

# CONSULTANTS' DAY 2015

20th Anniversary  
DNR's  
Remediation  
& Redevelopment  
Program

## Site Investigations: Common Mistakes and Helpful Hints

### Vapor Intrusion

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Wisconsin DNR



Hosted by DNR's  
Remediation & Redevelopment Program



# Key Points



- Conceptual Site Model:
  - Do your facts fit your story?
- Screening the PVI pathway:
  - When is a full investigation needed?
- Sub-slab sampling:
  - Why not just test indoor air?
- Vapor mitigation:
  - OMM: who's responsibility?



# Sleuthing for Vapors



# Sleuthing for Vapors

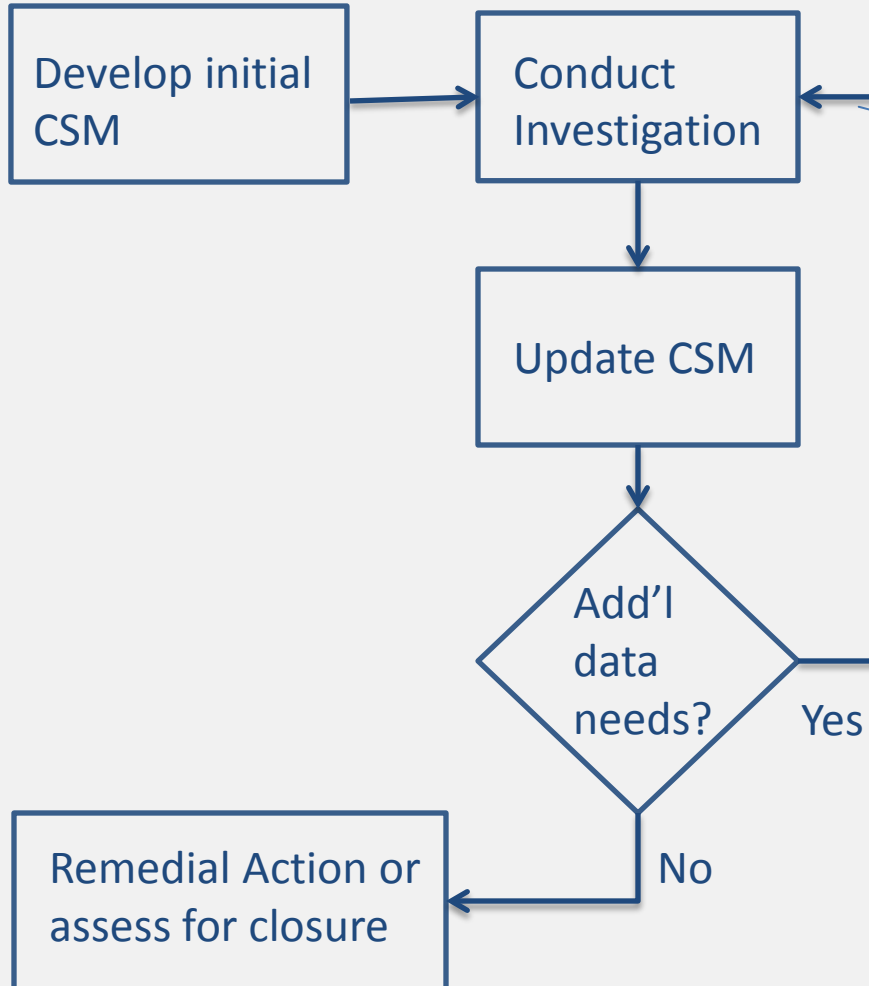


**CSM:**  
**Wisconsin**

**CSI:**  
**Miami**



# CSM Guides Investigation



- Plan investigation based on site-specific conditions
- Collect data to characterize site and to assess vapor pathway (soil gas, sub-slab vapor, etc.)
- Refine CSM
- Update CSM. If necessary, collect more data.



PN 2518WC

MW-29

MW-28

MW-27

MW-30

MW-31

MW-34

MW-35

MW-33

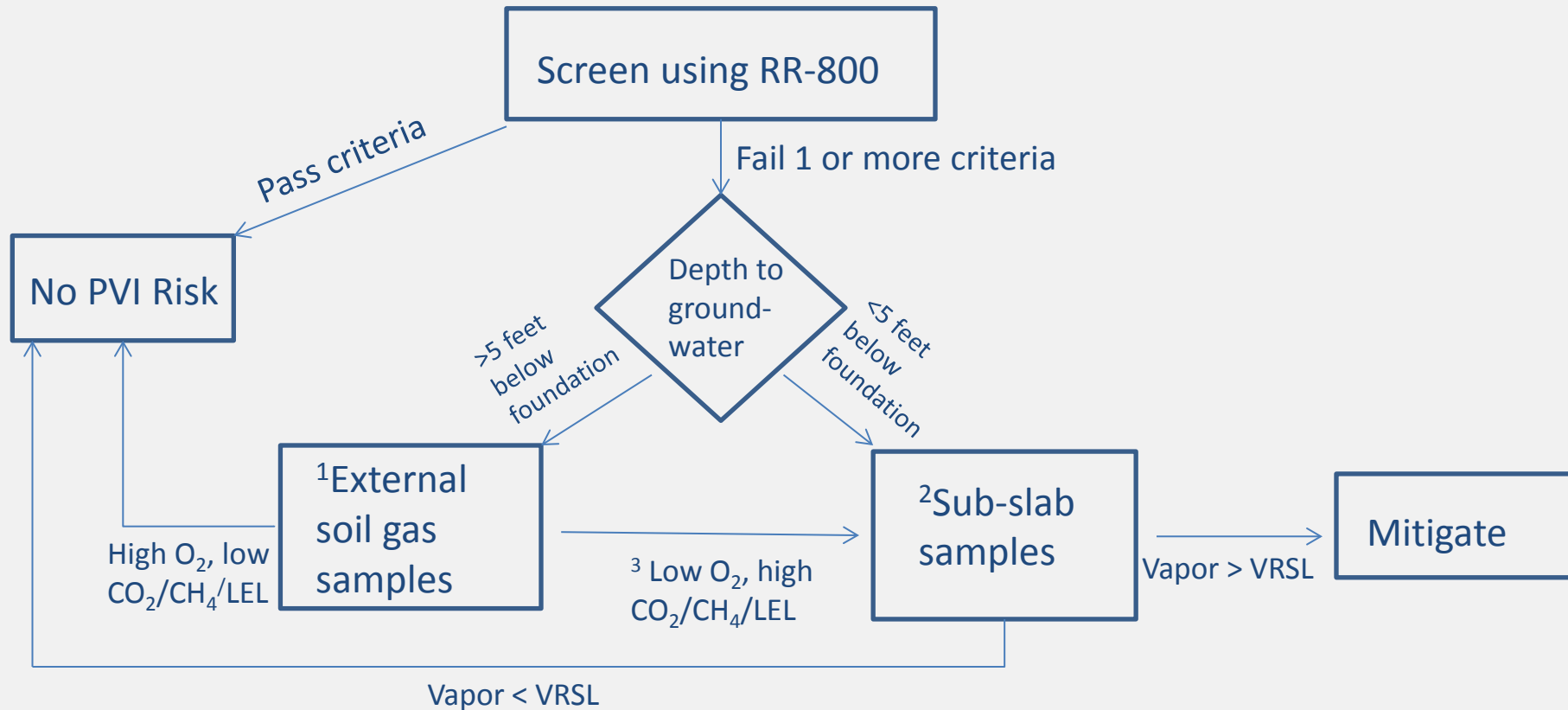
MW-32

MW-36

MW-37

8th Ave

# Screening/Investigating Petroleum VI



<sup>1</sup> O<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>, LEL usually collected

<sup>2</sup> O<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>, LEL + Summa Canister for PVOC; others if needed (1,2-DCA)

<sup>3</sup> Low O<sub>2</sub> < 5% ; high CH<sub>4</sub> ≥ 0.5%; LEL ≥ 10%

# Separation Screening Distances

## Petroleum VI Risk



Screening Criteria	RR-800	ITRC PVI Guidance
NAPL, horizontal distance from foundation	30 feet	30 feet
NAPL, vertical distance from foundation	30 feet	15 feet
Benzene dissolved in groundwater > 1ppm	20 feet	5 feet
Aerated / biologically active soil zone around foundation	5 feet	5 feet



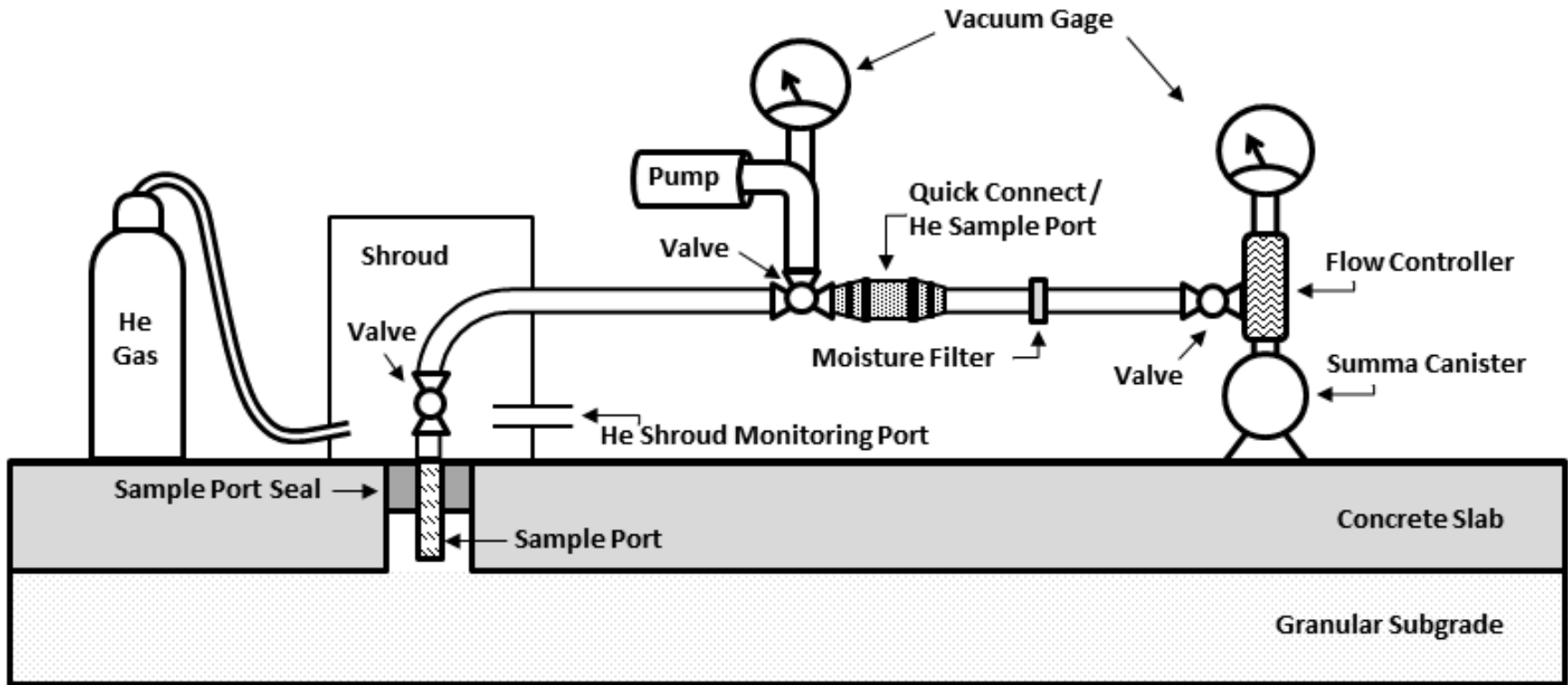
# Why Sub-slab Samples?



- Identify where vapors pose a risk to a building
- Indoor air alone not adequate to ID vapor intrusion
- External soil gas sampling can mislead conclusion of risk
- Proper management of building in the future



# Sub-Slab Vapor Sampling Procedures



RR-986, Sub-Slab Vapor Sampling Procedures

# Sub-Slab Vapor Sampling Procedures



- When should multiple sub-slab sampling rounds\* be collected?
  - Residential – in most situations
  - Commercial – depends on use
  - Industrial – if HPV method used, one round sufficient

\*RR-986, Sub-slab Vapor Sampling Procedures



# Responding to Sub-slab VRSL Exceedance



- VMS almost always installed in residential settings
- Commercial/industrial settings.  
If VMS NOT proposed:
  - Justify alternative approach
  - Additional data usually needed



# Vapor Mitigation Systems



- Hire contractors experienced in vapor mitigation
- Design system prior to installation
  - Single family homes vs. commercial/industrial
- Document system performance



# Vapor Mitigation Systems and OMM Responsibilities



- RP's responsibility for vapor mitigation systems (VMS) found in NR 724
  - Design, implementation, operation, maintenance and monitoring requirements

\*Summary of Changes to the ch. NR 700 Series of Administrative rules (RR-965)

<http://dnr.wi.gov/files/PDF/pubs/rr/RR965.pdf>



# Vapor Mitigation Systems and OMM Responsibilities



- Notification of Property Owners
  - Provide adequate information early in process to property owners re: expected long-term OMM responsibilities



# Existing Underground Parking Garages & Vapor Assessment



- Does the existing parking structure protect the VI pathway? DO NOT assume it does.
  - Ventilation rate
  - Control of the ventilation system
  - Pressure difference between garage & occupied space
  - Elevator shafts





# Guidance Documents Relevant to VI



- [VI Internet page](#)
- [RR-800](#), Addressing VI at Remediation & Redevelopment Sites in WI
- [RR-986](#), Sub-slab Vapor Sampling Procedures



# Summary of Key Points



- **Conceptual Site Model:**
  - Update with new data
- **Screening the PVI pathway:**
  - Majority of sites will not pose VI risk
- **Sub-slab sampling:**
  - Critical to identify buildings at risk of VI
- **Vapor mitigation:**
  - Plan & implement OMM from beginning



# Questions & Contacts

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**Thank you for attending  
Consultants' Day**

