC. NYSDEC will keep the public informed during the cleanup of the site.

Background

NYSDEC previously accepted an application from the volunteer to participate in the Voluntary Cleanup Program. The application proposes that the site will be used for commercial purposes. The site is approximately 0.25 acres in size and continues to be operated as a commercial dry cleaners. Under the Voluntary Cleanup Program, prior to the preparation of the draft Remedial Action Work Plan, a site investigation was performed which evaluated soil, soil gas, indoor air and groundwater quality.

FOR MORE INFORMATION

Where to Find Information

Project documents are available at the following locations to help the public stay informed. These documents include the draft cleanup plan (draft Remedial Action Work Plan).

Bayville Free Library
34 School Street
Bayville, NY 11709
(516) 628-2765
Monday-Thursday 10am-9pm
Friday 10am-5pm
Saturday 10am-1pm

NYSDEC-Region 1
SUNY @ Stony Brook
50 Circle Road
Stony Brook, NY 11790
Monday-Friday 8:30am-4:45pm

Who to Contact

Comments and questions are always welcome and should be directed as follows:

Project Related Questions
Mr. Jamie Ascher
New York State Department of
Environmental Conservation
SUNY @ Stony Brook
50 Circle Road
(631) 444-0240
jyascher@gw.dec.state.ny.us

Site-Related Health Questions
Ms. Renata Ockerby
New York State Department of Health
Flanigan Square – 547 River Street
Troy, NY 12180
(518) 402-7880
[illegible]@health.state.ny.us

We encourage you to share this fact sheet with neighbors and tenants, and/or post this fact sheet in a prominent area of your building for others to see.

Receive Site Fact Sheets by Email

Have site information such as this fact sheet sent right to your email inbox. NYSDEC invites you to sign up with one or more contaminated sites county email listservs available at the following web page: [illegible]. It's *quick*, it's *free*, and it will help keep you *better informed.*

As a listserv member, you will periodically receive site-related information/announcements for all contaminated sites in the county(ies) you select.

You may continue also to receive paper copies of site information for a time after you sign up with a county listserv, until the transition to electronic distribution is complete.

Note: Please disregard if you already have signed up and received this fact sheet electronically.

SITE LOCATION PLAN

Bayville Village Cleaners
290 Bayville Ave, Bayville, NY 11079
Figure 1

0 20 40 80 120 160
Feet

New York State Department of Environmental Conservation
Division of Environmental Enforcement
State Superfund and Voluntary Cleanup Bureau
Eastern Field Unit
200 White Plains Road, 5th Floor
Tarrytown, New York 10591-5805
Telephone: (914) 332-1835
Fax (914)332-5116 (not for service of process)

John P. Cahill
Commissioner

December 1, 1999

Andrew Levitt, Esq.
Farrell Fritz
EAB Plaza
Uniondale, NY 11556-0120

Re: Bayville Village Cleaners
Index No. W1-0848-9903

Dear Mr. Levitt:

Enclosed is a fully executed voluntary agreement for the investigation of the site above referenced. Please forward the agreement to your client for implementation. Please feel free to contact me with any comments or questions you may have.

Thank you for your time and attention.

Very truly yours,

Edward F. Devine
Division of Environmental Enforcement

cc: J. Ascher

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the
Implementation of an
Investigation of
290 Bayville Avenue,
by

Bayville Village Cleaners, Inc.
Volunteer.

AGREEMENT

INDEX NUMBER: W1-0848-9903

DEFINITIONS

For purposes of this Agreement, the following terms have the following definitions:

A. "ECL": the Environmental Conservation Law.

B. "Day": a calendar day unless otherwise specified.

C. "Department": the New York State Department of Environmental Conservation.

D. "Site": that property located at 290 Bayville Avenue, Village of Bayville, Town of Oyster Bay, County of Nassau, Long Island, New York, Sec. 28, Block 20, Tax lot #58. Exhibit "A" of this Agreement is a map of the Site showing its general location.

E. "Volunteer": Bayville Village Cleaners, Inc. at 290 Bayville Avenue, Bayville, New York, the owner and operator of the Site.

F. "Work Plan": the Department-approved investigative work plan pertaining to the Site that Volunteer shall implement and that is attached to this Agreement as Exhibit "B", as may be modified under the terms of this Agreement and is an enforceable part of this Agreement.

CONSIDERING,

1. The Department is responsible for enforcement of the ECL. This Agreement is entered into pursuant to the Department's authority under that law.

2. A. The Volunteer intends to continue to operate a dry cleaning facility at the Site.

B. Volunteer represents, and for the purposes of this Agreement, the Department relies on those representations, that Volunteer's involvement with the Site and with the facility on that Site is limited to the following: Volunteer is the owner and operator of the Site and is responsible under law to remediate contamination existing at the Site and migrating from the Site as of the effective date of this Agreement.

3. The Department has the power, *inter alia*, to provide for the prevention and abatement of all water, land, and air pollution. ECL 3-0301.1.i.

4. Volunteer, desirous of implementing an investigation program acceptable to the Department, consents to the terms and conditions of this Agreement.

5. The Department and Volunteer agree that the goals of this Agreement are for Volunteer to,

A. implement the Work Plan; and

B. reimburse the State's administrative costs as provided in this Agreement.

6. Volunteer agrees to be bound by the terms of this Agreement. Volunteer consents to and agrees not to contest the authority or jurisdiction of the Department to issue or enforce this Agreement, and agrees not to contest the validity of this Agreement or its terms.

IN CONSIDERATION OF AND IN EXCHANGE FOR THE MUTUAL COVENANTS AND PROMISES SET FORTH BELOW, VOLUNTEER AGREES TO THE FOLLOWING:

I. Performance and Reporting of the Investigation Program

A. Within 30 days after the effective date of this Agreement, Volunteer shall commence implementation of the Work Plan and shall carry it out in accordance with its terms.

B. Volunteer shall notify the Department of any significant difficulties that may be encountered in implementing the Work Plan or any Department-approved modification to the Work Plan and shall not modify any obligation unless first approved by the Department.

C. During implementation of all field activities identified in the Work Plan, Volunteer shall have on-Site a full-time representative who is qualified to supervise the work done.

D. In accordance with the schedule contained in the Work Plan, Volunteer shall submit to the Department a final investigation report. The final investigation report shall:

1. include all data generated and all other information obtained during the investigation;

2. provide all of the assessments and evaluations identified in the Work Plan;

3. identify any additional data that must be collected; and

4. include a certification by the individual or firm with primary responsibility for the day to day performance of the investigation that all activities that comprised the investigation were performed in full accordance with the approved Work Plan.

II. Progress Reports

A. Volunteer shall submit to the parties identified in Subparagraph X.A.1 in the numbers specified therein copies of written monthly progress reports that:

1. describe the actions which have been taken toward achieving compliance with this Agreement during the previous month;

2. include all results of sampling and tests and all other data received or generated by Volunteer or Volunteer's contractors or agents in the previous month, including quality assurance/quality control information, whether conducted pursuant to this Agreement or conducted independently by Volunteer;

3. identify all reports and other deliverables required by this Agreement that were completed and submitted during the previous month;

4. describe all actions, including, but not limited to, data collection and implementation of the Work Plan, that are scheduled for the next month and provide other information relating to the progress at the Site;

5. include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of Volunteer's obligations under the Agreement, and efforts made to mitigate those delays or anticipated delays; and

6. include any modifications to the Work Plan that Volunteer has

of labor and materials, war, riot, obstruction or interference by adjoining landowners, or any other fact or circumstance beyond Volunteer's reasonable control ("*force majeure* event"). Volunteer shall, within five working days of when it obtains knowledge of any such *force majeure* event, notify the Department in writing. Volunteer shall include in such notice the measures taken and to be taken by Volunteer to prevent or minimize any delays and shall request an appropriate extension or modification of this Agreement. Volunteer shall have the burden of proving by a preponderance of the evidence that an event is a defense to compliance with this Agreement pursuant to this Subparagraph IV.B of this Agreement.

V. Entry upon Site

Volunteer hereby consents to the entry upon the Site or areas in the vicinity of the Site which may be under the control of Volunteer by any duly designated employee, consultant, contractor, or agent of the Department or any State agency having jurisdiction with respect to the Investigation Program for purposes of inspection, sampling, and testing and to ensure Volunteer's compliance with this Agreement. The Department shall abide by the health and safety rules in effect for work performed at the Site under the terms of this Agreement. Upon request, Volunteer shall provide the Department with suitable office space at the Site, including access to a telephone, and shall permit the Department full access to all records relating to matters addressed by this Agreement and to job meetings.

VI. Payment of State Costs

Within thirty days after receipt of an itemized invoice(s) from the Department, Volunteer shall pay to the Department a sum of money which shall represent reimbursement for the State's expenses including, but not limited to, direct labor, fringe benefits, indirect costs, travel, analytical costs, and contractor costs incurred by the State of New York for work performed at the Site to date, as well as for negotiating this Agreement, reviewing and revising submittals made pursuant to this Agreement, overseeing activities conducted pursuant to this Agreement, collecting and analyzing samples, and administrative costs associated with this Agreement. Each such payment shall be made by certified check payable to the Department of Environmental Conservation and shall be sent to:

Bureau of Program Management
Division of Environmental Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Personal service costs shall be documented by reports of Direct Personal Service, which

shall identify the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (*e.g.*, supplies, materials, travel, contractual) and shall be documented by expenditure reports.

B. Notwithstanding anything to the contrary contained herein, Volunteer shall have no obligation to pay the Department a sum of money which, in the aggregate, exceeds Five Thousand ($5,000.00) Dollars for the State's expenses incurred in connection with this Agreement.

VII. Department Reservation of Rights

A. Except as provided in Subparagraph I.E of this Agreement, nothing contained in this Agreement shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's rights (including, but not limited to, nor exemplified by, the right to recover natural resources damages) with respect to any party, including Volunteer.

B. Nothing contained in this Agreement shall prejudice any rights of the Department to take any investigatory or remedial action it may deem necessary.

C. Nothing contained in this Agreement shall be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

D. Nothing contained in this Agreement shall be construed to affect the Department's right to terminate this Agreement at any time during its implementation if Volunteer fails to comply substantially with this Agreement's terms and conditions.

VIII. Indemnification

Volunteer shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Agreement by Volunteer and/or any of Volunteer's directors, officers, employees, servants, agents, successors, and assigns. However, Volunteer shall not be required to indemnify the Department, the State of New York, and their representatives and employees regarding any liability arising as a result of the gross negligence or reckless, wanton or intentional misconduct by the Department, the State of New York, and their representatives and employees during the course of any activities conducted pursuant to this Agreement.

IX. Notice of Sale or Conveyance

A. Within 30 days after the effective date of this Agreement, Volunteer shall

1. file the Notice of Agreement, which is attached to this Agreement as Exhibit "C," with the Nassau County Clerk to give all parties who may acquire any interest in the Site notice of this Agreement and

2. provide the Department with evidence of such filing.

B. If Volunteer proposes to convey the whole or any part of Volunteer's ownership interest in the Site, Volunteer shall, not fewer than 60 days before the date of conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed date of the conveyance and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Agreement.

X. Communications

A. All written communications required by this Agreement shall be transmitted by United States Postal Service, by private courier service, or hand delivered.

1. Communication from Volunteer shall be sent to:

Jamie Ascher
Environmental Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation
SUNY, Building 40
Stony Brook, NY 11790-2356

with copies to:

G. Anders Carlson, Ph.D.
Director, Bureau of Environmental
Exposure Investigation
New York State Department of Health
Flanigan Square
Troy, New York 12180-2216

Jeanna E. Hussey, Esq.
New York State Department of Environmental Conservation
Division of Environmental Enforcement
200 White Plains Road, 5th Floor
Tarrytown, NY 10591-5805

Copies of work plans and reports shall be submitted as follows:

- Four copies (one unbound) to Jamie Ascher
- Two copies to Dr. Carlson

2. Communication to be made from the Department to Volunteer shall be sent to:

John V. Soderberg, Esq.
Farrell Fritz, P.C.
EAB Plaza, West Tower, 14th Fl
Uniondale, New York 11556

P.W. Grosser Consulting
630 Johnson Avenue
Suite 7
Bohemia, New York 11716-2618

B. The Department and Volunteer reserve the right to designate additional or different addressees for communication on written notice to the other given in accordance with this Paragraph X.

XI. Miscellaneous

A. 1. By entering into this Agreement, Volunteer certifies that Volunteer has fully and accurately disclosed to the Department all information known to Volunteer and all information in the possession or control of Volunteer's employees, contractors, and agents which relates in any way to the contamination existing on the effective date of this Agreement, and to any past or potential future release of hazardous substances, pollutants, or contaminants, at or from the Site and to their application for this Agreement.

2. If the Department determines that information Volunteer provided and certifications made are not materially accurate and complete, this Agreement, within the sole discretion of the Department, shall be null and void *ab initio* except with respect to the provisions of Paragraphs VI and VIII and except with respect to the Department's right to enforce those obligations under this Agreement, and the Department shall reserve all rights that it may have.

B. Volunteer shall retain professional consultants, contractors, laboratories, quality assurance/quality control personnel, and data validators acceptable to the Department to perform the technical, engineering, and analytical obligations required by this Agreement. The responsibility for the performance of the professionals retained by Volunteer shall rest solely with Volunteer.

C. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled by Volunteer, and the Department also shall have the right to take its own samples. Volunteer shall make available to the Department the results of all sampling and/or tests or other data generated by Volunteer with respect to implementation of this Agreement and shall submit these results in the progress reports required by this Agreement.

D. Volunteer shall notify the Department at least five working days in advance of any field activities to be conducted pursuant to this Agreement.

E. 1. Subject to Subparagraph XI.E.2 of this Agreement, the Volunteer shall obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform the Volunteer's obligations under this Agreement.

2. In carrying out the activities identified in the Work Plan, the Department may exempt Volunteer from the requirement to obtain any Department permit for any activity that is conducted on the Site and that satisfies all substantive technical requirements applicable to like activity conducted pursuant to a permit.

F. Volunteer, Volunteer's agents, servants, and employees (in the performance of their designated duties on behalf of Volunteer), and Volunteer's lessees, successors, and assigns shall be bound by this Agreement. Any change in ownership of Volunteer including, but not limited to, any transfer of assets or real or personal property shall in no way alter Volunteer's responsibilities under this Agreement. Volunteer's employees, servants, and agents shall be obliged to comply with the relevant provisions of this Agreement in the performance of their designated duties on behalf of Volunteer.

G. Volunteer shall provide a copy of this Agreement to each contractor hired to perform work required by this Agreement and to each person representing Volunteer with respect to the Site and shall condition all contracts entered into in order to carry out the obligations identified in this Agreement upon performance in conformity with the terms of this Agreement. Volunteer or Volunteer's contractors shall provide written notice of this Agreement to all subcontractors hired to perform any portion of the work required by this Agreement. Volunteer shall nonetheless be responsible for ensuring that Volunteer's contractors and subcontractors perform the work in satisfaction of the requirements of this Agreement.

H. The paragraph headings set forth in this Agreement are included for convenience of reference only and shall be disregarded in the construction and interpretation of any of the provisions of this Agreement.

I. 1. No term, condition, understanding, or agreement purporting to modify or vary any term of this Agreement shall be binding unless made in writing and

subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Volunteer of Volunteer's obligation to obtain such formal approvals as may be required by this Agreement.

2. If Volunteer desires that any provision of this Agreement be changed, Volunteer shall make timely written application, signed by the Volunteer, to the Commissioner setting forth reasonable grounds for the relief sought. Copies of such written application shall be delivered or mailed to Mr. Ascher and to Ms. Hussey.

J. This Agreement is not subject to review under the State Environmental Quality Review Act. 6 NYCRR 617.5(c)(18).

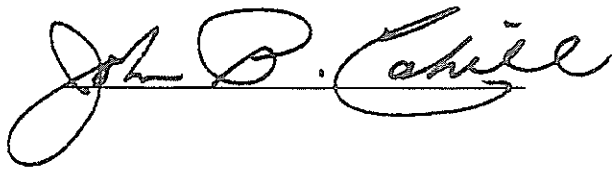
K. The provisions of this Agreement do not constitute and shall not be deemed a waiver of any right Volunteer otherwise may have to seek and obtain contribution and/or indemnification from other potentially responsible parties or their insurers, or Volunteer's insurers, for payments made previously or in the future for response costs.

L. Volunteer and Volunteer's officers, employees, servants, agents, lessees, successors, and assigns hereby affirmatively waive any right they had, have, or may have to make a claim pursuant to Article 12 of the Navigation Law with respect to the Site, and further release and hold harmless the New York State Environmental Protection and Spill Compensation Fund from any and all legal or equitable claims, suits, causes of action, or demands whatsoever that any of same has or may have as a result of Volunteer's entering into or fulfilling the terms of this Agreement with respect to the Site.

M. The effective date of this Agreement shall be the date attorneys for Volunteer receive this Agreement, signed and as issued by the Commissioner or his designee and as served upon Volunteer's attorney by certified mail.

DATED: 11/23/99

JOHN P. CAHILL, COMMISSIONER
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION



CONSENT BY VOLUNTEER

Volunteer hereby consents to the issuing and entering of this Agreement, waives Volunteer's right to a hearing herein as provided by law, and agrees to be bound by this Agreement.

Bayville ~~Village~~ Cleaners, Inc.

By: _____
Thomas Ryan, President

Date: _____

STATE OF NEW YORK)
) s.s.:
COUNTY OF NASSAU)

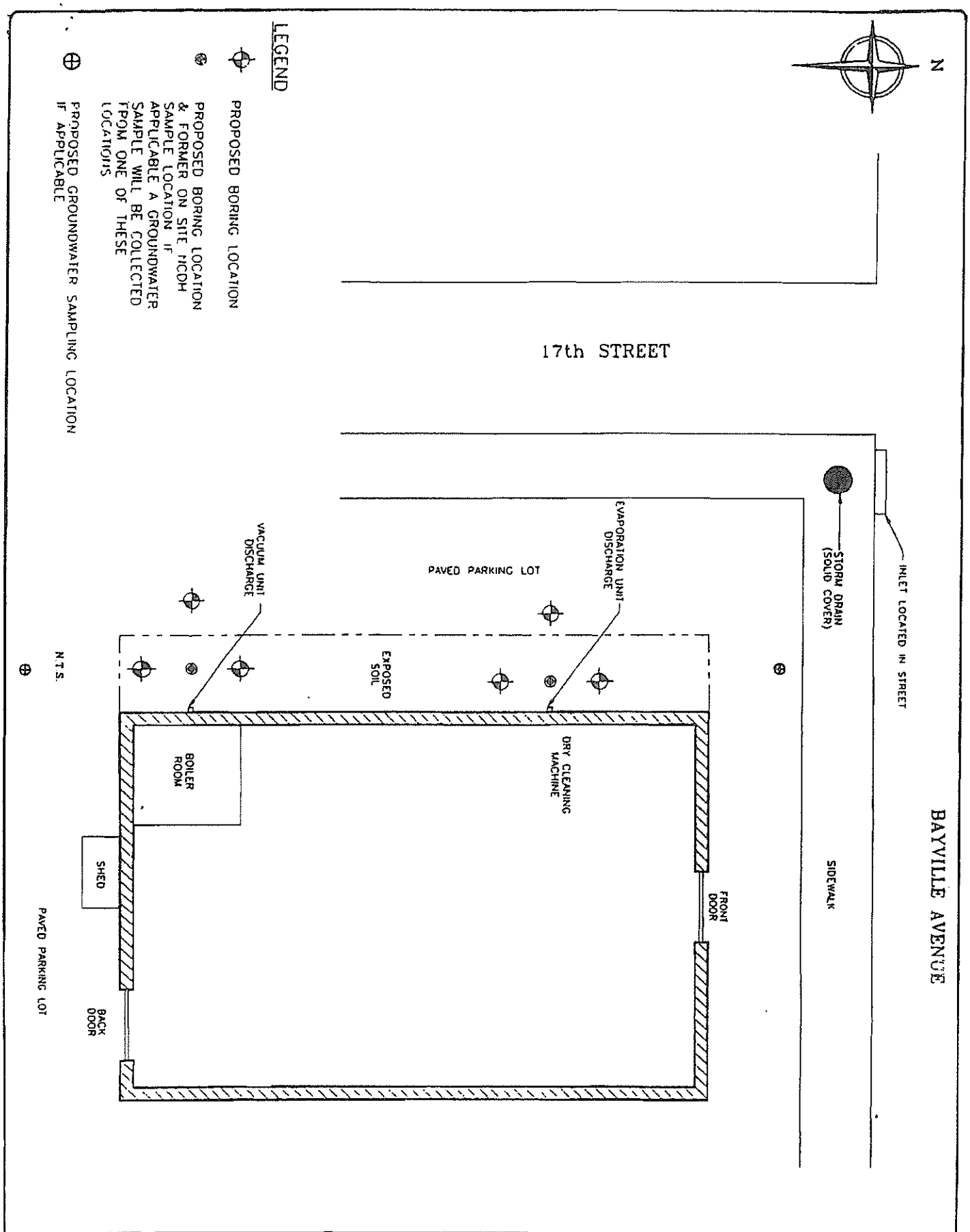
On this 13th day of September, 19 96, before me personally came Thomas Ryan, to me known, who being duly sworn, did depose and say that he resides in Glen Head NY; that he is the President of Bayville Village Cleaners, the corporation described in and which executed the foregoing instrument; that he knew the seal of said corporation; that the seal affixed to said instrument was such corporate seal; that it was so affixed by the order of the Board of Trustees of said corporation and that he signed his name thereto by like order.

Betty C. Hebron
Notary Public

BETTY HEBRON
Notary Public, State of New York
No. 4891657
Qualified in Nassau County
My Commission Expires May 4, 2001

EXHIBIT "A"

Map of Site



Prepared for: THOMAS RYAN

File No: BVC961-1 | Date: 3/19/96

SITE PLAN
SAMPLING LOCATIONS

290 BAYVILLE AVENUE
BAYVILLE, NEW YORK

FIGURE NO: 1

EXHIBIT "B"

Department-Approved Work Plan

Exhibit "C"

NOTICE OF AGREEMENT

This Notice is made as of the _____ day of _____, 1999 by Bayville Village Cleaners, Inc., the fee owner of a parcel of real property located at 290 Bayville Avenue, Bayville, NY as more particularly described on Appendix "A" attached hereto (the "Property"); and

WHEREAS, Bayville Village Cleaners, Inc., by authorized signature, entered into an agreement with the Department, Index #W1-0848-9903 (the "Agreement"), concerning the investigation of the Property, which Agreement was signed by the Commissioner of Environmental Conservation on _____; and

WHEREAS, pursuant to the Agreement, Bayville Village Cleaners, Inc. agreed that it would give notice of the Agreement to all parties who may acquire any interest in the Property by filing this Notice with the Nassau County Clerk,

NOW, THEREFORE, Bayville Village Cleaners, Inc., for itself, its successors and its assigns, declares that:

1. Notice of the Agreement is, hereby, given to all parties who may acquire any interest in the Property.

2. This Notice shall terminate upon the filing by Bayville Village Cleaners, Inc., or its successors and assigns, of a termination of notice of Agreement.

IN WITNESS WHEREOF, has executed this Notice of Agreement by its duly authorized representative.

Bayville Village Cleaners, Inc.

Dated: _____ By: _____

Its: _____

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Implementation of a modification to a **Voluntary Cleanup Agreement** for: Bayville Village Cleaners, New York by: Bayville Village Cleaners, Inc., "Volunteer"
Site #: V00220 Index #: W1-0848-13-04

WHEREAS, the New York State Department of Environmental Conservation (the "Department") and Bayville Village Cleaners, Inc. ("Volunteer") executed a Voluntary Cleanup Agreement for the investigation of the Bayville Village Cleaners, Site No. V00220, Index No. W1-0848-9903, dated November 23, 1999 (the "Agreement"). The Bayville Village Cleaners site is located at 290 Bayville Avenue, Village of Bayville, Town of Oyster Bay, Nassau County, New York (the "Site"). A copy of the Agreement is attached hereto as Exhibit "A"; and

WHEREAS, the Department is responsible for the enforcement of the ECL and the NL and such laws provide the Department authority to enter into this Agreement; and

WHEREAS, on August 11, 2011, the Department issued a decision document for the Site to present the selected remedy for the Site (the "Decision Document"). The elements of the selected remedy include the installation of a SSDS, use of an institutional control at the Site in the form of deed restrictions, and the development and the implementation of a Site Management Plan. The Decision Document is attached to this modification to the Agreement as Exhibit "B" and is incorporated as an enforceable part of this modification to the Agreement; and

WHEREAS, on August 15, 2011, the Department approved a "Revised Remedial Action Work Plan" for the Site prepared by Walden Associates dated April 2011, which proposed a remedy to "eliminate potential exposure to the sub-slab vapors detected at the Site by utilizing a sub-slab depressurization system" ("SSDS"); and

WHEREAS, in March 2013, the Volunteer sought modification of the Agreement to enable "closure on the Bayville Village Cleaners as my VCA contract did not provide for the proper work necessary for closure"; and

WHEREAS, the Department agreed to modify the Agreement to enable closure of the Voluntary Cleanup Program project for the Site, which requires, among other things, the development and implementation of a Site Management Plan, submission of a final engineering report, placement of deed restrictions, and the Department's issuance of a release letter upon completion of the remedial program for the Site.

NOW, THEREFORE, IN CONSIDERATION OF AND IN EXCHANGE FOR THE MUTUAL COVENANTS AND PROMISES, THE PARTIES AGREE TO THE FOLLOWING:

1. Paragraph I of the Agreement is hereby modified to add new subparagraphs that read as follows:

E. Site Specific Definitions

Unless otherwise expressly provided herein, terms used in this modification to the Agreement are defined in the ECL Article 27 or in regulations promulgated thereunder shall have the meaning assigned to them under said statute or regulations, including amendments thereto. The following terms shall have the following meaning:

1. "Contemplated Use": restricted commercial use excluding day care, child care and medical care uses.

2. "Existing Contamination": Contamination of soil, soil gas and groundwater beneath and in the vicinity of the Site with tetrachlorothene as described in the "Continued Soil and Groundwater Investigation & Remedial Measure at Bayville Village Cleaners", dated December 1996, "Site Investigation Report", dated December 9, 2008 and "Site Investigation Report Addendum", dated August 3, 2009. The term also includes contamination identified during the implementation of this Agreement, the nature and extent of which were unknown or insufficiently characterized as of the effective date of this Agreement, but which shall have been fully characterized and addressed to the Department's satisfaction.

3. "Covered Contamination": the concentrations of Existing Contamination remaining on the Site on the date that the Department issues the Release and Covenant Not to Sue that is substantially similar to Exhibit "C" attached to this modification to the Agreement.

F. Submission/Implementation of Work Plans

1. A Site Management Plan ("SMP") whose objective is to identify and implement the institutional and engineering controls required for the Site, as well as any necessary monitoring and/or operation and maintenance ("OM&M") of the remedy, shall be submitted to the Department within sixty (60) Days after the effective date of this modification to the Agreement. The Department shall notify Volunteer in writing of its approval or disapproval of the SMP.

2. If the Department approves the SMP, Volunteer shall implement the SMP in accordance with its schedule and terms as approved. If the Department disapproves the SMP, it will notify Volunteer in writing and shall specify the reasons for its disapproval. Within 30 days after Volunteer receives written notice that the SMP has been disapproved, Volunteer shall submit a revised submittal that addresses and resolves all of the Department's stated reasons for disapproving the initial submittal. After receipt of the revised submittal, the Department shall in a timely manner notify Volunteer in writing of its approval or disapproval of the revised submittal and the stated reasons therefore. If the Department disapproves the revised submittal, Volunteer shall revise and submit a revised submittal in accordance with the Department's comments within 30 business days of the Department's notice unless an alternative time is agreed to by the Department. If the Department disapproves the revised submittal, the Agreement shall terminate upon the Department so informing Volunteer in writing, and both parties reserve whatever rights that they may have had before the execution of the Agreement respecting the Site's remediation. If the Department approves the revised submittal, Volunteer shall implement it in accordance with its schedule and terms, as

approved. The SMP or revised submittal, as approved, shall be incorporated into and become an enforceable part of this Agreement.

3. Volunteer may opt to propose one or more additional or supplemental Work Plans (including one or more IRM Work Plans) at any time, which the Department shall review for appropriateness and technical sufficiency. The additional or supplemental work plan, as approved, shall be incorporated into and become an enforceable part of this Agreement.

4. A Professional Engineer must stamp and sign all Work Plans other than a Site Characterization or Remedial Investigation/Feasibility Study Work Plans.

5. During all field activities, Volunteer shall have on-Site a representative who is qualified to supervise the activities undertaken. Such representative may be an employee or a consultant retained by Volunteer to perform such supervision.

G. Release and Covenant Not to Sue

Upon the Department's determination that (i) Volunteer is in compliance with the Agreement; (ii) no requirements other than those remedial actions, exclusive of OM&M activities, already conducted at the Site, if any, are necessary to assure that Site conditions are protective of the public health and the environment based upon the Contemplated Use; and (iii) Volunteer has complied, if required, with Paragraph IX.C (Declaration of Covenants and Restrictions) of the Agreement, the Department shall timely provide Volunteer with the Release and Covenant No to Sue that is substantially similar to Exhibit "C," subject to the terms and conditions stated therein.

H. Submission of Final Reports and Annual Reports

1. In accordance with the schedule contained in a Work Plan, Volunteer shall submit a final report as provided at 6 NYCRR 375-1.6(b) and a final engineering report as provided at 6 NYCRR 375-1.6(c).

2. Any final report or final engineering report that includes construction activities shall include "as built" drawings showing any changes made to the remedial design or the IRM.

3. In the event that the final engineering report for the Site requires Site management, Volunteer shall submit an annual report by the 1st Day of the month following the anniversary of the start of the Site management. Such annual report shall be signed by a Professional Engineer or by such other qualified environmental professional as the Department may find acceptable and shall contain a certification as provided at 6 NYCRR 375-1.8(h)(3). Volunteer may petition the Department for a determination that the institutional and/or engineering controls may be terminated. Such petition must be supported by a statement by a Professional Engineer that such controls are no longer necessary for the protection of public health and the environment. The Department shall not unreasonably withhold its approval of such petition.

2. Paragraph VI. of the Agreement is hereby modified to add a new Subparagraph that reads as follows:

C. Payment of State Costs

1. Within forty-five (45) Days after receipt of an itemized invoice from the Department, Volunteer shall pay to the Department a sum of money which shall represent reimbursement of expenses incurred by the State of New York for all work related to the Site from August 12, 2011, the State's expenses for negotiating this Agreement, and all costs associated with this Agreement, through and including the Termination Date.

2. Personal service costs shall be documented by reports of Direct Personal Service, which shall identify the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (e.g., supplies, materials, travel, contractual) and shall be documented by expenditure reports. The Department shall not be required to provide any other documentation of costs, provided however, that the Department's records shall be available consistent with, and in accordance with, Article 6 of the Public Officers Law.

3. Such invoice shall be sent to the Volunteer at the following address:

Bayville Village Cleaners, Inc.
c/o Thomas C. Ryan
19 Todd Drive
Glen Head, NY 11545

4. Each such payment shall be made payable to the Department of Environmental Conservation and shall be sent to: Bureau of Program Management, Division of Environmental Remediation, New York State Department of Environmental Conservation, 625 Broadway, Albany, NY 12233-7010.

5. Each party shall provide written notification to the other within ninety (90) Days of any change in the foregoing addresses.

6. Volunteer may contest, in writing, invoiced costs under Subparagraph VI.C(1) if it believes (i) the cost documentation contains clerical, mathematical, or accounting errors; (ii) the costs are not related to the State's activities reimbursable under this Agreement; or (iii) the Department is not otherwise legally entitled to such costs. If Volunteer objects to an invoiced cost, Volunteer shall pay all costs not objected to within the time frame set forth in Subparagraph VI.C(1) and shall, within thirty (30) Days of receipt of an invoice, identify in writing all costs objected to and identify the basis of the objection. This objection shall be filed with the BPM Director. The BPM Director or the BPM Director's designee shall have the authority to relieve Volunteer of the obligation to pay invalid costs. Within forty-five (45) Days of the Department's determination of the objection, Volunteer shall pay to the Department the amount which the BPM Director or the BPM Director's designee determines Volunteer is

obligated to pay or commence an action or proceeding seeking appropriate judicial relief.

7. In the event any instrument for the payment of any money due under this Agreement fails of collection, such failure of collection shall constitute a violation of this Agreement, provided (i) the Department gives Volunteer written notice of such failure of collection, and (ii) the Department does not receive from Volunteer a certified check or bank check within fourteen (14) Days after the date of the Department's written notification.

3. Subparagraph VII.A of the Agreement is modified to read as follows:

A. Except as provided in this Agreement, nothing contained in this Agreement shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's rights or authorities (including, but not limited to, nor exemplified by, the right to recover natural resources damages) with respect to any party, including the Volunteer.

4. Paragraph IX of the Agreement is hereby modified to add new subparagraphs that read as follows:

C. Declaration of Covenants and Restrictions

1. Within thirty (30) Days after the execution of this modification to the Agreement, Volunteer shall submit to the Department for approval a Declaration of Covenants and Restrictions to run with the land which provides for covenants and restrictions consistent with the Work Plan, which relies upon one or more institutional controls. The submittal shall be substantially similar to Exhibit "D." Volunteer shall cause such instrument to be recorded with the County Clerk (or the City Register) in the county in which the Site is located within thirty (30) Days after the Department's approval of such instrument. Volunteer shall provide the Department with a copy of such instrument certified by the County Clerk (or the City Register) to be a true and faithful copy within thirty (30) Days of such recording (or such longer period of time as may be required to obtain a certified copy provided Volunteer advises the Department of the status of its efforts to obtain same within such 30 Day period).

2. Volunteer or the owner of the Site may petition the Department to modify or terminate the Declaration of Covenants and Restrictions filed pursuant to this Paragraph at such time as it can certify that the Site is protective of human health and the environment for residential uses without reliance upon the restrictions set forth in such instrument. Such certification shall be made by a Professional Engineer. The Department will not unreasonably withhold its consent.

5. Subparagraph XI.I.1. of the Agreement is hereby revised to read as follows:

I. 1. The terms of this Agreement, including any modification thereof, shall constitute the complete and entire Agreement issued to Volunteer concerning the Site's investigation and remediation. No term, condition, understanding, or agreement purporting to modify or vary any term of this Agreement shall be binding unless made in writing and

subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Volunteer of Volunteer's obligation to obtain such formal approvals as may be required by this Agreement.

6. This modification to the Agreement, and Agreement shall constitute the entire Agreement between the parties with all the terms and conditions of the Agreement, as herein modified, remaining in full force and effect.

7. The effective date of this modification to the Agreement shall be the date it is executed by the Commissioner or the Commissioner's designee.

DATED:

JUN 20 2013

JOSEPH MARTENS
COMMISSIONER
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

By: _____

Robert W. Schick, Director
Division of Environmental Remediation

CONSENT BY VOLUNTEER

Volunteer hereby consents to the issuing and entering of this Agreement, waives Participant's right to a hearing herein as provided by law, and agrees to be bound by this Agreement.

Bayville Village Cleaners, Inc.

By: _____

Title: _____

Date: _____

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 4th day of June, in the year 2013, before me, the undersigned, personally appeared Thomas J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he she they executed the same in his her their capacity(ies), and that by his her their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Signature and Office of individual taking acknowledgment

JOHN J. JORDAN III
Notary Public, State Of New York
No. 01J[illegible]6076100
Qualified In Nassau County
Commission Expires June 17, 2014

EXHIBIT "B"

August 2011 Decision Document

EXHIBIT "C"

Release and Covenant Not to Sue

Unless otherwise specified in this letter, all terms used in this letter shall have the meaning assigned to them under the terms of the Voluntary Cleanup Agreement entered into between the New York State Department of Environmental Conservation (the "Department") and Bayville Village Cleaners, Inc. ("Volunteer"), Index No.W1-0848-9903 (the "Agreement").

The Department is pleased to report that the Department is satisfied that the Agreement's Work Plan(s) relative to the Site, located at 290 Bayville Avenue, Town of Oyster Bay, Nassau County, New York has been successfully implemented.

The Department, therefore, hereby releases and covenants not to sue, and shall forbear from bringing any action, proceeding, or suit pursuant to the Environmental Conservation Law, the NL or the State Finance Law, and from referring to the Attorney General any claim for recovery of costs incurred by the Department, against Volunteer and Volunteer's lessees and sublessees, grantees, successors, and assigns, and their respective secured creditors, for the further investigation and remediation of the Site, based upon the release or threatened release of Covered Contamination, provided that (a) timely payments of the amounts specified in Paragraph VI of the Agreement continue to be or have been made to the Department, (b) appropriate deed restrictions remain recorded in accordance with Paragraph X of the Agreement, and (c) Volunteer and/or its' lessees, sublessees, successors, or assigns promptly commence and diligently pursue to completion the Work Plan providing for OM&M, if any. Nonetheless, the Department hereby reserves all of its respective rights concerning, and such release and covenant not to sue shall not extend to natural resource damages or to any further investigation or remedial action the Department deems necessary:

- due to migration off-Site of contaminants resulting in impacts that are not inconsequential to environmental resources, to human health, or to other biota and to off-Site migration of petroleum;

- due to environmental conditions or information related to the Site which were unknown at the time this Release and Covenant Not to Sue was issued and which indicate that the Contemplated Use cannot be implemented with sufficient protection of human health and the environment;

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Office of the Director
625 Broadway, 12th Floor, Albany, New York 12233-7011
P: (518) 402-9706 F: (518) 402-9020

August 24, 2016

Bayville Village Cleaners, Inc.
c/o Mr. Thomas C. Ryan
19 Todd Drive
Glen Head, NY 11545

Re: Site Name: Bayville Village Cleaners
Site No. V00220
Voluntary Cleanup Agreement Amendment No. 2
Changing the Contemplated Use

Dear Mr. Ryan:

This letter is forwarded to your attention to conform the Voluntary Cleanup Agreement ("VCA" or "Agreement") for the property located at 290 Bayville Avenue, Village of Bayville, Town of Oyster Bay, Nassau County, New York (the "Site"), Index No. W1-0848-9903 dated November 23, 1999 as modified on June 20, 2013 (Index No. W1-0848-13-04, to approved work under the Agreement.

Based on its review of the December 9, 2008 Site Investigation Report, the August 3, 2009 Site Investigation Report Addendum, the April 2011 Remedial Action Work Plan for the Site, and other relevant documents regarding the Site, the New York State Department of Environmental Conservation (the "Department" or "DEC") determined that the remedial actions performed on the Site will allow for a commercial use as defined in 6 NYCRR Section 375-l.8(g) at the Site.

In reliance upon, and in furtherance of the Agreement and discussions and/or communications regarding this matter between Department staff and Bayville Village Cleaners, Inc.'s (the "Volunteer") representative to date, the "Contemplated Use" described in the Specific Definitions Paragraph I.E.1 of the Agreement is modified to read as follows:

Contemplated Use: commercial use as defined in 6 NYCRR Section 375-l.8(g)(2)(iii), which allows for Industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv).

This modification to the Agreement is made in accordance with and subject to all of the terms and conditions of the Agreement and all applicable guidance, regulations and state laws applicable thereto. All other substantive and procedural terms of the Agreement will remain unchanged and in full force and effect regarding the Volunteer under the Agreement.

As such, the modification is hereby incorporated into and is enforceable pursuant to the subject Agreement. The correction is retroactive to the effective date of the Agreement.

Please have the Volunteer's duly authorized representative print, and counter-sign this letter Amendment to acknowledge acceptance of this Amendment. The **original** document with signature must be sent back to the Department at:

New York State Department of Environmental Conservation
Attention: Robert W. Schick, P.E. - Director
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233-7011

Please keep a copy of the countersigned letter as proof of the Amendment to the Agreement.

Nothing contained herein constitutes a waiver by the Department or the State of New York of any rights held in accordance with the Agreement or any applicable state and/or federal law or a release for any party from any obligations held under the Agreement or those same laws.

Please contact me if you have any questions in this regard. Thank you for your attention to this matter.

Sincerely,

Robert W. Schick, P.E.
Director
Division of Environmental Remediation

The following Volunteer, in signing this letter, hereby acknowledges and accepts the modification to the Agreement as set forth above.

Bayville Village Cleaners, Inc.

By: _____ _____ IND.
Signature Name and Title (please print)

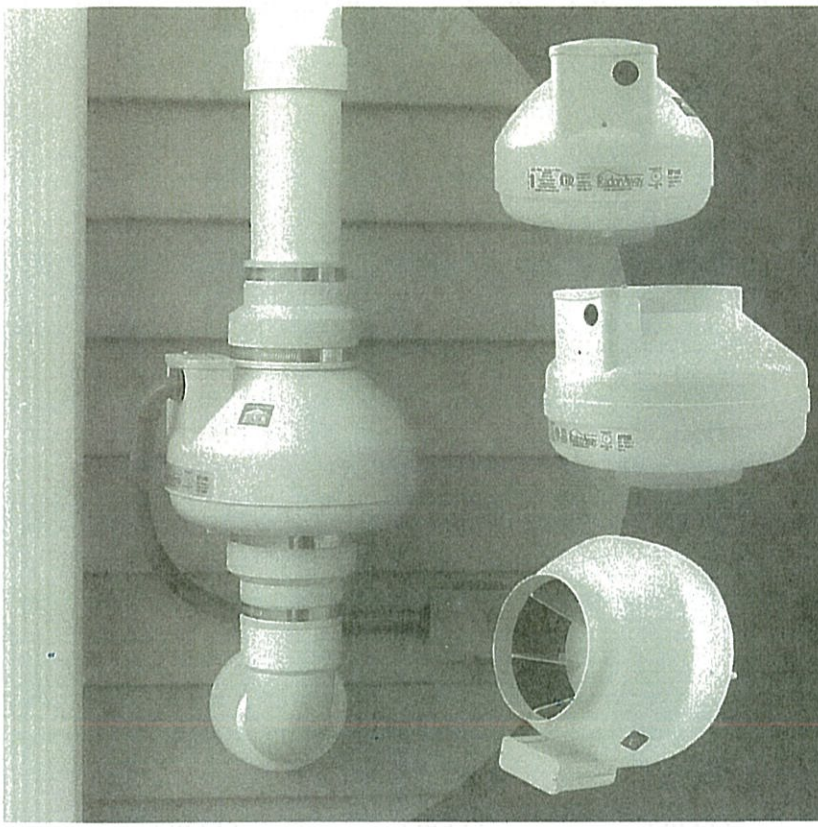
5/25/16
Date

APPENDIX XII – SSD SYSTEM MANUFACTURING PRODUCT INFORMATION SHEETS

RadonAway®

The world's leading radon fan manufacturer

RPc Series



Radon Mitigation Fan

All RadonAway® fans are specifically designed for radon mitigation. RPc Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140c & RP145c double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

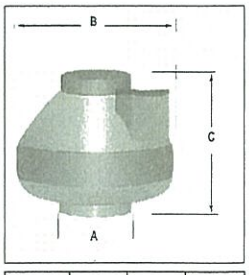
MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140c*	23029-1	4"	15-21	0.7	135	70	-	-	-
RP145c	23030-1	4"	41-72	1.7	166	126	82	41	3
RP260c	23032-1	6"	47-65	1.3	251	157	70	-	-
RP265c	23033-1	6"	91-129	2.2	334	247	176	116	52
RP380	28208	8"	95-152	2.0	497	353	220	130	38

Made in USA with U.S. and imported parts.

ETL Listed

All RadonAway® inline radon fans are covered by our 5-year, hassle-free warranty.

Most Efficient 2017



Model	A	B	C
RP140c	4.5"	9.7"	8.5"
RP145c	4.5"	9.7"	8.5"
RP260c	6"	11.75"	8.6"
RP265c	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact Your Radon Professional:

Rev C 0517
P/N 02008

RadonAway®

The world's leading radon fan manufacturer

RP / RPc Series

Installation Instructions

RadonAway

Fan Installation & Operating Instructions
Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. See RadonAway.com/vapor-intrusion.

2. **NOTE:** Fan is suitable for use with solid state speed controls; however, use of speed controls is not generally recommended.

2. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

3. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

4. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.

5. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

6. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

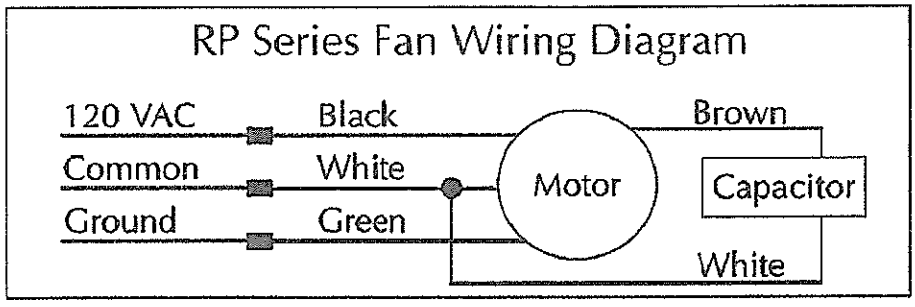
   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturers' guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) protected branch circuit.



1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The RP / RPc Series Radon Fans are intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of an RP / RPC Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The RP / RPc Series Fans are factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The RP / RPc Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F or more than 100 degrees F.

1.4 ACOUSTICS

The RP / RPc Series Fans, when installed properly, operate with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

[To ensure quiet operation of inline and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan(s). RP / RPc Series Fans are not suitable for kitchen range hood remote ventilation applications.]

1.5 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes, thus blocking air flow to the RP / RPc Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes, allowing for return to normal operation.

1.6 SLAB COVERAGE

The RP / RPc Series Fans can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP / RPc Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/140c and RP145/145c are best suited for general purpose use. The RP260/260c can be used where additional airflow is required, and the RP265/265c and RP380 are best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP / RPc Series Fan MUST be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP / RPc Series Fans are NOT suitable for underground burial.

For RP / RPc Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-

*Typical RP/RPc (except RP380/RP380c) Series Fan operational flow rate is 25 - 90 CFM on 3" and 4" pipe.(For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

1.8 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2, 28001-4 or 28421), should be provided and is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) with instructions for contacting the installing contractor for service and identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.9 VENTILATION

If used as a ventilation fan, any type of ducting is acceptable; however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air, for example, from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a "T" or "Y" fitting. Ideally, the duct should be arranged such that equal duct lengths are used between intake and "T" or "Y" fitting; this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems, then the opening on each grille should be equal in order to minimize noise and resistance. Straight smooth runs of rigid metal ducting will present the least resistance and maximize system performance. The Equivalent Length of Rigid Metal Ducting resulting in .2"WC pressure loss for each Fan Model is provided in the Specifications section of these instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance; recommended bend radius of elbow is at least 1.5 x duct diameter.

RP / RPc Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted farther away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction, preventing cold/hot draughts from entering the vented area and minimizing possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce backdraft dampers.

1.10 ELECTRICAL WIRING
The RP / RPc Series Fans operate on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

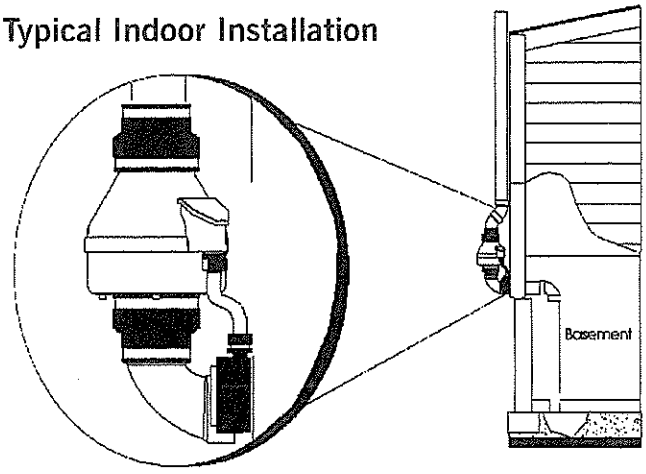
1.11 SPEED CONTROLS
The RP / RPc Series Fans are rated for use with electronic speed controls; however, speed controls are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control.

2.0 INSTALLATION

The RP / RPc Series Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The RP / RPc Series Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.

For the ENERGY STAR Labeled RP140 / RP140c , the ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

Typical Indoor Installation

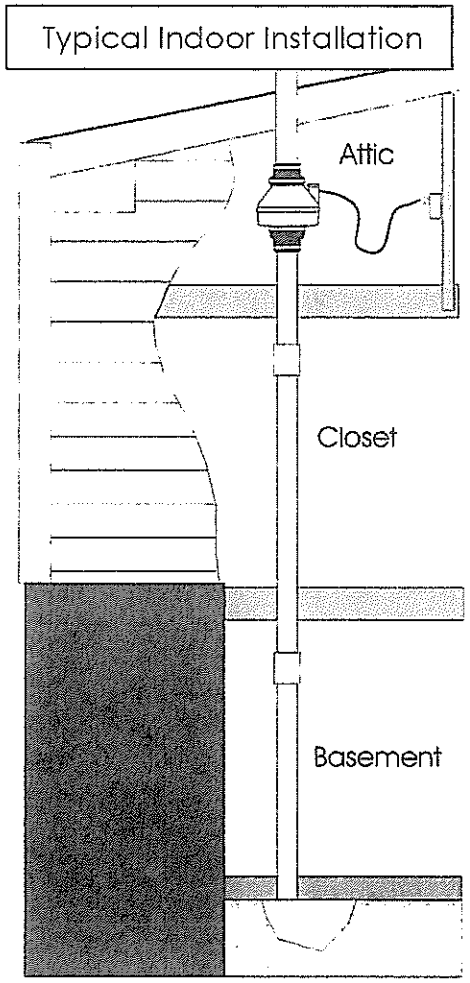


2.1 MOUNTING
Mount the RP / RPc Series Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)
The RP / RPc Series Fan may be optionally secured with the RadonAway mounting bracket (P/N 25007 or 25033 for RP380 only). Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.



2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10). Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

_____ **Verify** all connections are tight and **leak-free**.

_____ **Ensure** the RP / RPc Series Fan and all ducting are **secure and vibration-free**.

_____ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.
(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

RP / RPc Series Product Specifications

The following chart shows fan preformance for the RP / RPc Series Fans:

Typical CFM Vs. Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140/140c	135	103	70	14	-	-	-	-	
RP145/145c	166	146	126	104	82	61	41	21	3
RP260/260c	251	209	157	117	70	26	-	-	-
RP265/265c	334	291	247	210	176	142	116	87	52
RP380	531	490	415	340	268	200	139	84	41

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
RP140/140c	15 - 21 watts	0.7" WC
RP145/145c	41 - 72 watts	1.7" WC
RP260/260c	47-65 watts	1.4" WC
RP265/265c	91 - 129 watts	2.2" WC
RP380	96 - 138 watts	2.2" WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet	L.2
RP140/140c	8.5"H x 9.7" Dia.	5.5 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25
RP145/145c	8.5"H x 9.7" Dia.	5.5 lbs	4,5" OD	15
RP260/260c	8.6"H x 11.75" Dia.	5.5 lbs	6.0" OD	48
RP265/265c	8.6"H x 11.75" Dia.	6.5 lbs	6.0" OD	30
RP380	10.53"H x 13.41" Dia.	11.5 lbs	8.0" OD	57

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2" WC pressure loss (see CFM Vs Static Pressure "WC Table).

Recommended Ducting: RP/RPc Series Fans (excluding RP380), 3" or 4" Schedule 20/40 PVC Pipe; RP380, 6" Schedule 20/40 PVC Pipe

PVC Pipe Mounting: If used for Ventilation, use 4", 6" or 8" Rigid or Flexible Ducting. Mount on the duct pipe or with optional mounting bracket.

Storage Temperature Range: 32-100 degrees F

Thermal Cutout:

RP140/140c	130°C (266°F)
RP145/145c	150°C (302°F)
RP260/260c	150°C (302°F)
RP265/265c	150°C (302°F)
RP380	150°C (302°F))

Continuous Duty

Class F Insulation (RP140/RP140c Class B)

Thermally Protected Auto Reset

3000 RPM

Rated for Indoor or Outdoor Use

LISTED Electric Fan

Intertek 77728

Conforms to UL STD. 507

Certified to CAN/CSA STD. C22.2 No.113

ENERGY STAR RP140 Only

2100 HVI CERTIFIED

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RadonAway® RP/RPc, GP/GPc, XR/XRc, XP/XPc, XR and SF Series Fan for shipping damage within 15 days of receipt. **Notify RadonAway of any damages immediately.** RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open the housing.** Return unit to factory for service.

Install the RP/RPc, GP/GPc, XP/XPc, XR and SF Series Fan in accordance with all EPA, ANSI/AARST standard practices, and state and local building codes and regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

Warranty

RadonAway® warrants that the RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner (the "Warranty Term").

RadonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway®.

The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

5-YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to 60 months (5 years) from date of purchase or 66 months from date of manufacture, whichever is sooner, provided that the fan is installed by a professional radon mitigation contractor. Proof of purchase and/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the Continental United States and Canada beyond the standard 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner.

RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

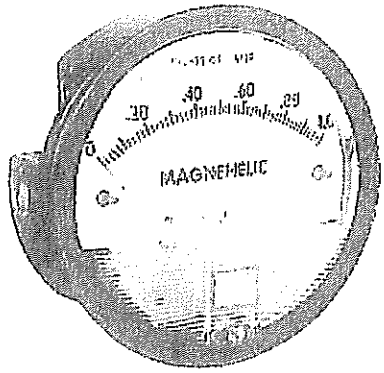
Record the following information for your records:

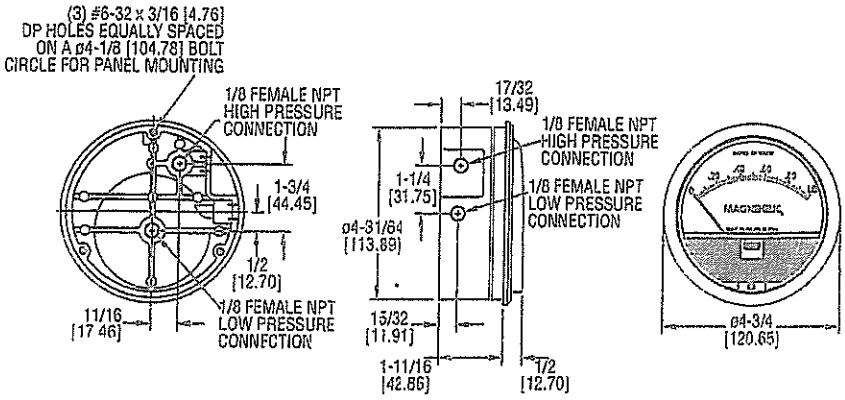
Serial Number: _____ Purchase Date: _____

Series 2000

Magnehelic® Differential Pressure Gages

Indicate Positive, Negative or Differential, Accurate within 2%





Dimensions, Standard Series 2000 Magnehelic® Pressure Gages.
(Slightly different on medium and high pressure models)

Select the Dwyer® Magnehelic® gage for high accuracy – guaranteed within 2% of full scale – and for the wide choice of 81 models available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates low air or non-corrosive gas pressures – either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

The Magnehelic® gage is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

Note: May be used with Hydrogen. When ordering a Buna-N diaphragm pressures must be less than 35 psi.

Mounting

A single case size is used for most models of Magnehelic® gages. They can be flush or surface mounted with standard hardware supplied. With the optional A-610 Pipe Mounting Kit they may be conveniently installed on horizontal or vertical 1-1/4" - 2" pipe. Although calibrated for vertical position, many ranges above 1" may be used at any angle by simply re-zeroing. However, for maximum accuracy, they must be calibrated in the same position in which they are used. These characteristics make Magnehelic® gages ideal for both stationary and portable applications. A 4-9/16" hole is required for flush panel mounting. Complete mounting and connection fittings plus instructions are furnished with each instrument.

Flush...Surface... or Pipe Mounted

Vent Valves

In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

High and Medium Pressure Models

Installation is similar to standard gages except that a 4-13/16" hole is needed for flush mounting. The medium pressure construction is rated for internal pressures up to 35 psig and the high pressure up to 80 psig. Available for all models. Because of larger case, the medium pressure and high pressure models will not fit in a portable case size. Installation of the A-321 safety relief valve on standard Magnehelic® gages often provides adequate protection against infrequent overpressure.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. (Natural Gas option available.)
Wetted Materials: Consult factory.
Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy: ±2% of full scale (±3% on - 0, -100 Pa, -125 Pa, 10MM and ±4% on - 00, -60 Pa, -6MM ranges), throughout range at 70°F (21.1°C).
Pressure Limits: -20" Hg. to 15 psig.† (-0.677 bar to 1.034 bar); MP option: 35 psig (2.41 bar), HP option: 80 psig (5.52 bar).
Overpressure: Relief plug opens at approximately 25 psig (1.72 bar), standard gages only.
Temperature Limits: 20 to 140°F.* (-6.67 to 60°C).
Size: 4" (101.6 mm) Diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: 1/8" female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight: 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (963 g).
Standard Accessories: Two 1/8" NPT plugs for duplicate pressure taps, two 1/8" pipe thread to rubber tubing adapter and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for 3 adapters in MP & HP gage accessories.)

*Low temperature models available as special option.
†For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options at lower left.

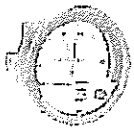
OPTIONS AND ACCESSORIES

Transparent Overlays

Furnished in red and green to highlight and emphasize critical pressures.

Adjustable Signal Flag

Integral with plastic gage cover. Available for most models except those with medium or high pressure construction. Can be ordered with gage or separate.



LED Setpoint Indicator

Bright red LED on right of scale shows when setpoint is reached. Field adjustable from gage face, unit operates on 12-24 VDC. Requires MP or HP style cover and bezel.

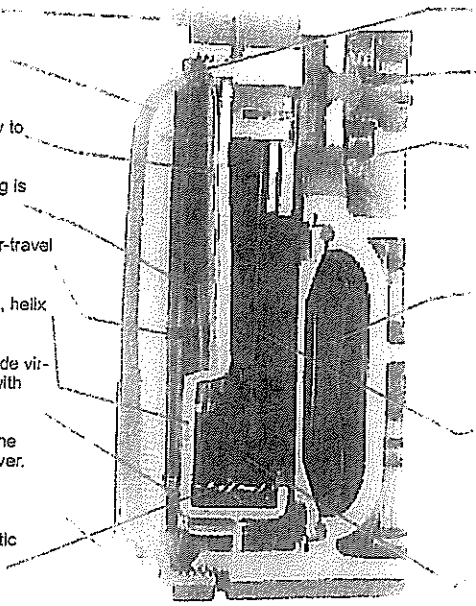
A-432 Portable Kit

Combine carrying case with any Magnehelic® gage of standard range, except high pressure connection. Includes 9 ft (2.7 m) of 3/16" I.D. rubber tubing, standhang bracket and terminal tube with holder.

A-605 Air Filter Gage Accessory Kit

Adapts any standard Magnehelic® gage for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft (1.5 m) lengths of 1/4" aluminum tubing two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves.

Quality design and construction features



Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

Precision litho-printed scale is accurate and easy to read.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

Pointer stops of molded rubber prevent pointer over-travel without damage.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Jeweled bearings are shock-resistant mounted, provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Zero adjustment screw is conveniently located in the plastic cover, and is accessible without removing cover. O-ring seal provides pressure tightness.

Helix is precision made from an alloy of high magnetic permeability. Mounted in jeweled bearings, it turns freely, following the magnetic field to move the pointer across the scale.

O-ring seal for cover assures pressure integrity of case.

Blowout plug of silicone rubber protects against overpressure on 15 psig rated models. Opens at approximately 25 psig.

Die cast aluminum case is precision made and iridite-dipped to withstand 168 hour salt spray corrosion test. Exterior finished in baked dark gray hammerloid. One case size is used for all standard pressure options, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded O-ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Calibrated range spring is flat spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

Samarium Cobalt magnet mounted at one end of range spring rotates helix without mechanical linkages.

Series 2000 Magnehelic® Gage — Models and Ranges
Page V shows examples of special models built for OEM customers. For special scales furnished in ounces per square inch, inches of mercury, metric units, square root scales for volumetric flow, etc., contact the factory.

Model	Range Inches of Water
2000-00N†••	.05-0-.2
2000-00†••	0-.25
2000-0†•	0-.50
2001	0-1.0
2002	0-2.0
2003	0-3.0
2004	0-4.0
2005	0-5.0
2006	0-6.0
2008	0-8.0
2010	0-10
2012	0-12
2015	0-15
2020	0-20
2025	0-25
2030	0-30
2040	0-40
2050	0-50
2060	0-60
2080	0-80
2100	0-100
2120	0-120
2150	0-150
2160	0-160
2180	0-180
2250	0-250
Zero Center Ranges	
2300-00†••	0.125-0-0.125
2300-0†•	.25-0-.25
2301	.5-0-.5
2302	1-0-1
2304	2-0-2
2310	5-0-5
2320	10-0-10
2330	15-0-15

Model	Range PSI
2201	0-1
2202	0-2
2203	0-3
2204	0-4
2205	0-5
2210*	0-10
2215*	0-15
2220*	0-20
2230**	0-30

Model	Range, CM of Water
2000-15CM	0-15
2000-20CM	0-20
2000-25CM	0-25
2000-50CM	0-50
2000-80CM	0-80
2000-100CM	0-100
2000-150CM	0-150
2000-200CM	0-200
2000-250CM	0-250
2000-300CM	0-300
Zero Center Ranges	
2300-4CM	2-0-2
2300-10CM	5-0-5
2300-30CM	15-0-15

†These ranges calibrated for vertical scale position.
• Accuracy +/-3%
•• Accuracy +/-4%
*MP option standard
**HP option standard

Model	Range MM of Water
2000-6MM†••	0-6
2000-10MM†•	0-10
2000-15MM	0-15
2000-25MM	0-25
2000-30MM	0-30
2000-50MM	0-50
2000-80MM	0-80
2000-100MM	0-100
2000-125MM	0-125
2000-150MM	0-150
2000-200MM	0-200
2000-250MM	0-250
2000-300MM	0-300
Zero Center Ranges	
2300-6MM†••	3-0-3
2300-10MM†•	5-0-5
2300-20MM†•	10-0-10
Model	Range, Pa
2000-60NPA†••	10-0-50
2000-60PA†••	0-60
2000-100PA†•	0-100
2000-125PA†•	0-125
2000-250PA	0-250
2000-300PA	0-300
2000-500PA	0-500
2000-750PA	0-750
2000-1000PA	0-100 x 10
Zero Center Ranges	
Model	Range, Pa
2300-60PA†••	30-0-30
2300-100PA†•	50-0-50
2300-120PA	60-0-60
2300-200PA	100-0-100
2300-250PA	125-0-125
2300-300PA	150-0-150
2300-500PA	250-0-250
2300-1000PA	500-0-500

Model	Range, kPa
2000-0.5KPA	0-0.5
2000-1KPA	0-1
2000-1.5KPA	0-1.5
2000-2KPA	0-2
2000-2.5KPA	0-2.5
2000-3KPA	0-3
2000-4KPA	0-4
2000-5KPA	0-5
2000-8KPA	0-8
2000-10KPA	0-10
2000-15KPA	0-15
2000-20KPA	0-20
2000-25KPA	0-25
2000-30KPA	0-30
Zero Center Ranges	
2300-1KPA	.5-0-.5
2300-2KPA	1-0-1
2300-2.5KPA	1.25-0-1.25
2300-3KPA	1.5-0-1.5

Dual Scale Air Velocity Units
For use with pilot tube

Model	Range in W.C./ Velocity F.P.M.
2000-00AV†••	0-.25/300-2000
2000-0AV†•	0-.50/500-2800
2001AV	0-1.0/500-4000
2002AV	0-2.0/1000-5600
2005AV	0-5.0/2000-8800
2010AV	0-10/2000-12500

Dual Scale English/Metric Models

Model	Range, In. W.C.	Range, Pa or kPa
2000-OOD†••	0-.25	0-62 Pa
2000-OD†•	0-0.5	0-125 Pa
2001D	0-1.0	0-250 Pa
2002D	0-2.0	0-500 Pa
2003D	0-3.0	0-750 Pa
2004D	0-4.0	0-1.0 kPa
2005D	0-5.0	0-1.25 kPa
2006D	0-6.0	0-1.5 kPa
2008D	0-8.0	0-2.0 kPa
2010D	0-10	0-2.5 kPa
2015D	0-15	0-3.7 kPa
2020D	0-20	0-5 kPa
2025D	0-25	0-6.2 kPa
2050D	0-50	0-12.4 kPa
2060D	0-60	0-15 kPa

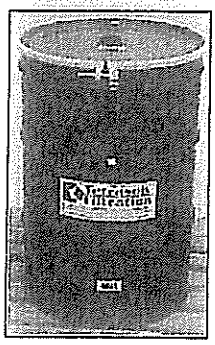
ACCESSORIES
A-299, Surface Mounting Bracket
A-300, Flat Flush Mounting Bracket
A-310A, 3-Way Vent Valve
A-321, Safety Relief Valve
A-432, Portable Kit
A-448, 3-piece magnet kit for mounting Magnehelic® gage directly to magnetic surface
A-605, Air Filter Kit
A-610, Pipe Mount Kit

OPTIONS — To order, add suffix: i.E. 2001-ASF
ASF, Adjustable Signal Flag
HP, High Pressure Option
LT, Low Temperatures to -20°F
MP, Med. Pressure Option
SP, Setpoint Indicator
Scale Overlays, Red, Green, Mirrored or Combination. Specify Locations

Catalog

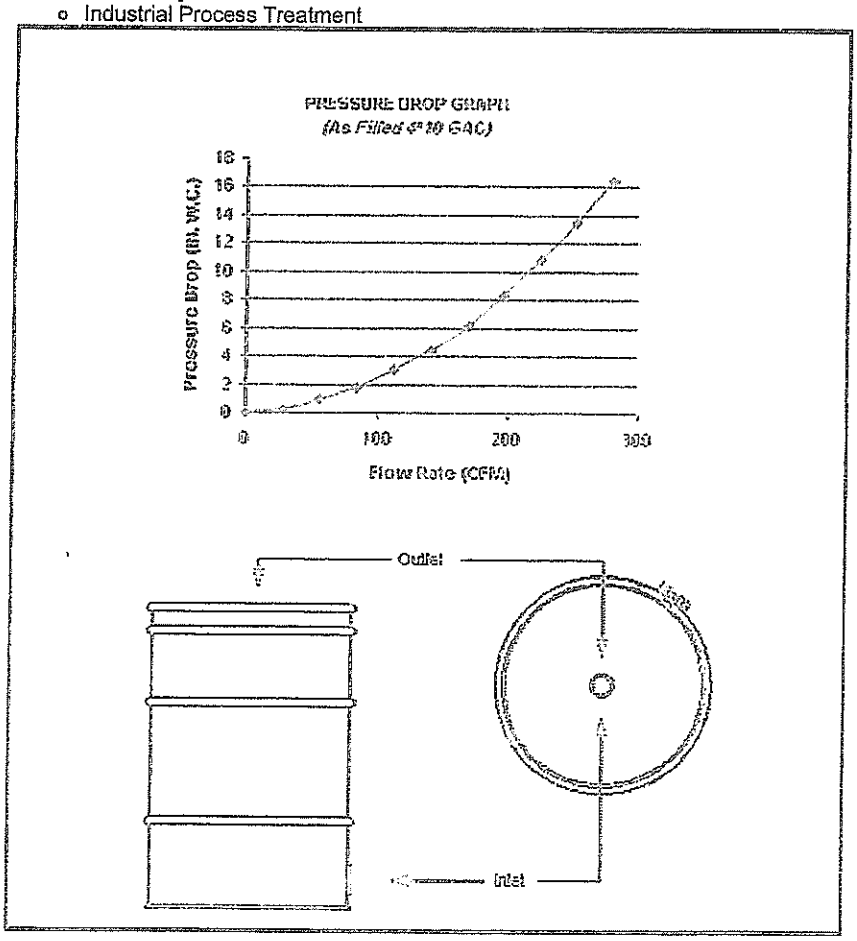
Contents:

VFD SERIES FILTERS
MODEL VFD-55



The VFD-55 filter is a media filter vessel designed to treat vapor streams. While the typical design application is a activated carbon adsorbtion unit, the filter can easily accommodate many medias. The sturdy construction makes these filter vessels ideal for long term treatment units. Some applications include:

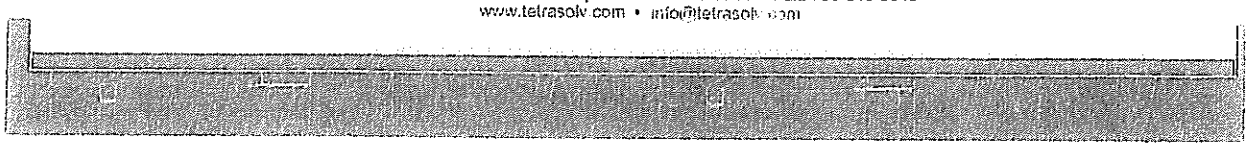
- Soil Vapor Extraction Treatment
- Air Stripper Off Gas Treatment
- Odor Removal System
- Storage Tank Purge Vapor Treatment
- Pilot Study
- Industrial Process Treatment



VFD-55 SPECIFICATIONS

Overall Height	2'10"	Vessel/Internal Piping Materials	CS/CS (False Floor)
Diameter	23"	Internal Coating	Polyamide Epoxy Resin
Inlet / Outlet (FNPT)	2"	External Coating	Urethane Enamel
Drain / Vent (FNPT)	OPT	Maximum Pressure / Temp	4 PSIG / 250° F
GAC Fill (lbs)	175	Cross Sectional Bed Area	2.8 FT^2
Shipping / Operational Weight (lbs)	225/300	Bed Depth/Volume	2.2 FT / 6.3 FT^3

Tetrasolv Filtration, Inc. • 1200 East 26th Street • Anderson, Indiana 46016 • USA
Toll Free: 800-441-4034 Telephone: 765-643-3941 • Fax: 765-643-3949
www.tetrasolv.com • info@tetrasolv.com



APPENDIX XIII – INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY FORM

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.