



**U.S. EPA “State of VI Science” Workshop  
Selecting Sampling Strategies for Efficient &  
Economical Vapor Intrusion Site Assessment & Long-  
Term Management – forming Soil Gas Safe Communities**

***Agenda and Workshop Themes/Goals***

**Brian Schumacher  
USEPA ORD**

*32<sup>nd</sup> Annual International Conference on Soil, Water, Energy, and Air, A Hybrid Conference, March 21<sup>nd</sup>, 2023*



PRAXIS ENVIRONMENTAL TECH. INC



# Key Points and Themes

- Efficient & Economical Vapor Intrusion Site Assessment & Long-Term Management
  - Verifying Cleanups Near Receptors
- Three distinct areas that need to be addressed
  - Challenges & Barriers
  - Exposure Pathways
  - New Tools for more Verifiable Cleanups Near Receptors



# Key Points and Themes

- Challenges & Barriers
  - Social
    - Access to land and/or building/residence
  - Technical
    - Variability – spatial and temporal
  - Economic
    - How many samples, where, and when



# Key Points and Themes

- Exposure Pathways
  - Rn
  - Groundwater
  - Vapor intrusion
    - Full pathway
    - Soil gas
- Exposure time



# Key Points and Themes

- New Tools for more Verifiable Cleanups Near Receptors
  - Long term stewardship focus
- Tools can be statistical, economical, mitigation, chemical, and use of I&T
- Rethinking how we use current tool box



# Agenda Overview

- Three different sections each answering a question related to vapor intrusion
  1. Nature and severity of the problem
  2. Do we have a better way of site assessment
  3. Do we have a better way of long-term stewardship
- For each section:
  - Presentations followed by a moderated panel discussion



# Agenda Overview

- Nature and severity of the problem
  - State and Regional Practices
  - Case studies of financial risk and potential lost business from VI litigation
  - Sampling strategy performance: daily and weekly durations
- Alana Lee to moderate panel discussion

Session	Start Time	End Time	Presenter (s)	Presentation Title
Workshop 04 Part 1: U.S. EPA State of Vapor Intrusion Science	8:30 AM	8:55 AM	Henry Schuver	Introduction – Verifying Cleanups Near Receptors
	8:55 AM	9:05 AM	Brian Schumacher	Workshop agenda and themes and goals
	9:05 AM	9:15 AM	Chris Lutes & Laurent Levy	State and Regional Vapor Intrusion Site Assessment Guidance (As of Fall 2022)
	9:15 AM	9:30 AM	Theresa Gabris	Why go “above and beyond” to collect defensible VI data?
	9:30 AM	9:45 AM	Chris Lutes, AJ Kondash, Chase Holton	Sampling Strategy Performance: Daily and Weekly Durations: Comparing Random, Seasonal and Indicator- & Tracer-Guided
	9:45 AM	10:00 AM	Pre-primed discussants: Alana Lee moderates	Panel/Discussants: Nature and severity of the problem
	10:00 AM	10:30 AM	Coffee Break	
	10:30 AM	10:50 AM	Emma Luo	Vapor Intrusion Assessment with Different Foundation Types
	10:50 AM	11:10 AM	Mark Kram, Blayne Hartman, Cliff Frescura	Automated Continuous High-Frequency Vapor and Controlling Factor Monitoring for Reasonable Maximum Exposure, Cost Effective Decision Making, and Risk Reduction
	11:10 AM	11:35 AM	John Zimmerman, Alan Williams, Brian Schumacher	ORD Vapor Intrusion Research Projects Update
	11:35 AM	12:00 PM	Keri Hallberg, Loren Lund, Chris Lutes, Laurent Levy, Donna Caldwell, Travis Lewis, and Teresie Walker	Prioritizing Buildings/Zones Using a Quantitative Decision Framework and Incorporating Indicators/Tracers into Vapor Intrusion Building Assessments
	12:00 PM	1:30 PM	Lunch Break	
Workshop 04 Part 2: U.S. EPA State of Vapor Intrusion Science	1:30 PM	1:50 PM	Pre-primed discussants: Alana Lee moderates	Panel/Discussants: Do we have a better way of site assessment and site management?
	1:50 PM	2:05 PM	Kyle Hoylman	Examples of Spatial Variability in Indoor Radon Concentrations in Multifamily and Large Building Project Sites / Overview of IDOH Mitigation Compliance Inspection Pilot Program
	2:05 PM	2:15 PM	Chris Lutes, Chase Holton	Why Does the Radon Tracer Not Work All the Time?
	2:15 PM	2:40 PM	Riley Mulhern, Chris Lutes, Chase Holton, AJ Kondash	Understanding relationships between indicators & tracers and vapor intrusion: Dynamic multivariate time series regressions
	2:40 PM	3:00 PM	Bo Stewart	SVE as a tool for soil gas management in neighborhoods
	3:00 PM	3:30 PM	Coffee Break	
	3:30 PM	4:00 PM	Chris Lutes, Elsy Escobar, Bo Stewart	Economic Analyses of Long-Term Stewardship: Balancing Investigation, Mitigation and Remediation Decisions
	4:00 PM	4:20 PM	Dave Folkes	Long-term Stewardship of Residential Mitigation Systems by Radon Monitoring: Empowering Homeowners to Help Ensure Continued Mitigation System Performance
	4:20 PM	4:50 PM	Pre-primed discussants: Chase Holton moderates	Panel/Discussants: Do we have a better way of long-term stewardship
	4:50 PM	5:30 PM	Open Discussion: AJ Kondash moderates	Can we see consensus on path forward on improved implementation
	5:30 PM	6:00 PM	Henry Schuver	Closing Remarks - Open Q&A





# Agenda Overview

- Do we have a better way of site assessment and site management?
  - VI assessment with multiple foundation types
  - Automated continuous high-frequency vapor and controlling factor monitoring for RME, cost effective decision making, and risk reduction
  - Results from a new long-term monitoring study in commercial buildings in Fairbanks, AK + update on soil gas safe concept and testing
  - Using a quantitative decision framework to prioritize building/zones for sampling and then incorporating I/T into priority building sampling
- Alana Lee to moderate panel discussion

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	5:30 PM	6:00 PM	Henry Schuver	Closing Remarks - Open Q&A



# Agenda Overview

- Do we have a better way of long-term stewardship?
  - Examples of Spatial Variability in Indoor Radon Concentrations in Multifamily and Large Building Project Sites / Overview of IDOH Mitigation Compliance Inspection Pilot Program
  - Why do certain tracers not work all the time
  - Multivariate analysis of causes of temporal variability
  - SVE as a tool for soil gas management in neighborhoods
  - Economic analysis of long-term stewardship
  - Case studies of radon for long-term stewardship of mitigation systems
- Chase Holton to moderate panel discussion

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- Wrap-up the Day Discussion
  - Can we see consensus on a path forward on improved implementation?
- AJ Kondash to moderate open discussion