



**SUB-SLAB DEPRESSURIZATION SYSTEM
OPERATION, MAINTENANCE & MONITORING PLAN**

**MARTINO'S MASTER DRY CLEANERS
7513 41st AVENUE
KENOSHA, WI 53142
WDNR BRRTS# 02-30-552188**

August 22, 2017

Prepared For:

Martino's Master Dry Cleaners
7513 41st Avenue
Kenosha, WI 53142

Prepared By:

EnviroForensics, LLC.
N16 W23390 Stone Ridge Drive, Suite G
Waukesha, WI 53188
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TABLE OF CONTENTS

| | | |
|------------|--|----------|
| 1.0 | BACKGROUND | 1 |
| 1.1 | Site History | 1 |
| 2.0 | CONTACTS | 1 |
| 3.0 | SYSTEM DESIGN AND CONSTRUCTION | 2 |
| 4.0 | SYSTEM OPERATION, MAINTENANCE, AND MONITORING | 2 |
| 4.1 | System Operation..... | 2 |
| 4.2 | System Monitoring..... | 2 |
| 4.3 | System Maintenance and Repairs | 3 |
| 4.4 | Inspection and Repair Logs | 3 |
| 4.5 | Notifications..... | 3 |
| 5.0 | DECOMMISSIONING AND CONTINUING OBLIGATIONS..... | 3 |

APPENDICES

- Appendix A Vapor Mitigation System Installation Report
- Appendix B Inspection and Repair Logs



1.0 BACKGROUND

A sub-slab depressurization (SSD) system was installed at 7513 41st Avenue in Kenosha, Wisconsin to mitigate potential vapor intrusion risk. At the time of installation, the property was occupied by Martino's Master Dry Cleaners (Martino's). The SSD system was designed to depressurize the sub-slab space and prevent vapors from migrating into the building and affecting indoor air quality. The Wisconsin Department of Natural Resources (WDNR) requires that SSD systems be monitored and maintained to ensure ongoing effectiveness. Proper operation of the SSD system is necessary to prevent exposure to the chemicals of concern via vapor intrusion.

1.1 Site History

The Site operates as a plant-on-premises dry cleaning facility. Undocumented and likely incidental releases of tetrachloroethene (PCE) occurred over time near the former dry cleaning machine location. The specific path to the subsurface was not identified; however, the PCE migrated vertically through soil beneath the Site building and adjoining commercial space causing soil, groundwater, and soil gas impacts that exceed WDNR health-based standards and screening levels.

2.0 CONTACTS

Property Owner: Dan Martino, Sr.
Address: 7513 41st Avenue, Kenosha WI 53142
Contacts: Dan Martino, Sr.
Telephone #: 262-694-7858
Email: danmartinosr@aol.com

System Design and Installation: Vapor Protection Services
Address: 825 N. Capitol Ave, Indianapolis, IN 46204
Contact: Jason Condry
Contact/Telephone #: 317-972-7870

Consultant: EnviroForensics, LLC
Address: N16 W23390 Stone Ridge Dr., Suite G, Waukesha, WI 53188
Contacts: Brian Kappen, Project Manager; Rob Hoverman, Senior Project Manager
Telephone #: 262-290-4001
Email: bkappen@enviroforensics.com or rhoverman@enviroforensics.com

WDNR Project Manager: Doug Cieslak
Address: 141 NW Barstow St, Room 180, Waukesha, WI 53188
Telephone #: 262-574-2182
Email: doug.cieslak@wisconsin.gov

3.0 SYSTEM DESIGN AND CONSTRUCTION

EnviroForensics contracted Vapor Protection Services (VPS) of Indianapolis, Indiana to design and install the SSD system. The system was installed on November 15-16, 2012. Design and construction documentation for the SSD system is provided in the January 9, 2013 *Vapor Mitigation Installation Report* prepared by VPS, included as **Appendix A**.

The final system configuration is depicted on Figure 1 of the VPS Report. The system is constructed with two (2) extraction points (EP-1 and EP-2) connected via 4-inch PVC piping to a single fan mounted on the exterior of the building. Each extraction point is equipped with a u-tube manometer to indicate that the system is operating.

4.0 SYSTEM OPERATION, MAINTENANCE, AND MONITORING

The property owner will be responsible for operation, maintenance, and monitoring (OM&M) of the SSD system until the WDNR grants case closure for the Site.

4.1 System Operation

The fan is hardwired to a dedicated circuit breaker in the electrical panel. An on/off switch is located on the exterior of the building near the fan. Operation of the system can be confirmed by inspecting the fan or checking the manometers. The system is designed and intended to operate continuously.

4.2 System Monitoring

The Wisconsin Department of Natural Resources (WDNR) has issued recommendations for long-term SSD system monitoring programs (see October 7, 2015 Issues and Trends webinar at <http://dnr.wi.gov/topic/Brownfields/TrainingLibrary.html>). The recommendations have been adopted and incorporated into this OM&M Plan.

The following maintenance and monitoring procedures are required to be conducted annually during the winter months starting in 2017:

1. Measure sub-slab pressure field extension (PFE). The PFE will be measured by connecting a hand-held digital manometer to sub-slab test ports installed in the floors.
2. Measure flow rate in the piping leading to each fan using a thermo-anemometer inserted into ports in the piping.
3. Confirm vacuum induced by each extraction point by checking u-tube manometers.

4. Visually inspect the concrete floor penetration seals and all system components including fans, manometers, pressure switches, and piping connections.

System monitoring requirements are summarized in the table below.

| Parameter | Location | Equipment |
|--------------------------------|---------------------|-------------------|
| Pressure Field Extension (PFE) | Sub-slab test ports | Digital manometer |
| Flow Rate | Extraction piping | Thermo-Anemometer |
| Pressure | Extraction piping | U-tube manometer |
| System condition | Multiple | Visual inspection |

4.3 System Maintenance and Repairs

The mitigation fan is factory sealed and requires no maintenance. In the event that the fan stops operating due to mechanical failure, the fan shall be replaced with an identical model or a fan with the same performance specifications. Replacement of fans should be handled by a mitigation contractor and/or an electrician. Maintenance and repair activities on other components, including piping and floor seals, can be performed by the environmental consultant or building maintenance personnel.

4.4 Inspection and Repair Logs

Inspection and repair logs shall be completed by the person or group responsible for OM&M of the SSD system. The completed inspection log shall include the findings of the visual inspection, the flow rate measurement, and verification of complete PFE. The logs shall be kept on file by the environmental consultant and/or the property owner and made available to WDNR upon request. Blank logs are provided in **Appendix B**.

4.5 Notifications

The WDNR shall be notified at least 30 days before any actions are taken which would terminate or interrupt operation of the SSD system for more than one week.

5.0 DECOMMISSIONING AND CONTINUING OBLIGATIONS

The SSD system will be operated until it is no longer needed to prevent vapor intrusion. A Decommissioning Plan will be prepared, if appropriate. In general, decommissioning will be performed according to the following procedure:

- Re-assess the VI pathway in the buildings.
 - Turn the system off for 30 days
 - Collect indoor air and sub-slab vapor samples

- Re-start system after sampling
- Repeat system shut-down sampling during winter months
- Submit Post-Closure Modification to WDNR with fees
- Turn the SSD system off following WDNR approval

Reliance upon the SSD system to mitigate vapor movement into the Site building at the time of case closure will result in a continuing obligation for the Martino's Master Dry Cleaners or any future property owner to operate and maintain the SSD system post-closure. Post-closure OM&M reporting shall be done using the Continuing Obligations Inspection and Maintenance Log (WDNR Form 4400-305).



APPENDIX A

Vapor Mitigation System Installation Report



**VAPOR
PROTECTION
SERVICES**

Vapor Protection Services
6507 Ferguson Street, Suite B-1
Indianapolis, Indiana 46220
Telephone: (317) 252-5295

January 9, 2013

Brian Kappen
EnviroForensics
200 South Executive Drive, Suite 101
Brookfield, WI 53005

Vapor Mitigation System Installation Report
7513 41st Avenue
Kenosha, WI 53142

This Vapor Mitigation System Installation Report summarizes the work performed at 7513 41st Avenue in Kenosha, Wisconsin (Site).

SSDS Installation

Vapor Protection Services (VPS) installed a sub-slab depressurization system (SSDS) at the Site on November 15-16, 2012, at the request of EnviroForensics.

The SSDS consists of two (2) extraction points and one (1) RadonAway model GP501 fan hardwired to a dedicated circuit breaker and a dedicated on/off switch located near the fan. The SSDS is designed to draw air from below the foundation slab and release it into the outdoor air while simultaneously maintaining a negative pressure or vacuum beneath the slab.

An SSDS As-Built Drawing depicting the SSDS layout is included **Figure 1**. Also depicted on the As-Built Drawing are pressure field extension (PFE) test points and micromanometer readings collected after the system was installed. PFE readings collected from these test points indicate the SSDS is effectively maintaining a negative pressure of at least 0.04" of water beneath the foundation slab. Manufacturer specifications and warranty information for the GP501 fan and the installer's radon mitigation certification are included.

System Monitoring and Periodic Inspection

Each extraction point is equipped with a u-tube manometer that indicates if the system is on and working. If the liquid in each tube of the u-tube manometer becomes level, contact VPS to service the system.

The RadonAway GP501 fan is factory sealed and designed to be maintenance free for the life of the fan. The fan's casing should not be opened under any circumstance else the factory warranty and any service warranty will be voided.

An inspection of the SSDS should be conducted on a semiannual basis to verify that the system is operating properly. The inspection should include the following:

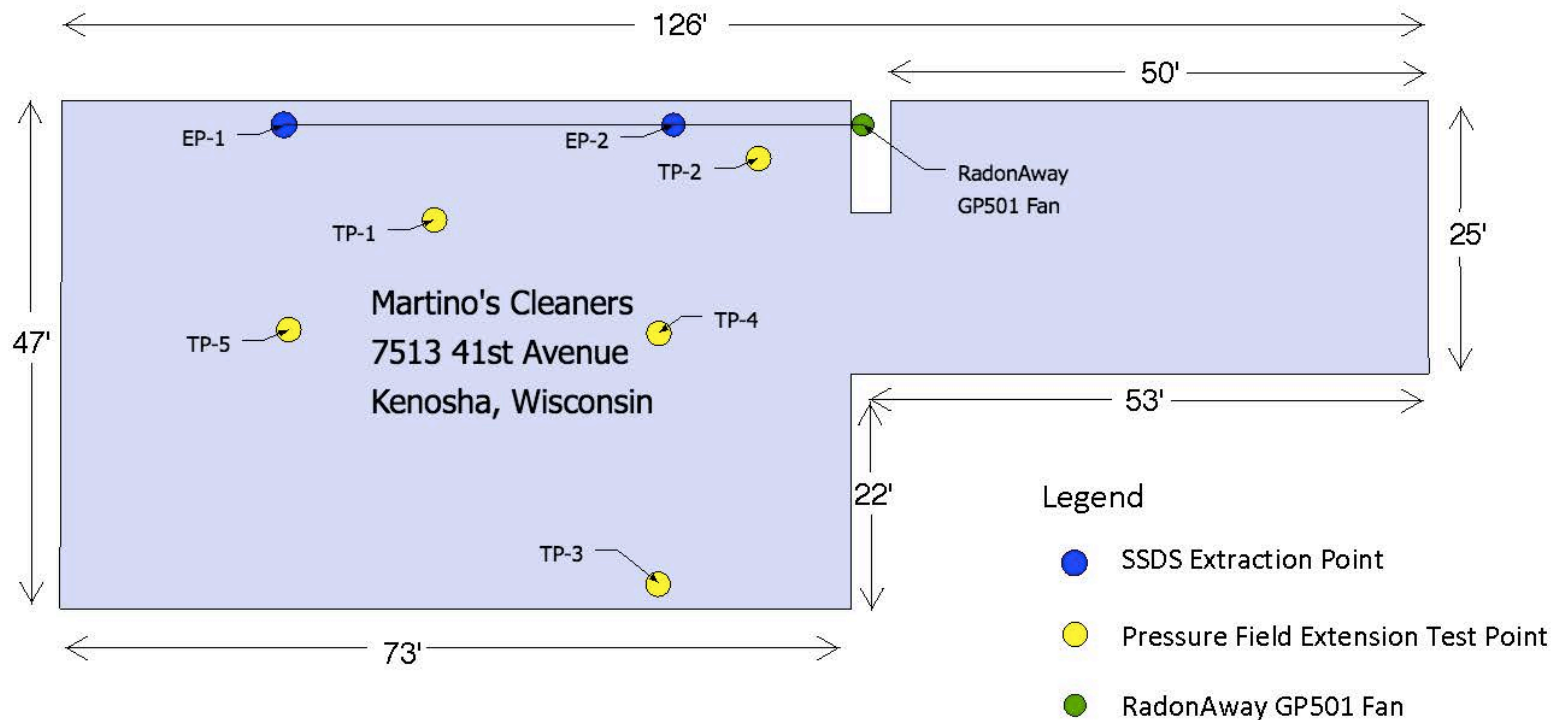
1. Observe the SSDS fan and note any abnormal sounds or noises coming from the fan including buzzing, scraping, rattling, and et cetera. If any abnormal noises or sounds are observed, contact VPS.
2. Inspect the PVC piping of the system for damage or cracks. If any damage occurs to the PVC piping contact VPS. If any cracks are observed during inspection, seal any cracks.
3. Inspect the caulk seal of the depressurizations sumps where the SSDS piping penetrates the concrete. Re-caulk any cracks or leaks if observed.
4. Contact VPS for additional Service & Maintenance should the occasion arise.

Contact

Please feel free to contact our office at (317) 252-5295 anytime with questions about the SSDS. Thank you for the opportunity to serve you.



VAPOR
PROTECTION
SERVICES



Legend

- SSDS Extraction Point
- Pressure Field Extension Test Point
- RadonAway GP501 Fan

Pressure Field Extension Results

| | |
|------|-----------|
| TP-1 | 0.100" WC |
| TP-2 | 0.052" WC |
| TP-3 | 0.034" WC |
| TP-4 | 0.007" WC |
| TP-5 | 0.021" WC |

Figure 1: SSDS As-Built
7513 41st Avenue
Kenosha, Wisconsin 53142

GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

| | Typical CFM Vs Static Suction "WC | | | | | | |
|-------|-----------------------------------|------|------|------|------|------|------|
| | 1.0" | 1.5" | 2.0" | 2.5" | 3.0" | 3.5" | 4.0" |
| GP501 | 95 | 87 | 80 | 70 | 57 | 30 | 5 |
| GP401 | 93 | 82 | 60 | 38 | 12 | - | - |
| GP301 | 92 | 77 | 45 | 10 | - | - | - |
| GP201 | 82 | 58 | 5 | - | - | - | - |

| Maximum Recommended Operating Pressure* | | |
|---|-----------|-------------------------|
| GP501 | 3.8" W.C. | (Sea Level Operation)** |
| GP401 | 3.0" W.C. | (Sea Level Operation)** |
| GP301 | 2.4" W.C. | (Sea Level Operation)** |
| GP201 | 1.8" W.C. | (Sea Level Operation)** |

**Reduce by 10% for High Temperature Operation*

***Reduce by 4% per 1000 feet of altitude*

| Power Consumption @ 120 VAC | |
|-----------------------------|----------------|
| GP501 | 70 - 140 watts |
| GP401 | 60 - 110 watts |
| GP301 | 55 - 90 watts |
| GP201 | 40 - 60 watts |

Inlet/Outlet: 3.5" OD (3.0" PVC Sched 40 size compatible)

Mounting: Fan may be mounted on the duct pipe or with integral flanges.

Weight: 12 lbs.

Size: 13H" x 12.5" x 12.5"

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

3000 RPM

Thermally Protected

Rated for Indoor or Outdoor Use



IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GPx01/XP/XR 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.** Return unit to factory for service.

Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPx01/XP/XR Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. 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.

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.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR 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 cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No. _____
Purchase Date _____



Certificate of Course Completion
Radon Mitigation Technology

Nicolas Martinez

December 28, 2012

Presented by:

Center for Environmental Research & Technology, Inc.

Denise M. Brown
Director of Education





APPENDIX B

Inspection and Repair Logs

MARTINO'S DRY CLEANERS - 41ST AVENUE
INSPECTION LOG

Inspections to be completed annually during winter

| Inspection Date | Inspector Name/Company | All PFE Measurements Negative? | Flow Rate (fpm) | Inspection Findings and Recommended Actions |
|------------------------|-------------------------------|---------------------------------------|------------------------|--|
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Log shall be kept on file by environmental consultant and/or property owner.

MARTINO'S DRY CLEANERS - 41ST AVENUE

REPAIR LOG

| Date | Personnel/Company | System Address | Description of Problem | Description of Modification or Repair |
|-------------|--------------------------|-----------------------|-------------------------------|--|
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Log shall be kept on file by environmental consultant and/or property owner.