



January 16, 2019

Patrick Kelly
4508 Gordon Avenue
Monona, WI 53716

Subject: December 2018 Air Quality Sampling Results
BRRTS#: 02-13-551928

Dear Mr. Kelly:

Thank you very much for allowing us to resample the air quality at your property on December 27-28, 2018. This letter provides you the results of that sampling conducted by EnviroForensics, LLC (EnviroForensics) as part of an environmental investigation being performed for the Klinke Cleaners facility located at 4518 Monona Drive in Madison, Wisconsin. This work is all being performed at the direction of the Wisconsin Department of Natural Resources (WDNR). The chemicals being investigated are tetrachloroethene (PCE) and its associated breakdown products, which was a chemical that was formerly used in the dry cleaning process. That chemical is no longer in use by Klinke Cleaners.

One (1) indoor air sample (designated "6404-4508 Gordon Ave-IA-B") was collected from your home's basement. Two (2) sub-slab vapor samples (designated "6404-4508 Gordon Ave-SSV-1" and "6404-4508 Gordon Ave-SSV-2") were collected from beneath the basement floor. We also collected a sample of outdoor air. A sample location sketch is provided on **Figure 1**.

Sample results are summarized and compared to WDNR standards on the attached **Table 1**. We have also included the laboratory report that relates to the samples. As you will see, there were **no detections** of any of the chemicals of concern in the indoor air sample. As for the vapor beneath your basement slab, although PCE and trichloroethene were detected in one of the samples (at concentrations of 6.50 and 5.10 parts per billion by volume (ppbv), respectively), both results **are well below** the WDNR's residential vapor risk screening levels of 210 and 13 ppbv, respectively. No other chemicals were detected in the sub-slab vapor samples.

This is good news! These sampling results indicate that the risk of vapor intrusion has been eliminated. You can operate the mitigation system fan at your discretion; however, it is no longer needed for PCE vapor mitigation.

If you have any questions or would like to discuss these results, please contact me at 262-290-4001 or by email at bkappen@enviroforensics.com. The WDNR project manager, Mike Schmoller, can also be reached to discuss at 608-275-3303.

Document: 6404-1614
EnviroForensics, LLC
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Phone: 262-290-4001 • Fax 317-972-7875

We greatly appreciate your help and patience with this matter.

Sincerely
EnviroForensics, LLC

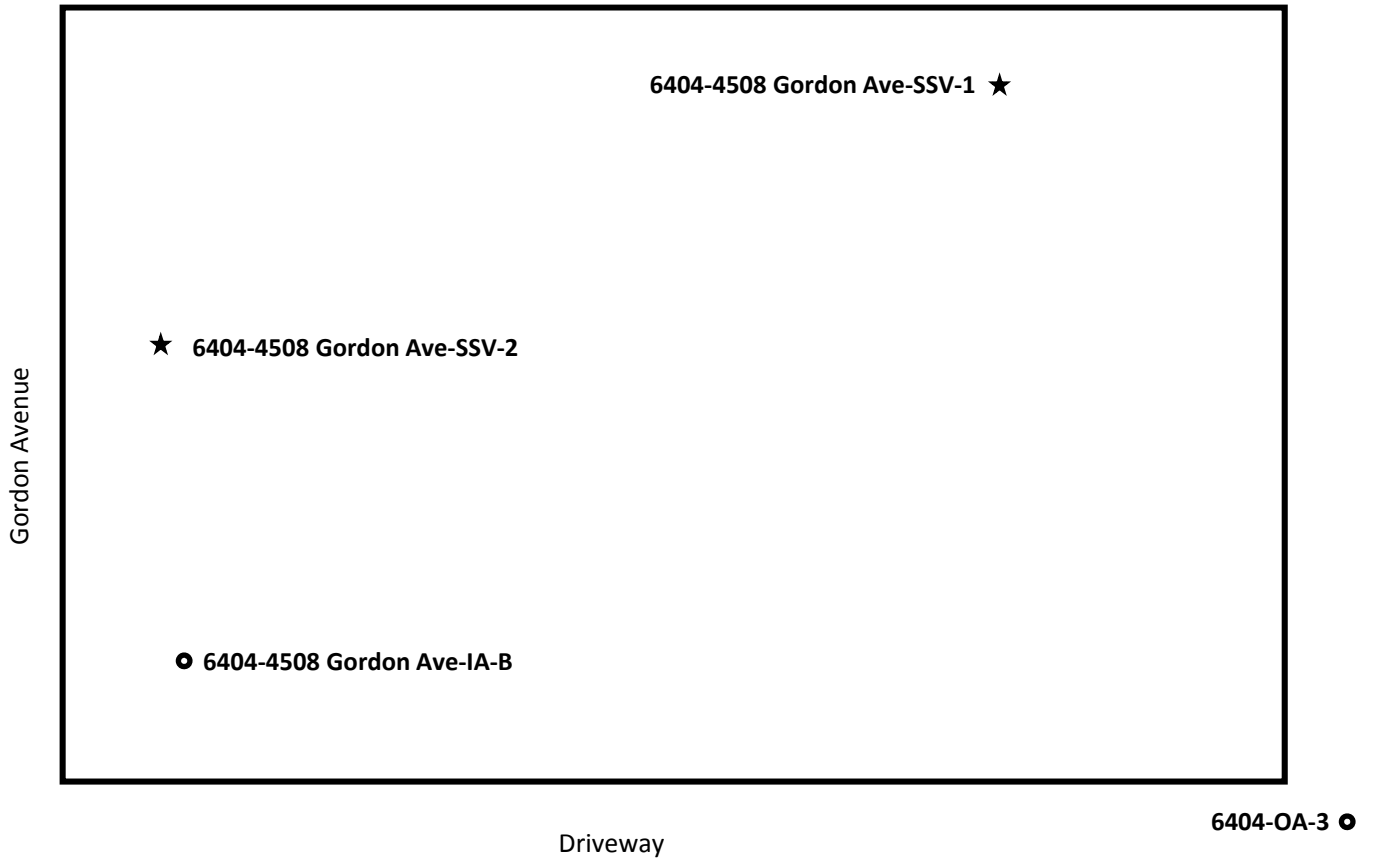
A handwritten signature in blue ink, appearing to read "Brian Kappen".

Brian Kappen, PG
Project Manager

Attachments: Vapor Intrusion Sample Locations
Sample Results Summary Table
Laboratory Analytical Report
RR-977 Understanding Chemical Vapor Intrusion Testing Results

Copy: Mike Schmoller, Wisconsin Department of Natural Resources
Steve Klinke, Klinke Cleaners

FIGURE 1
VAPOR INTRUSION SAMPLE LOCATIONS
4508 Gordon Avenue, Monona, Wisconsin



Legend

- = Indoor/Outdoor Air Sample
- IA-B = Basement
- SSV-1 = Sub-Slab Vapor
- ★ = Sub-Slab Vapor Sampling Port Location



TABLE 1
VAPOR INTRUSION ASSESSMENT ANALYTICAL RESULTS SUMMARY

Klinke Cleaners
4518 Monona Drive, Madison, Wisconsin

Sample Address	Sample Identification	Sample Location	Sample Date	Mitigation (pre/post)	Tetrachloroethene	Trichloroethene
INDOOR/OUTDOOR AIR						
Residential Indoor Air Vapor Action Level					6.2	0.39
4508 Gordon Avenue	6243-4508 Gordon-IA-1	Basement	5/24/2012	pre	1.2	ND
	6243-4508 Gordon-IA-2	1st Floor	5/24/2012	pre	ND	ND
	6243-4508-Gordon-IA-1	1st Floor	2/12/2013	post	ND	ND
	6243-4508-Gordon-IA-2	Basement	2/12/2013	post	ND	ND
	6404-4508 Gordon Ave-IA-B	Basement	10/16/2018	post	<0.47	<0.2
	6404-4508 Gordon Ave-IA-B	Basement	12/28/2018	post	<0.47	<0.2
	6404-OA-3	Outdoor	12/28/2018	post	<0.47	<0.2
SUB-SLAB VAPOR						
Residential Vapor Risk Screening Level					210	13
4508 Gordon Avenue	6243-4508 Gordon-SS-1	Basement	5/24/2012	pre	830	<3.3
	6404-4508 Gordon Ave-SSV-1	Basement	10/16/2018	post	<0.47	<0.2
	6404-4508 Gordon Ave-SSV-2	Basement	10/16/2018	post	1.82	0.27
	6404-4508 Gordon Ave-SSV-1	Basement	12/28/2018	post	6.50	5.10
	6404-4508 Gordon Ave-SSV-2	Basement	12/28/2018	post	<4.7	<2

Notes:

Units in ppbv = parts per billion by volume

Vapor risk screening levels calculated according to the procedures described in WDNR Publication RR-800 and subsequent guidance.

Bolded values are above detection limits

Bolded and shaded values exceed land use specific screening levels

ND = Compound not detected



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Mr. Brian Kappen
Enviroforensics
N16 W. 23390 Stone Ridge Dr
Suite G
Waukesha, WI 53188

January 9, 2019

EnvisionAir Project Number: 2019-3
Client Project Name: 6404

Dear Mr. Vander Heiden,

Please find the attached analytical report for the samples received January 4, 2019. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. EnvisionAir looks forward to working with you on your next project.

Yours Sincerely,

A handwritten signature in black ink that reads "Stanley A. Hunnicutt".

Stanley A Hunnicutt

Project Manager
EnvisionAir, LLC



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Client Name: ENVIROFORENSICS
Project ID: 6404
Client Project Manager: BRIAN KAPPEN
EnvisionAir Project Number: 2019-3

Sample Summary

Canister Pressure / Vacuum

<u>Laboratory Sample Number:</u>	<u>Sample Description:</u>	<u>Matrix:</u>	<u>START</u>	<u>START</u>	<u>End Date</u>	<u>End Time</u>	<u>Date</u>	<u>Time</u>	<u>Canister Pressure / Vacuum</u>		<u>Lab</u>
			<u>Collected:</u>	<u>Collected:</u>					<u>(in. Hg)</u>	<u>(in. Hg)</u>	
19-11	6404-4508 GORDON AVE-IA-B	A	12/27/18	14:38	12/28/18	13:56	1/4/19	11:30	-29	-4	-4
19-12	6404-OA-3	A	12/27/18	14:50	12/28/18	13:51	1/4/19	11:30	-28	-7	-7
19-13	6404-4508 GORDON AVE-SSV-1	A	12/28/18	14:09	12/28/18	14:13	1/4/19	11:30	-23	-2	-2
19-14	6404-4508 GORDON AVE-SSV-2	A	12/28/18	14:17	12/28/18	14:23	1/4/19	11:30	-25	-2	-2



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Client Name: ENVIROFORENSICS

Project ID: 6404

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2019-3

Analytical Method: TO-15
Analytical Batch: 010619AIR(1)

Client Sample ID: 6404-4508 GORDON
 AVE-IA-B

Sample Collection START Date/Time: 12/27/18 14:38
Sample Collection END Date/Time: 12/28/18 13:56
Sample Received Date/Time: 1/4/19 11:30

Envision Sample Number: 19-11
Sample Matrix: AIR

<u>Compounds</u>	<u>Sample Results ppbv</u>	<u>Reporting Limit ppbv</u>	<u>Flag</u>
cis-1,2-Dichloroethene	< 5	5	
Tetrachloroethene	< 0.47	0.47	
trans-1,2-Dichloroethene	< 10	10	
Trichloroethene	< 0.2	0.2	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	118%		
Analysis Date/Time:	1-6-18/20:14		
Analyst Initials	tjg		



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Client Name: ENVIROFORENSICS

Project ID: 6404

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2019-3

Analytical Method: TO-15
Analytical Batch: 010619AIR(1)

Client Sample ID: 6404-OA-3

Sample Collection START Date/Time: 12/27/18 14:50

Sample Collection END Date/Time: 12/28/18 13:51

Envision Sample Number: 19-12

Sample Received Date/Time: 1/4/19 11:30

Sample Matrix: AIR

<u>Compounds</u>	<u>Sample Results ppbv</u>	<u>Reporting Limit ppbv</u>	<u>Flag</u>
cis-1,2-Dichloroethene	< 5	5	
Tetrachloroethene	< 0.47	0.47	
trans-1,2-Dichloroethene	< 10	10	
Trichloroethene	< 0.2	0.2	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	91%		
Analysis Date/Time:	1-6-18/19:02		
Analyst Initials	tjg		



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Client Name: ENVIROFORENSICS

Project ID: 6404

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2019-3

Analytical Method: TO-15
Analytical Batch: 010819AIR

Client Sample ID: 6404-4508 GORDON
 AVE-SSV-1

Sample Collection START Date/Time: 12/28/18 14:09
Sample Collection END Date/Time: 12/28/18 14:13
Sample Received Date/Time: 1/4/19 11:30

Envision Sample Number: 19-13
Sample Matrix: AIR

<u>Compounds</u>	<u>Sample Results ppbv</u>	<u>Reporting Limit ppbv</u>	<u>Flag</u>
cis-1,2-Dichloroethene	< 50	50	
Tetrachloroethene	6.50	4.7	
trans-1,2-Dichloroethene	< 100	100	
Trichloroethene	5.10	2	
Vinyl Chloride	< 5	5	
4-bromofluorobenzene (surrogate)	115%		
Analysis Date/Time:	01-08-19/10:51		
Analyst Initials	tjg		



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Client Name: ENVIROFORENSICS

Project ID: 6404

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2019-3

Analytical Method: TO-15
Analytical Batch: 010619AIR(2)

Client Sample ID: 6404-4508 GORDON
 AVE-SSV-2

Sample Collection START Date/Time: 12/28/18 14:17
Sample Collection END Date/Time: 12/28/18 14:23
Sample Received Date/Time: 1/4/19 11:30

Envision Sample Number: 19-14
Sample Matrix: AIR

<u>Compounds</u>	<u>Sample Results ppbv</u>	<u>Reporting Limit ppbv</u>	<u>Flag</u>
cis-1,2-Dichloroethene	< 50	50	
Tetrachloroethene	< 4.7	4.7	
trans-1,2-Dichloroethene	< 100	100	
Trichloroethene	< 2	2	
Vinyl Chloride	< 5	5	
4-bromofluorobenzene (surrogate)	108%		
Analysis Date/Time:	1-8-19/11:24		
Analyst Initials	tjg		

TO-15 Quality Control Data

EnvisionAir Batch Number: 010619AIR(1)

<u>Method Blank (MB):</u>	<u>MB Results (ppbv)</u>	<u>Reporting Limit (ppbv)</u>	<u>Flags</u>
cis-1,2-Dichloroethene	< 5	5	
Tetrachloroethene	< 0.47	0.47	
trans-1,2-Dichloroethene	< 10	10	
Trichloroethene	< 0.2	0.2	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	84%		
Analysis Date/Time:	1-6-18/18:29		
Analyst Initials	tjg		

<u>LCS/LCSD</u>	<u>LCS Results (ppbv)</u>	<u>LCSD Results (ppbv)</u>	<u>LCS/D Conc(ppbv)</u>	<u>LCS Rec.</u>	<u>LCSD Rec.</u>	<u>RPD</u>	<u>Flag</u>
Vinyl Chloride	10.2	10.2	10	102%	102%	0.0%	
trans-1,2-Dichloroethene	11.2	10.5	10	112%	105%	6.5%	
cis-1,2-Dichloroethene	11.2	10.4	10	112%	104%	7.4%	
Trichloroethene	9.91	10.9	10	99%	109%	9.5%	
Tetrachloroethene	9.6	10.5	10	96%	105%	9.0%	
4-bromofluorobenzene (surrogate)	106%	118%					
Analysis Date/Time:	1-6-18/17:18	1-6-18/19:40					
Analyst Initials	tjg	tjg					

TO-15 Quality Control Data

EnvisionAir Batch Number: 010619AIR(2)

<u>Method Blank (MB):</u>	<u>MB Results (ppbv)</u>	<u>Reporting Limit (ppbv)</u>	<u>Flags</u>
cis-1,2-Dichloroethene	< 5	5	
Tetrachloroethene	< 0.47	0.47	
trans-1,2-Dichloroethene	< 10	10	
Trichloroethene	< 0.2	0.2	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	93%		
Analysis Date/Time:	1-7-19/17:55		
Analyst Initials	tjg		

<u>LCS/LCSD</u>	<u>LCS Results (ppbv)</u>	<u>LCSD Results (ppbv)</u>	<u>LCS/D Conc(ppbv)</u>	<u>LCS Rec.</u>	<u>LCSD Rec.</u>	<u>RPD</u>	<u>Flag</u>
Vinyl Chloride	10.2	10.6	10	102%	106%	3.8%	
trans-1,2-Dichloroethene	11.1	11.2	10	111%	112%	0.9%	
cis-1,2-Dichloroethene	10.8	10.8	10	108%	108%	0.0%	
Trichloroethene	9.62	10.9	10	96%	109%	12.5%	
Tetrachloroethene	10.1	10.3	10	101%	103%	2.0%	
4-bromofluorobenzene (surrogate)	99%	104%					
Analysis Date/Time:	1-7-19/17:20	1-7-19/19:07					
Analyst Initials	tjg	tjg					



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Flag Number

Comments



Understanding Chemical Vapor Intrusion Testing Results

From the Lab to You

Chemical vapor samples were taken from underneath your house or building and possibly indoors as well. These samples have been tested by a certified laboratory and a report was issued. The Wisconsin Department of Natural Resources (DNR) uses these test results to determine if people in the building are being exposed to chemical vapors coming from nearby contaminated soil or groundwater, and to decide what, if any, action is needed to prevent this exposure.

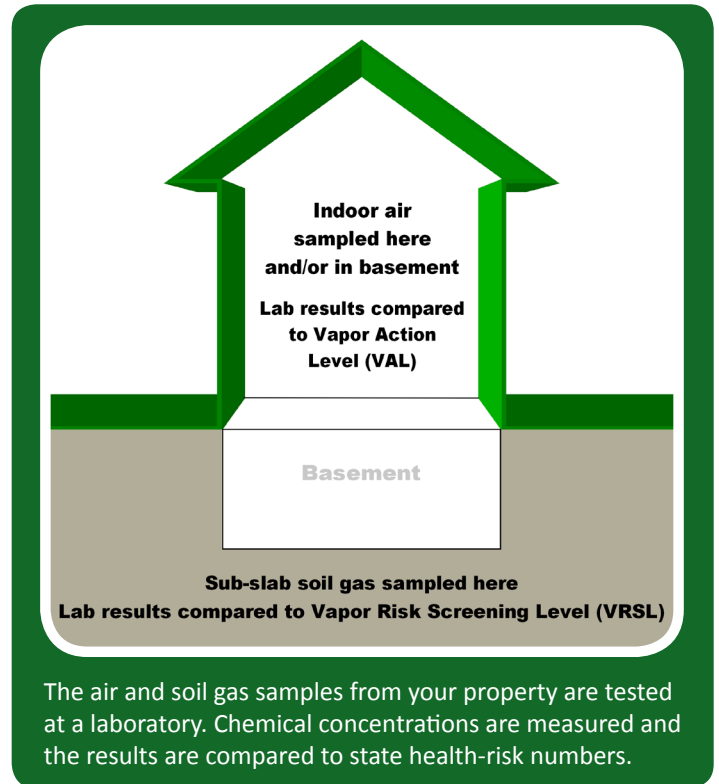
Indoor Air Testing Results

If indoor air samples were collected in your house or building, test results from the lab will be compared to the state Vapor Action Level (VAL) for chemicals of concern. The VAL is a chemical compound's numerical value that represents a health hazard risk to no more than 1 in 100,000 people during a lifetime of exposure. If test results show chemical concentrations in your air below the VAL then adverse health effects are extremely rare, even if you were to breathe the chemical at this concentration for your entire life.

Test results showing chemical concentrations in the air at or above the VAL prompt DNR to recommend that exposure to these chemical vapors be reduced. If test results show concentrations significantly above the VAL, or more than one type of chemical vapor is identified in your indoor air, the risk from exposure increases. If the concentration of any indoor chemical vapor greatly exceeds the VAL, DNR is concerned about even short-term exposure and will typically require immediate action to address the problem.

The VAL for each chemical is set by scientific research. It is protective of all people, including those who are most susceptible to adverse health effects.

If test results identify chemicals in your air that are not present in nearby soil or groundwater contamination, it is likely that these vapors are coming from some product or activity in or near your house or building. Many everyday consumer products (e.g., cleaners, solvents, polish, adhesives, lubricants, aerosols, insect repellants, etc.); combustion processes (e.g., smoking, home heating); fuels in attached garages; dry cleaned clothing or draperies; and occupant activities (e.g., craft hobbies), also release chemical vapors into the air.



Sub-slab Soil Gas Testing Results

Soil gas samples were collected from the ground beneath the concrete slab of your building foundation or basement. The lab measured the concentrations of various chemicals in these samples. DNR compares these measurements to the state Vapor Risk Screening Level (VRSL), which identifies the concentration of a chemical in soil gas that scientific research suggests can be a health risk if vapor enters a building. If soil gas measurements exceed the VRSL for a chemical of concern, action to reduce exposure is strongly recommended.

The VRSL is a higher number (higher chemical concentration) than the VAL because it is presumed that concrete building foundations and basement walls will prevent most soil gas from entering a building. Further, any soil gas that does enter a building through cracks, holes, sump pumps, drains, etc., will be diluted to some extent by the indoor air. So, people inside will not be breathing air that includes the full concentration of chemical vapors that exist in the ground.



DNR generally relies on the test results of the sub-slab soil gas samples when determining what, if any, action should be taken related to chemical vapors coming from nearby soil or groundwater contamination. Indoor air quality is highly variable, and it is difficult to make a definitive decision about vapor intrusion based on indoor air sampling alone.

Follow-Up Actions

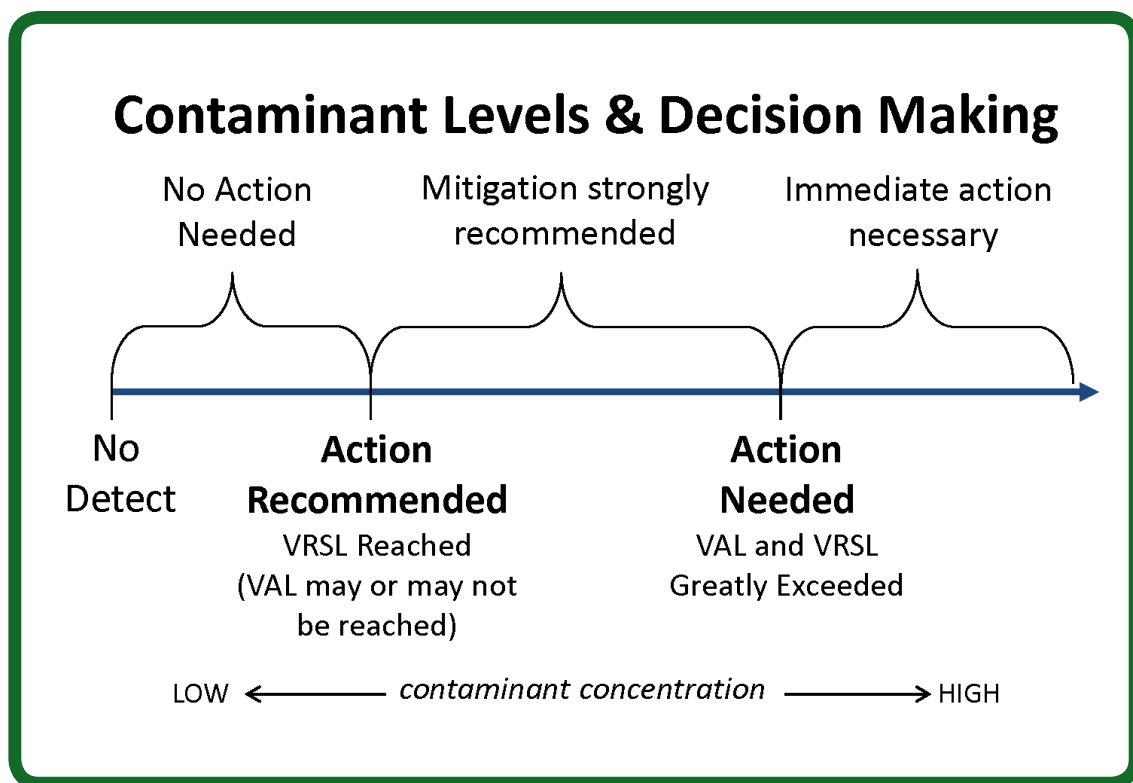
If your test results are less than a VAL for indoor air, or a VRSL for sub-slab soil gas, then the air in the house or building should not present a health concern. Follow-up sampling and testing may be necessary to confirm the results, but no other action is typically suggested.

When test results show soil gas chemical concentrations above a VRSL, both DNR and the Wisconsin Department of

Health Services recommend that owners take action to reduce potential exposure. This typically involves installing a vapor mitigation system that vents chemical vapors from beneath your home or building to the outdoors, similar to a radon mitigation system.

If indoor air concentrations exceed a VAL, but sub-slab concentrations are less than a VRSL, then the chemical vapors are most likely coming from indoor sources. Steps should be taken by the house or building owner to identify the products and practices causing the problem and implement appropriate remedies.

If soil gas mitigation is recommended, a representative of the party who is responsible for the soil or groundwater contamination will contact you to discuss your options.



A Note about Measurement Units: The lab report may include some unfamiliar technical language. The most important point to note is whether or not the test result for a specific chemical exceeds a VAL or VRSL, which are also sometimes referred to, generically, as “screening levels.”

The concentration of gaseous pollutants in air is typically described in two different ways: 1) as units of mass per volume, where $\mu\text{g}/\text{m}^3$ represents micrograms of gaseous pollutant per cubic meter of ambient air; and 2) as parts per billion by volume (ppbv), where the volume of a gaseous pollutant is compared to a set volume of ambient air. These are the numbers that are compared to the VAL and VRSL.

For more information, visit dnr.wi.gov/topic/Brownfields/Vapor.html