



Remediation and Redevelopment Program

Issues & Trends 2018

April 4, 2018

12:00 – 1:00 p.m.

Dial: 1-855-947-8255

Passcode: 6612 745#



Recent Updates in Wisconsin for Vapor Intrusion

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Questions will be taken during the presentation .

You may also submit questions to
DNRComments@wisconsin.gov



Learning Objectives

- DNR's new VI resources
- Ways to be effective and efficient
 - Screening for VI with good data and drawings
 - Proactive public outreach
 - Measuring site-specific attenuation factors
 - Planning and sampling for VI in new construction
 - Develop performance verification early in design
- Continuing obligations not just at closure



New(er) DNR VI Resources

PROFESSIONAL GUIDANCE

- RR-800 *Addressing Vapor Intrusion at Remediation and Redevelopment Sites in WI*

PUBLIC OUTREACH

- RR-067 *Vapor Intrusion: Info Sheet for Neighbors*
- RR-094 *Mitigation: Protection for Vapor Intrusion*
- VIDEO *Vapor Intrusion 101*
- WEBSITE

RR-067 Initial Info and Contacts

Wisconsin DNR - Vapor Intrusion

Remediation and Redevelopment Program

April 2017



Vapor Intrusion Investigation — Information Sheet for Neighbors

Environmental cleanup activities in your area

An environmental investigation is underway in your neighborhood. Environmental investigations involve many different people, and it can be confusing to know who is doing what and why. The back of this letter includes general information about this project as well as key parties and their contact information. Please feel free to get in touch with these people to ask questions.

Migrating soil gas contamination

When environmental contamination migrates through soil, groundwater, or utility trenches, away from the property it started on, it can affect nearby properties. The party responsible for the source of the contamination is required by state law to investigate and clean up hazardous substances in the environment. They are also responsible for reducing potentially harmful health effects of the contamination at affected properties.

One possible harmful effect occurs when gases (vapors) from underground contamination migrate upward into the indoor air of houses and buildings. Gases in soil can get into buildings through tiny cracks in a foundation or basement wall, utility service lines, sump pumps, etc. This is often referred to as vapor intrusion, and it is similar to how naturally occurring radon gas gets into houses and buildings.

Testing to see if vapor intrusion exists at certain houses and buildings is a standard part of most environmental investigations. Allowing environmental professionals to sample air inside and underneath your house or building will let you know if there are any harmful vapors in the soil gas that could affect your indoor air quality and your health. These samples will be sent to a Wisconsin-certified laboratory for analysis to determine if any follow-up action is necessary.

If there is a soil gas problem at your house or building, the responsible party is required to fix the problem. Often this means that the responsible party will hire contractors and obtain your permission to install a vapor mitigation system on your home or building to prevent soil gases from getting indoors. These are similar to radon mitigation systems found in many homes, but even houses with radon systems should still be tested during the environmental investigation.

Permission may be requested to access your property

Environmental contamination often migrates, and it does not stop at property boundaries. The party responsible for the contamination is required by state law to seek permission to access other properties to investigate how far contamination has migrated.

If access is needed to your property, the responsible party or environmental professional should provide you a written property access agreement to sign. DNR recommends that you grant permission and allow qualified environmental professionals working for the responsible party to sample and test the air inside and underneath your house or building.

We recognize that you may still have questions or concerns. Please contact the environmental consultant or DNR project manager listed on the back with your questions and requests for additional information.

Publication Number: RR-067

dnr.wi.gov, search "vapor intrusion"

Vapor Intrusion Investigation — Information Sheet for Neighbors

DATE _____

SITE NAME & ADDRESS _____

DNR ACTIVITY (BRRTS) NUMBER _____

For more information about this investigation and cleanup project go to dnr.wi.gov and search for "cleanup database" or "RR sites map"

BRRTS on the Web is the DNR's database of contaminated sites

RR Sites Map is the DNR's interactive map of contaminated sites

Enter the activity number or the site address

Enter site address, or zoom in to your neighborhood to find the site

PEOPLE TO CONTACT WITH YOUR QUESTIONS

ROLE	WHAT THEY DO	CONTACT PERSON & COMPANY	PHONE & EMAIL (if available for contact)
Responsible Party	Person or entity responsible for investigating and cleaning up the contamination		
Environmental Consultant	Technical expert hired by Responsible Party or DNR to conduct the investigation and cleanup work		
DNR Project Manager	Regulator and contact person for questions on environmental cleanup status and overall process		
Dept. of Health Services	Contact person for questions on health risks associated with exposure to chemical vapors		

WHO HIRED THE ENVIRONMENTAL CONSULTANT? Responsible Party DNR Other _____

Additional resources on vapor intrusion

For more information on vapor intrusion go to dnr.wi.gov and search for "vapor intrusion"

To view a short video about vapor intrusion go to dnr.wi.gov and search for "vapor intrusion 101"

Checked boxes indicate DNR and DHS fact sheets are enclosed

What is vapor intrusion? Why test for vapor intrusion? Who should I contact about vapor intrusion investigations?

What to expect during vapor intrusion sampling Environmental contamination and your real estate WI Dept. of Health Services handouts

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts. The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to: Equal Opportunity Office, Department of Interior, Washington, D.C. 20240. This publication is available in alternative format (large print, Braille, audio tape, etc.) upon request.

RR-094 Mitigation Factsheet

Wisconsin DNR – Vapor Intrusion



Remediation and Redevelopment Program

February 2018

Mitigation: Protection from Vapor Intrusion

When test results show contaminant vapors (like petroleum or solvent fumes) are present in the air below a building, these vapors can get into the indoor air and present a health risk, even if you cannot smell them. The good news is that vapor mitigation options are available to prevent these contaminant vapors from getting indoors. For more information and list of DNR contacts, go to dnr.wi.gov and search “vapor intrusion”.

The DNR and the Department of Health Services (DHS) recommend that building owners allow installation of vapor mitigation systems when test results show chemical concentrations in the air below or near a building exceed the vapor screening criteria.

Why Should I Allow Vapor Mitigation?

Exposure over time to chemical vapors can have negative health effects and increase cancer risk potential. By allowing a mitigation system to be installed, exposure to these contaminant vapors will be minimized. In addition, most vapor mitigation systems can also protect against exposure to radon (a naturally occurring element known to cause lung cancer) and can lessen the moisture entering through the lower level of a building.

These combined effects will improve the overall air quality inside a home or building, and having a mitigation system in place will demonstrate to future buyers that the building is already protected from these hazards.

What Does Vapor Mitigation Look Like?

Vapor mitigation designs will vary, and will take into consideration the specific layout and needs of a building. In most cases, significant cracks in the floor will be sealed and a sub-slab depressurization system will be installed. Sub-slab depressurization systems are commonly known as radon mitigation systems.

Sub-slab depressurization systems are fairly simple, and involve connecting a fan to a pipe to draw air from the soil beneath the building through a suction point in the floor. This energized fan creates a vacuum that collects air from below the building and vents the chemical vapors to the atmosphere where they are dispersed. A manometer gauge on the pipe shows the fan is drawing a vacuum.

Who Pays for Installation?

When the risk from chemical vapors is discovered as part of an environmental cleanup, the party responsible for the cleanup is also responsible for paying for the design, installation, and start-up of vapor mitigation on affected properties. Start-up of a mitigation system typically requires testing to verify it is working correctly.



TYPICAL INSPECTION CHECKLIST

- ✓ Check manometer gauge for vacuum
- ✓ Check that fan is running
- ✓ Check that vent pipe is clear
- ✓ Check foundation for cracks

Who Pays for Operation and Maintenance?

The responsible party is responsible for any necessary maintenance until the time the environmental cleanup case is “closed” by the DNR. After that, the responsibility for the operation and maintenance transfers to the owner of each affected property.

The amount of time after a mitigation system is installed until a property owner becomes responsible for the maintenance can vary from a few months to many years.

How long is mitigation needed?

In most cases, it is expected that the vapor mitigation system will be a permanent addition to a building. However, in some instances the contaminant vapors beneath the building may decrease to safe levels, and the mitigation system can be removed.

Testing and evaluation by an environmental professional, and review and approval by the DNR may be required before a vapor mitigation system can be turned off permanently. This testing is equivalent to work done during vapor intrusion sampling, explained in the DNR publication, What to Expect During Vapor Intrusion Sampling, (RR-954).

Because testing can carry a high cost, and vapor mitigation systems also protect against exposure to radon, property owners may find it desirable to keep the system operating.

What is expected for maintenance?

Property owners are to be provided a maintenance plan by the system installer or party responsible for the cleanup. The plan should give specific instructions for how to keep the mitigation system running effectively.

The specific instructions for maintenance will vary, but typically includes simple steps such as checking a manometer gauge a few times a year and making sure cracks in the basement are sealed. There may also be a need to replace or repair parts from time to time.

A typical operation and maintenance plan for a sub-slab depressurization system might include:

- Run fan continuously
- Inspect vent pipe for obstructions
- Check vacuum reading on manometer gauge
- Seal any significant cracks in floor
- Keep a log of inspection and repairs

For instructions on how to obtain new copies of a maintenance plan, go to dnr.wi.gov, search “vapor intrusion” and open the Maintenance tab.

What will it cost?

The costs to operate and maintain a mitigation system will vary by property, but generally, electrical costs for a sub-slab depressurization system on a single-family home can be expected to range from \$10 - \$15/month. Replacement and repairs would be in addition to this cost.

Are there people to help with repairs?

Most maintenance can be done as part of standard upkeep by a property owner or caretaker of a building. If professional assistance is needed, the DHS keeps a list of radon mitigation contractors who may have the expertise to assist with larger repairs or remodeling

projects. See the DHS website for a list of contractors in your area: dhs.wisconsin.gov/radon/radon-proficiency.htm

Can I remodel my building?

Yes. However, if changes are made to the size of the building, or the mitigation system will be altered, contact a representative in the DNR’s Remediation and Redevelopment Program before making these changes. (Wis. Admin. Code § NR 727 describes this requirement.) Depending on the situation, written approval may be needed by the DNR prior to completing the work.

It is recommended that an environmental professional test and verify that the vapor mitigation system works correctly after changes are made to the building.

What does the law say?

When maintenance of a vapor mitigation system is necessary for protection from residual contamination, the DNR has authority to specify continuing obligations that require property owners to maintain the mitigation system on their property. This authority is defined in Wis. Stats. § 292.12 and Wis. Admin. Code §§ NR 722.15, and 726.

The continuing obligation responsibilities are explained in Wis. Admin. Code § NR 727.05. Property owners are required to notify purchasers or include the continuing obligations in the lease agreement for the property.

Continuing obligations are tracked in the DNR’s database, and the DNR will conduct audits on these properties to help remind owners to stay in compliance with the maintenance requirements.

Do I have options?

Property owners can choose not to allow installation or not to maintain the vapor mitigation system; however, these choices may subject them to future liability.

Property owners may also wish to negotiate with the responsible party prior to case closure for compensation or to make other arrangements for who will take care of system maintenance. These are private agreements to which the DNR is not a party. However, a copy of any written agreements must be provided to the DNR to keep on file. Additional information can be found in the DNR’s publication, When Contamination Crosses a Property Line (RR-589).

Website: VI for Public

<http://dnr.wi.gov/topic/Brownfields/VaporPublic.html>



Factsheets | **Maintenance Requirements** | **Health**

Vapor mitigation on your property

If the vapor mitigation was required as part of an environmental cleanup under Wis. Stat. ch. 292, the continued operation and maintenance of vapor mitigation can be made a continuing obligation for a property ([Wis. Admin. Code ch. 726](#)), and the current property owner must comply with these requirements ([Wis. Admin. Code ch. 727](#)).

If operation and maintenance of a mitigation system is a continuing obligation on a property, the specific requirements should be included in a letter issued from the DNR, and instructions for care and inspection of the system should be summarized in Maintenance Plan. Both the letter and the maintenance plan should be available at the property.

Who can Help?

Vapor mitigation systems are similar or equivalent to radon mitigation systems. The Wisconsin Department of Health Services (DHS) maintains a list of radon mitigation contractors that have passed national proficiency standards: [Radon Mitigation: Wisconsin Certified Radon Mitigation Contractors](#) [exit DNR]. If help is needed with repairs or replacement of a mitigation system, the DNR strongly suggests work be performed by contractors who have been certified by the [National Radon Proficiency Program \(NRPP\)](#) [exit DNR].

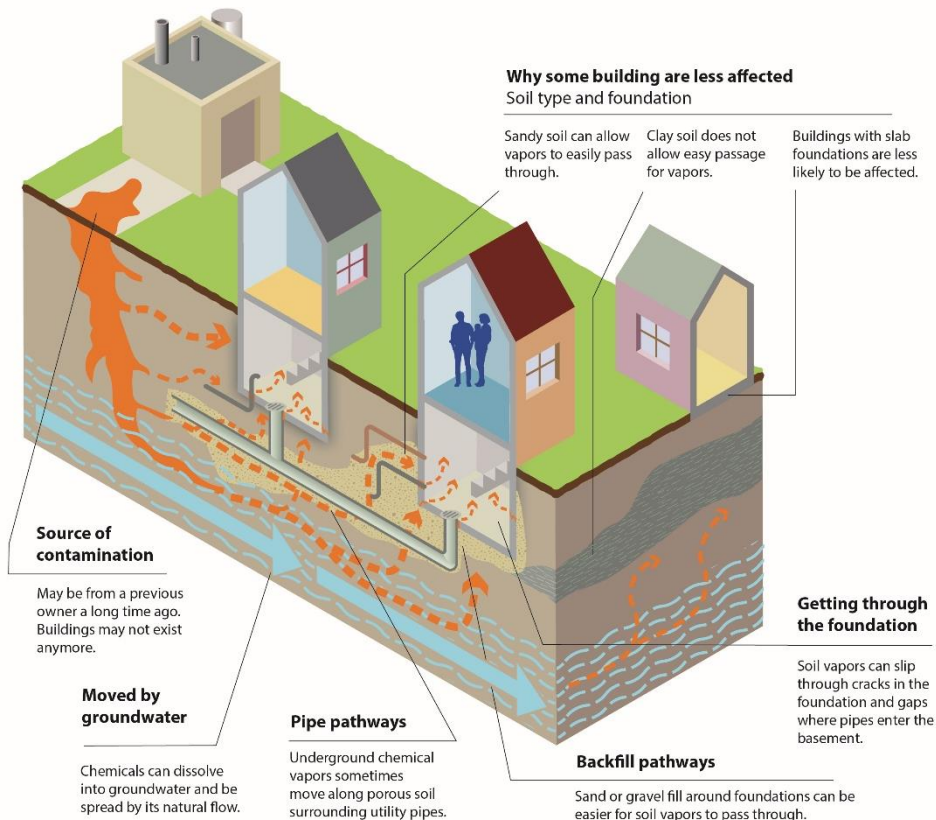
Copies of DNR letter or Maintenance Plan

Electronic copies can be downloaded from [Wisconsin's Remediation and Redevelopment Database \(BRRTS\) on the Web](#). BRRTS on the Web (BOTW) is a database organized by BRRTS Activity number, which is assigned to the property that was the source of the contamination. (Note, your



The manometer measures suction created by the vapor mitigation system fan. The uneven levels of the liquid indicate the system fan is running but cannot be used exclusively to determine the effectiveness of the system.

RR-800 Finalized January 2018



Source: Minnesota Pollution Control Agency

- Draft Comment Period
 - Posted 8/17 to 9/17
 - Listening Sessions
 - Responses Published 1/18
- Section-by-Section Summary of Updates
 - See Training Library
 - View 8/9/17 Webinar

Table of Contents, Tables, and Figures



Don't let the length of the document be intimidating

- Use the Table of Contents
- Tables as a quick reference
- Figures 3a and 3b for screening criteria

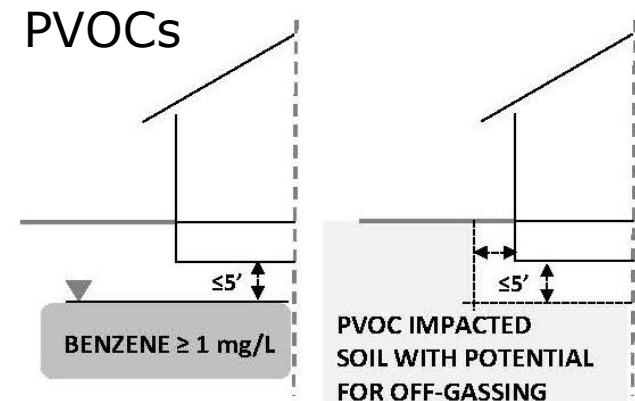
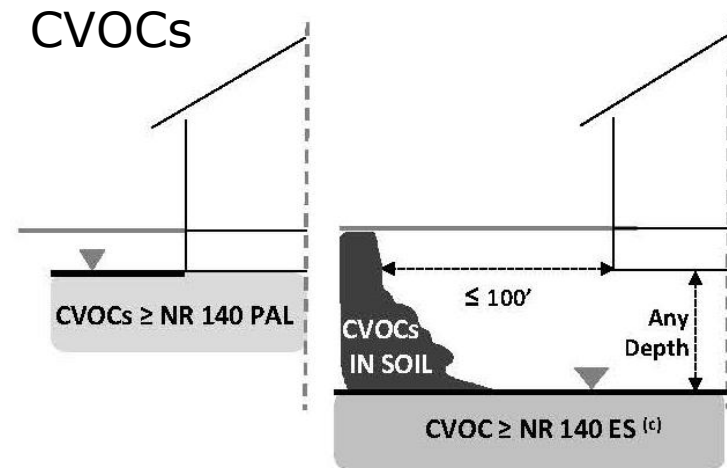


Key Topics

- Screening criteria (Section 3)
- Outreach expectations (Section 4)
- Site-specific attenuation factors (Section 6)
- New Construction (Section 7)
- Mitigation options (Section 8)
- Performance verification (Section 9)
- Continuing Obligations (Section 11)

Vapor Screening (Section 3)

- Drawings very helpful
 - Show screening visually
 - Identify buildings needing SI
 - Rule out areas
- Chlorinated vs. Petroleum
 - CVOCs often need SI
 - PVOCs often screened out
 - Petroleum includes
 - Gas Stations
 - MGP Sites
 - Heating Oil



Outreach (Section 4)

- Access best faith effort
 - At least 2 attempts
 - 3rd try by DNR
 - Document efforts
 - DNR adds note to file
 - Other site specific actions
- Online resources
 - <http://dnr.wi.gov/topic/Brownfields/Vapor.html>
 - Factsheets
 - Template letters
 - Videos



Site Specific Attenuation Factor (Section 6)

- Allowed in non-residential
- Radon tracer test
- Higher sub-slab concentrations may be ok
- Reduces over-engineering
 - Continuing obligation
 - Maintain building conditions
 - Maintain land use



Continuous Radon Monitor

$$\text{Site Specific Attenuation Factor} = \frac{\text{Concentration}_{\text{radon} - \text{indoor air}}}{\text{Concentration}_{\text{radon} - \text{subslab}}}$$

New Construction (Section 7)

- Is remediation of vapor source an option?
Take advantage of opportunities during site redevelopment
- Can buildings be set where there is *not* a vapor risk?
Plan and design creatively early in the redevelopment
- Is mitigation *needed* to address vapor risk?
Collect subslab samples after construction complete
 - Less than VRSL = Mitigation nice to have
 - Over VRSL = Performance verification & long-term O&M required





Mitigation Design Options (Section 8)

Active Depressurization

Preferred for residential

- **Sub-slab**
- Sub-membrane

Active Indoor Controls

Okay in non-residential

- Building Pressurization
- HVAC optimization
- Parking Garage
- Indoor air treatment

Passive Controls

Possible in new construction

- Passive ventilation
- Vapor barrier

Performance Verification (Section 9)

- Define design criteria
- Document installation (if any)
- Test and measure performance metrics
 - Under normal HVAC
 - Over multiple seasons
- Record baseline conditions

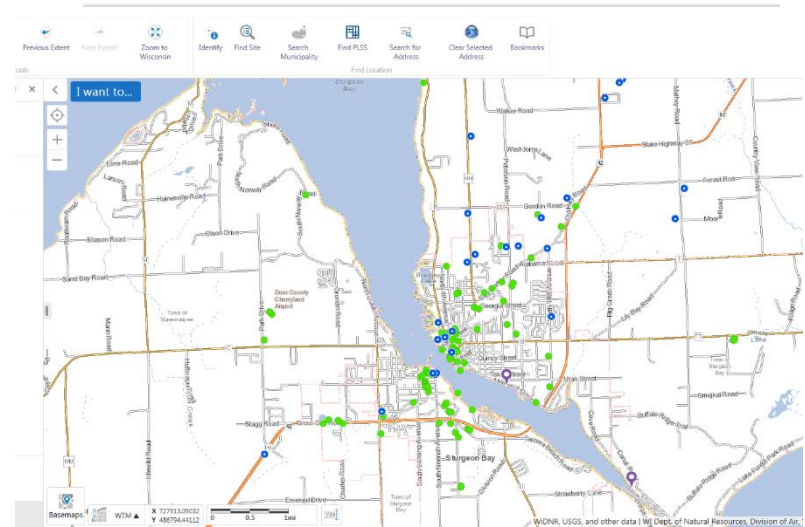


Continuing Obligations (Section 11)

- When can they be imposed?
 - RAP Approval
 - Interim Action Approval
 - Closure Approval
- Property listed in BRRTS
 - Approval letter
 - Maintenance plan
- Removal is possible



RR Sites Map





Takeaway Messages

- DNR has great VI resources
- Ways to be effective and efficient
 - Screen for VI with good data and drawings
 - Proactive public outreach
 - Measure site-specific attenuation factors
 - Plan for VI in new construction
 - Develop performance verification early in design
- Continuing obligations not just at closure



Contact Information

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Audio and information from today's presentation
can be found on the RR Program
Training Webpage at:

<http://dnr.wi.gov/topic/Brownfields/Training.html>

Questions/Comments/Suggestions regarding the
Issues & Trends Series can be submitted to:
DNRRRComments@wisconsin.gov

