INVENTUM ENGINEERING, PC

March 19, 2025

To: Benjamin McPherson (NYSDEC) and Angela Martin (NYSDOH)

From: John Black (Inventum)

CC: John Yensan (OSC); Dan Flanigan (OSC); James Edwards (Inventum)

RE: Building 8 - Sub-Slab Soil Vapor Sampling Work Plan
Riverview Innovation & Technology Campus, Inc.
Brownfield Cleanup Program Site No. C915353
Town of Tonawanda, New York

Inventum Engineering, P.C. (Inventum), on behalf of Riverview Innovation & Technology Campus, Inc. (Riverview), is submitting this Sub-Slab Soil Vapor Sampling Work Plan for Building 8 located on the Riverview Innovation & Technology Campus Brownfield Cleanup Program (BCP) Site (#C915353) at 3875 River Road in Tonawanda, New York. Building 8 was historically used as an office building, a laboratory, electrical department, storeroom for dry goods, breakroom (mezzanine level), and machine shop during the former Tonawanda Coke Corporation (TCC) operations. A current breakroom, offices, and restroom and showers is in an annex attached to the western side of Building 8. Since March 2022, Riverview has used the eastern portion of Building 8, which was the former machine shop and equipment storage for TCC, as the location for the temporary groundwater treatment system.

The main portion of Building 8 is a 1-story slab-on-grade foundation structure with a shallow pitched metal roof, brick walls and limited metal siding. The footprint is approximately 10,900 square feet, not including the attached breakroom. The portion of Building 8 that houses the temporary groundwater treatment system is heated by propane using ceiling mounted heating elements. The majority of the building is unheated. The breakroom portion of Building 8 is also a slab-on-grade foundation structure covering an area of approximately 1,700 square feet with a brick façade with a flat roof design and this portion of the building is heated using electric heating units. The attached Figure 1 shows an aerial image of Building 8.

Purpose

A new groundwater treatment system (GWTS) is required as a component of the selected remedial alternative. Riverview would like to utilize Building 8 to house the permanent groundwater treatment system. The exterior façade, windows, and roof will be improved, but the building footprint and foundation[1] will remain as it is currently constructed. The attached Figure 2 shows the intended future use of Building 8 which includes converting the current breakroom section of Building 8 to be used for office space, restrooms, and showers (office space) for use by facility personnel who's roles would include operation of the permanent groundwater treatment system and operations and maintenance of the post remediation Riverview Site. The office space portion of Building 8 would be operated as separate building and will have an independent Heating, Ventilation and Air Conditioning (HVAC) separate from the other

[1] Depending on the selected groundwater treatment equipment, some modifications to the slab may be required.

portion of Building 8. The main portion of Building 8 which is approximately 10,900 square feet with a shallow pitched metal roof and will be divided into two sections with the western portion housing the new permanent GWTS and the eastern portion being and open space used for storage of grounds maintenance equipment and support operation and maintenance (O&M) shop. The permanent GTWS and O&M maintenance shop will have an independent heating system with no air conditioning system which will be operated separate from the office space and will most likely be heated by propane heating elements to prevent freezing condition inside the building. The independent HVAC and heating systems of the office space and the GWTS / O&M maintenance shop will limit preferential pathways for potential vapors from the GTWS and O&M maintenance shop to affect the office space.

Riverview understands indoor air sampling will be required under a supplemental work plan for the office space after renovation is complete to assess exposure scenario in the building and to determine if actions are needed to address any identified exposures. It is not be practical to collect indoor air samples at this time due to likelihood of detecting constituents;

- Emitted from the temporary groundwater treatment system that is in currently in operation,
- Emitted from the building materials due to historical use of Building 8 as a maintenance shop,
- Current storage of volatile organic compounds (VOCs) containing materials,
- And the porous nature of the constructed walls and doors between the break room (future office space) and the eastern portion of Building 8.

Collecting sub-slab soil vapor samples within the footprint of Building 8 will allow characterization of soil vapor conditions below Building 8. Other future building construction at the Riverview site is anticipated to be slab-on-grade construction and a soil vapor intrusion analysis will be conducted for all future occupied structures.

This work plan outlines the installation and sampling of three (3) sub-slab soil vapor test points within Building 8. The proposed locations were selected to be representative of the Building 8 footprint and in locations that are not currently occupied by building components or the operating groundwater treatment equipment. The proposed test points are shown on the attached Figure 1:

- SV-BCP-01 – the enclosed and heated restroom and shower area;
- SV-BCP-02 – the unheated dry storage area; and
- SV-BCP-03 – The storage area adjacent to the heated groundwater treatment area.

Limited cleaning products are stored in the restroom shower area (SV-BCP-01), wastes and other products have been historically and are currently stored near the SV-BCP-02 location, and paints and other chemicals were historically stored in the area represented by SV-BCP-03.

Scope of Work

Prior to installing test points, the interior of the building will be surveyed to document materials (e.g. paints, oils, and fuels) that contain VOCs, although indoor are samples are not included as part of this work plan. Interior samples would represent the ongoing use of the building for groundwater treatment and storage.

Three (3) sub-slab test points will be installed in Building 8 at the locations shown on Figure 1. The new sub-slab vapor probes will be constructed with 0.125-inch or 0.25-inch low-density polyethylene (LDPE)

or Teflon tubing extended no more than 2-inches into the sub-slab material. The core hole through the floor will be sealed with a non-VOC emitting surface sealant (e.g. modeling clay). Alternatively, Inventum may utilize a Vapor Pin® sampling device for installation. Standard operating procedures (SOP) for utilization of the Vapor Pin system will be adhered to and are provided for reference in Attachment A. After installation, one to three volumes (probe and tubing) will be purged at a flow rate not to exceed 0.2 liter per minute (L/min). During test point installation and sampling, a PiD will be used to measure and record any VOC readings.

Sub-slab vapor samples will be collected in general accordance with the NYSDOH guidance document (NYSDOH, 2006, Guidance for Evaluating Soil Vapor Intrusion in the State of New York, as updated). One (1) 8-hour sample will be collected using at each sub-slab location in a laboratory certified clean 2.7-liter Summa® canister and a certified clean flow controller, and submitted to Pace Analytical Laboratories of Buffalo, New York for VOC analysis (including naphthalene) using EPA Method TO-15/TO-15-SIM. Matrix A and C compounds as listed within the NYSDOH guidance document will utilize a reporting limit of 0.20 $\mu g/m^3$. Matrix B, D, E, and F compounds will utilize a reporting limit of 1.0 $\mu g/m^3$. Sub-slab samples will be collected from the permanent SSD sample port installed. One to three volumes (probe and tubing) will be purged prior to collecting the samples. Purging and sample collecting will not exceed a flow rate of 0.2 L/min.

Vapor monitoring probe seals will be verified using helium tracer testing (or the water dam method included in SOP provided in Attachment A) and will be conducted at each sample location prior to sample collection following the protocol(s) in the NYSDOH Soil Vapor Intrusion (SVI) guidance document.

Once this Sub-Slab Soil Vapor Sampling Work Plan for Building 8 is approved by the NYSDEC and NYSDOH, both agencies will be notified 5-days in advance of installing the test points.

HASP and CAMP

The current Health and Safety Plans (HASPs) and the 2025 Community Air Monitoring Plan (CAMP) will be adhered to during all work. The previously approved CAMP includes special requirements for ground intrusive activities within 20-feet of the occupied structures or within the buildings. However, Building 8 will not be occupied during soil vapor sampling.

Reporting and Schedule

The sub-slab soil vapor sampling for Building 8 will be implemented in accordance with the following schedule:

- Installation of new sub-slab vapor ports within 30-days of NYSDEC and NSYDOH approval of this work plan. Ideally, Riverview would like to conduct the sub-slab soil vaporing sampling that is outlined in the Work Plan before mid-April 2025.
    - Since only sub-slab soil vapor sampling will be conducted under this work plan, it is not necessary to schedule this work during the heating season. However, future sub-slab soil vapor and indoor air sampling in the renovated building will need to be completed during the heating season to assess the worst-case scenario for SVI to occur.
- Provide 5-day notice to the NYSDEC and NYDOH prior to installing the three (3) sample points.
- Submit a Soil Vapor Summary Report within 30-days of receiving the analytical data. The report will include:

- Summary of sub-slab sampling data and comparison to available NYSDOH guidance document matrices; and
- Final laboratory data packages included EQUiS submittals and a Data Usability Summary Report (DUSR).

Engineering Certification

I, John P. Black certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Building 8 - Sub-Slab Soil Vapor Sampling Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities producing the data were performed in full accordance with NYSDEC-approved work plans and any NYSDEC-approved modifications.

Respectfully Submitted,

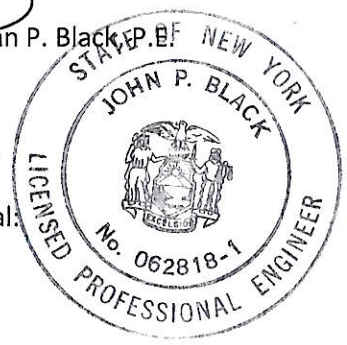
Inventum Engineering, P.C.

John P. Black, P.E.

Date: March 19, 2025

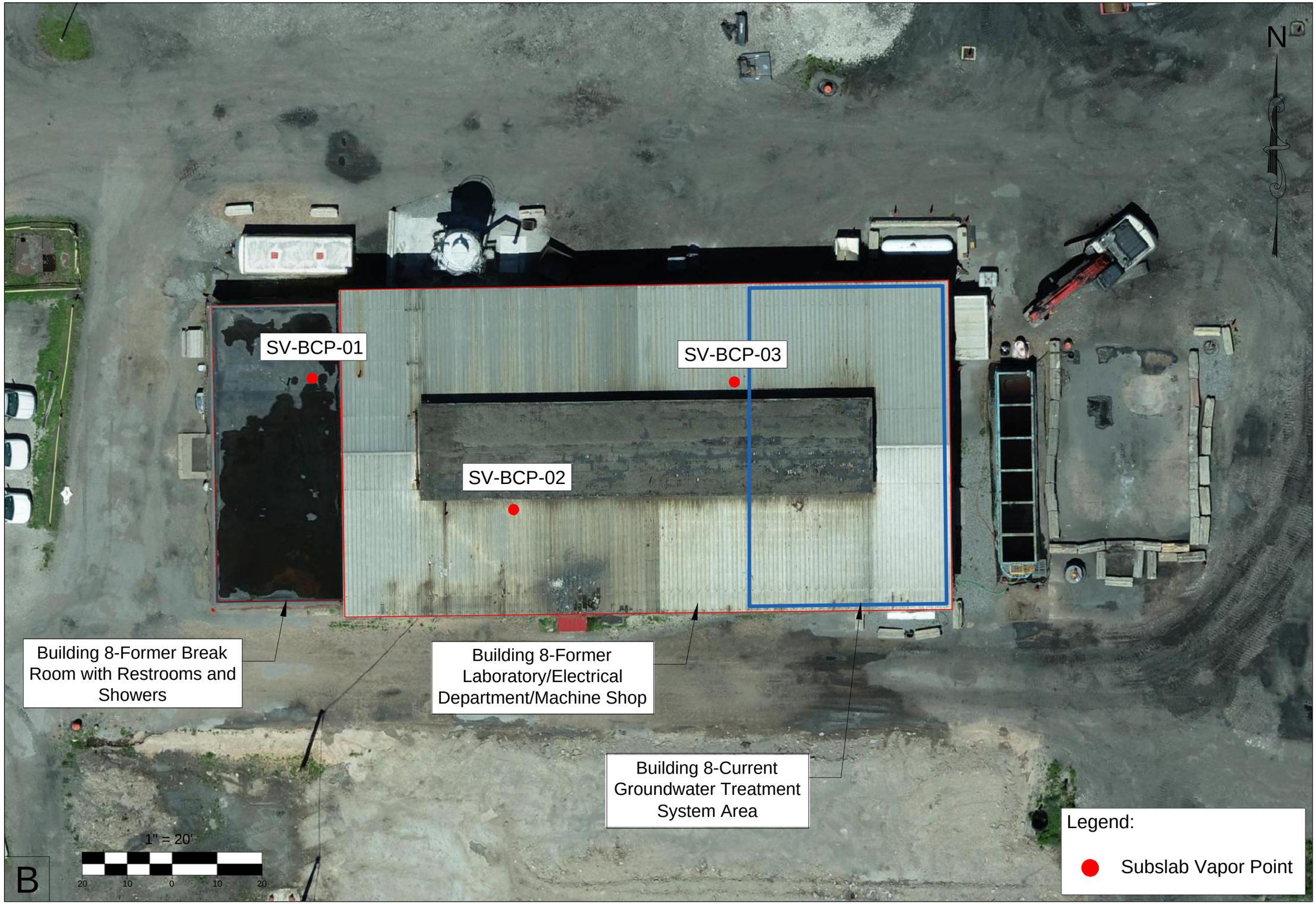
License No: 062818-1

Seal:



It is a violation of the laws of New York for any person, unless acting under the direction of a Licensed Professional Engineer, to alter any item or any portion of this document in any way. If an item bearing the seal of a Licensed Professional Engineer is altered, the altering Engineer shall affix to the item his/her seal and notation "altered by" followed by his/her signature and the date of such alternation, and a specific description of the alteration.

Figures



DRAWING BY	CB
CHECKED	JE
APPROVED	

PROPERTY OF INVENTUM ENGINEERING

IMPORTANT: THIS DRAWING IS OWNED AND COPYRIGHTED BY INVENTUM ENGINEERING AND IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREIN IS NOT TO BE DISCLOSED OR REPRODUCED IN WHOLE OR IN PART TO ANY PERSON OR ENTITY OTHER THAN NECESSARY PARTNERS, FINANCIAL INSTITUTIONS, REGULATORY AGENCIES AND PROJECT CONSULTANTS WITHOUT THE WRITTEN CONSENT OF INVENTUM ENGINEERING.

NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE PROFESSIONAL SUPERVISION AND CONTROL OF A LICENSED PROFESSIONAL ENGINEER. IT IS A VIOLATION OF STATE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY.

BUILDING 8 SOIL VAPOR POINTS
RIVERVIEW INNOVATION AND TECHNOLOGY CAMPUS
3875 RIVER ROAD
TONAWANDA, NY

INVENTUM ENGINEERING
441 CARLISLE DRIVE
SUITE C
HERNDON, VIRGINIA 20170

FIGURE 1

DRAWING NUMBER

DRAWING BY	CB
CHECKED	JE
APPROVED	

BUILDING 8 FUTURE POTENTIAL USE
RIVERVIEW INNOVATION AND TECHNOLOGY CAMPUS
3875 RIVER ROAD
TONAWANDA, NY

INVENTUM ENGINEERING
441 CARLISLE DRIVE
SUITE C
HERNDON, VIRGINIA 20170

FIGURE 2
DRAWING NUMBER

Attachment A - Vapor Pin Standard Operating Procedures

Standard Operating Procedure

Installation and Extraction
Vapor Pin® Sampling Device

Scope & Purpose

Scope

This standard operating procedure describes the installation and extraction of the Vapor Pin® Sampling Device for use in sub-slab soil-gas sampling.

Purpose

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin® Sampling Device.

Equipment Needed

- Vapor Pin® Sampling Device
- Vapor Pin® Sleeves
- Vapor Pin® Cap
- Installation/Extraction Tool
- Rotary Hammer Drill
  - ⅝-Inch (16mm) diameter hammer bit
  - 1½-Inch (38mm) diameter hammer bit for flush mount applications
- ¾-Inch (19mm) diameter bottle brush
- Wet/Dry Vacuum with HEPA filter (optional)
- Dead Blow Hammer
- VOC-free hole patching material (hydraulic cement) and a putty knife or trowel
  - This is for repairing the hole following the extraction of the Vapor Pin® Sampling Device

Installation Procedure

1. Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.
2. Set up wet/dry vacuum to collect drill cuttings.
3. For a temporary installation, drill a ⅝-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. The hole must be ⅝-inch (16mm) in diameter to ensure a seal.
   - If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. We highly recommend using the Stainless Steel Drilling Guide and to reference the Standard Operating Procedure Drilling Guide & Secure Cover.
4. Remove the drill bit, brush the hole with the bottle brush and remove the loose cuttings with the vacuum.
5. Assemble the Vapor Pin® Sampling Device and Vapor Pin® Sleeve (Figure 1).
6. Place the lower end of the Vapor Pin® Sampling Device assembly into the drilled hole. Place the small hole located in the handle of the Installation/Extraction Tool, over the Vapor Pin® to protect the barb fitting and tap the Vapor Pin® into place using a dead blow hammer (Figure 2). Make sure the Installation/Extraction Tool is aligned parallel to the Vapor Pin® to avoid damaging the barb.
   - During installation, the Vapor Pin® Sleeve may form a slight bulge between the slab and the Vapor Pin® Sampling Device shoulder.
7. Place the Vapor Pin® Cap on the Vapor Pin® to prevent vapor loss prior to sampling (Figure 3).
8. For flush mount installations, cover the Vapor Pin® with a flush mount cover, using either the plastic cover or the optional Stainless Steel Secure Cover (Figure 4).
9. Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

Figure 1.

Figure 2.

Figure 3.

Figure 4.

Sampling

1. Remove the Vapor Pin® Cap and connect your sample tubing to the barb fitting of the Vapor Pin® Sampling Device.
2. Create a connection by using a short piece of Tygon™ tubing to join the Vapor Pin® Sampling Device with the Nylaflow tubing (Figure 5). Put the Nylaflow tubing as close to the Vapor Pin® Sampling Device as possible to minimize contact between soil gas and Tygon™ tubing. You do not **have** to use Nyflaflow tubing, any stiff tubing will suffice.
3. Prior to sampling, conduct a leak test in accordance with applicable guidance. If a leak test is not specified, refer to the SOP Leak Testing the Vapor Pin® Sampling Device, via Mechanical Means (Figure 6). For flush-mount installations, distilled water can be poured directly into the 1½ inch (38mm) hole.

Figure 5.

Figure 6.

Figure 7.

Extraction Procedure & Reuse Notes

1. Remove the protective cap, and thread the Installation/Extraction Tool onto the Vapor Pin® Sampling Device (Figure 7). Turn the tool clockwise continuously, don't stop turning, the Vapor Pin® Sampling Device will feed into the bottom of the Installation/Extraction Tool and will extract from the hole like a wine cork, **DO NOT PULL!**
2. Fill the void with hydraulic cement and smooth with a trowel or putty knife.
3. Prior to reuse, remove the silicon Vapor Pin® Sleeve and Vapor Pin® Cap and discard. Decontaminate the Vapor Pin® Sampling Device in a Alconox® solution, then heat in an oven to a temperature of 265° F (130°C). For Stainless – ½ hour, Brass 8 minutes.

Standard Operating Procedure

Leak Testing the Vapor Pin® Sampling Device Via Water Dam

Scope & Purpose

Scope

The operating procedure describes the methodology to test a Vapor Pin® Sampling Device or equivalent sub-slab sampling device for leakage of indoor air.

Purpose

The purpose of this procedure is to assess the potential for indoor air to leak past the Vapor Pin® Sampling Device.

Equipment Needed

- Water Dam
- Distilled water
- VOC free modeling clay or equivalent
- Vapor Pin® Sampling Device and associated sample tubing

Procedure

1. Drill a ⅝-inch (16mm) hole in the concrete slab and install the Vapor Pin® Sampling Device as per the Standard Operating Procedure (SOP).
2. Clean the slab within a 2-inch radius of the Vapor Pin® Sampling Device to remove dust. Avoid wetting the concrete or wait until the concrete is dry before proceeding and avoid cleaning with VOC-containing substances. A whisk broom or shop vacuum is recommended. Remaining dust can be picked up with a piece of scrap modeling clay.
3. Roll a 1-inch diameter ball of modeling clay between your palms to form a “snake” approximately 7 inches long and press it against the end of the water dam. Push the water dam gently against the slab to form a seal with the concrete.
4. Attach the sample tubing to the top of the Vapor Pin® Sampling Device and pour enough distilled water into the water dam to immerse the base of the Vapor Pin® and the tubing connection at the top of the Vapor Pin® Sampling Device.
5. Purge the sample point as required by the data quality objectives. Concrete will absorb some of the water, which is normal; however, if water is lost to the sub-slab, stop, remove the water from the water dam, and reposition the Vapor Pin® Sampling Device to stop the leakage. Reseat the leak test equipment, if needed.
6. If the Vapor Pin® Sampling Device is installed in the flush-mount configuration, the larger hole can be filled with water in place of the water dam modeling clay.

Figure 1. Water dam used for leak detection