PDHonline Course C294 (3 PDH)

Vapor Intrusion - ASTM E2600 Overview

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VAPOR INTRUSION: UNDERSTANDING THE NEW ASTM STANDARD

2008 Vapor Intrusion Training Series

Environmental Data Resources Inc.

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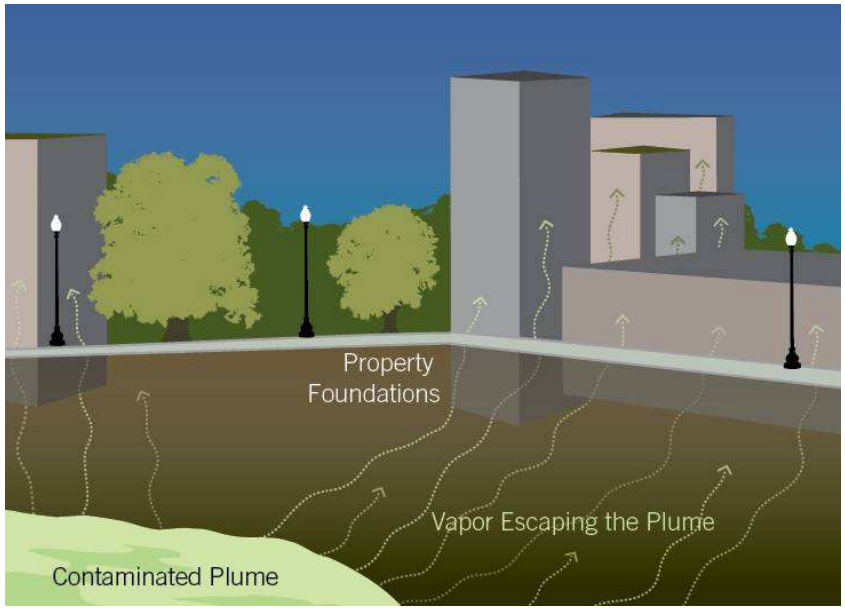
Today's Agenda

- **Welcoming Comments**
  - ***Dianne Crocker***
    Managing Director, EDR's Market Research Group
- **ASTM E 2600-08 Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions**
  - ***Anthony Buonicore, P.E., BCEE, QEP***
    Chairman, ASTM Vapor Intrusion Task Group
- **Closing Comments**
  - ***Dianne Crocker***
- **Q&A**

Welcoming Comments

- EDR's Role
- Recent Developments
- Today's Webinar
- EDR's VI Training Series



ASTM E 2600-08 Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions

by

Anthony J. Buonicore, P.E., BCEE, QEP
Chairman, ASTM Vapor Intrusion Task Group

for presentation at

EDR Vapor Intrusion Webinar
March 19, 2008

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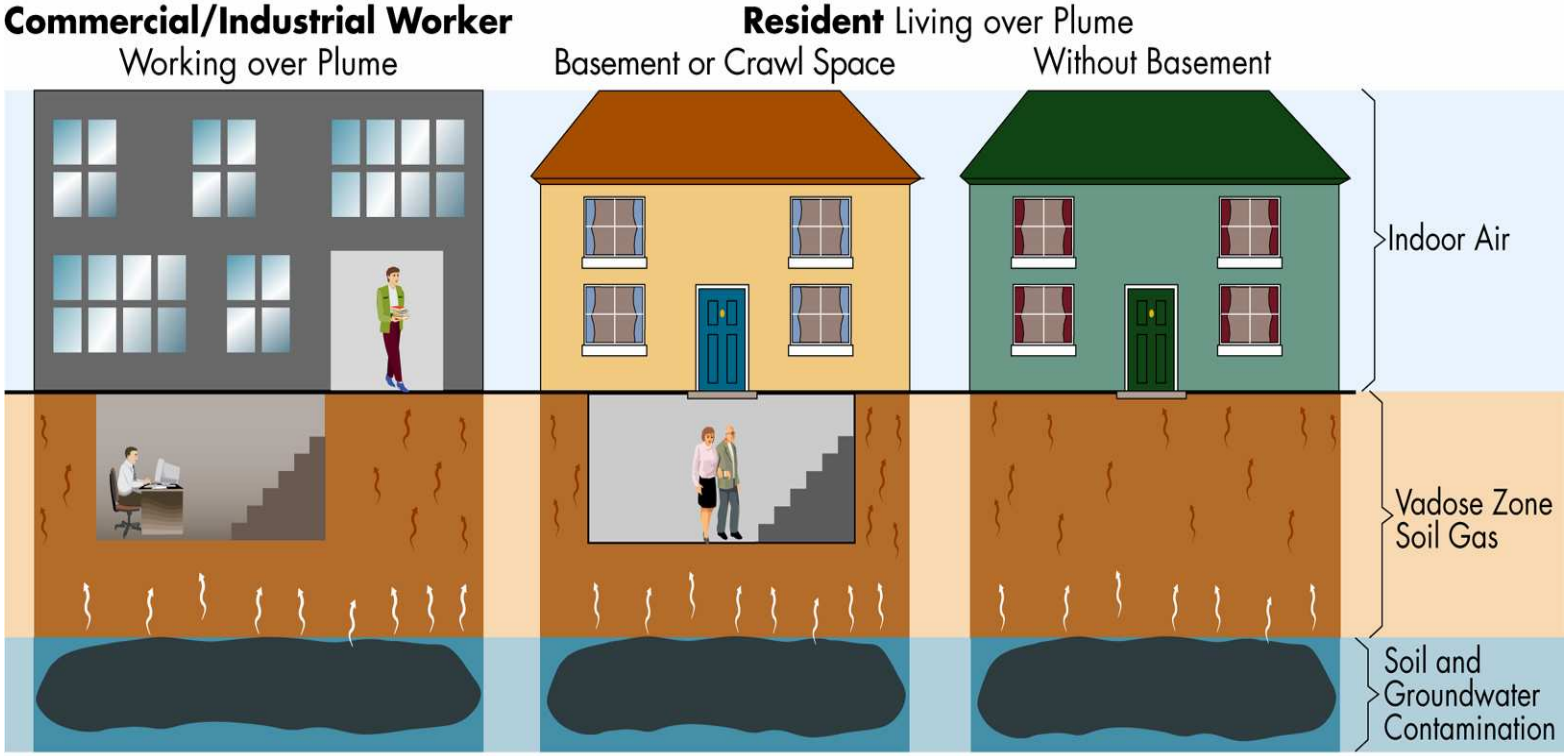
What is vapor intrusion?



Migration of plume vapors to indoor air

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Overview

- Industry-Driven Standard
- Overview of ASTM Standard
- Tiered Methodology
- VI Screening
- Q&A

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Industry-Driven Standard

- Prospective/Current/Past Property Owner
- Phase I Environmental Consultant
- Attorney for the Deal
- Property Lender
- Property Insurer

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Prospective/Current Property Owner Liability

- Properties with NFA letters (“closed sites”) are being re-opened in NY, CA, ME, NJ and elsewhere because of potential vapor intrusion issues
- Further investigation and expense may be required
- Potential liability arising from tenant suits
- Tenant losses (leaving the property – breaking leases)
- Inability to attract new tenants
- Stigmatized property – devaluation?
- Toxic tort potential

Past Property Owner Liability

- **Lawsuits by current property owner against past property owner (who sold property) for:**
  - **non-disclosure**
  - **misrepresentation**

Phase I Env. Consultant Liability

- Litigation growing against environmental professionals who when they conducted their Phase I did not consider the possibility of vapor intrusion creating an indoor air quality issue

Confusion in the Marketplace Created by E 1527

- **ASTM E 1527-05, Section 1.1.1, REC definition…*"means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release…or a material threat of a release…into structures on the property…not intended to include de minimis conditions"***
- ***"release"* is not defined**

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Confusion in the Marketplace cont'd

- **ASTM E 1527-05, Section 13, Non-Scope Considerations:**

  "Following [is a]… non-scope consideration that persons may want to assess:…

  13.1.5.12 Indoor air quality"

- **Vapor intrusion is an issue associated with indoor air quality**
- ***"Indoor air quality"* is not defined**

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Attorney

- Desires Defenses to CERCLA liability for client
- CERCLA addresses air emissions
- Confusion over indoor air responsibility: OSHA versus EPA?
- Does AAI mean VI needs to be considered in the Phase I?
- Confusion in ASTM E 1527-05 with respect to VI (same as for consultants)

Lender Liability

- Adverse impact on property (collateral) value
- Potential negative impact on borrower's creditworthiness and ability to repay loan
- Foreclosure complications

Insurance Company

- More “re-opener policy” claims
- More “property pollution liability policy” claims
- More E&O claims to defend on behalf of Phase I consultants being sued
- More toxic tort claims

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ASTM Task Group Objectives

- **Address vapor intrusion arising from contaminated soil and groundwater specifically as it can impact *real estate transactions***
- **Clarify that vapor intrusion is a non-scope consideration in the ASTM E 1527 Phase I standard, but may be incorporated into the Phase I under a supplemental scope of work (aka asbestos, radon, lead-based paint, etc.)**
- **Develop prescriptive methodology to quickly an inexpensively screen out properties unlikely to have vapor intrusion issues**
- **Provide guidance on the overall vapor intrusion assessment process (from screening to mitigation)**

Outline of Standard

- Scope
- References
- Terminology
- Significance and Use
- Relationship to ASTM Phase I Standard
- User's Responsibilities
- Vapor Intrusion Assessment
- Report
- Non-scope Considerations
- Appendices

Appendices

- **Legal Background on Federal and State liability for Vapor Intrusion**
- **EP Qualifications and Relevant Experience**
- **Questionnaire (for prospective purchaser and property owner/operator/manager)**
- **Recommended Table of Contents and Report Format (for stand-alone VIA)**
- ***Federal and State Agency VI Web Resources***
- **Common Chemicals of Concern for VI Pathway**
- **Typical Background VOC Concentrations**
- ***Data Collection Guidance Documents for VIA***
- **Supplemental Bibliography**

New Terminology

Vapor Intrusion Condition (VIC) *is defined as "the presence or likely* ***presence of any chemicals of concern in the indoor air environment*** *of existing or planned structures on a property caused by the release of vapor from contaminated soil or groundwater on the property or within close proximity to the property, at a concentration that presents or may* ***present an unacceptable health risk*** *to occupants."*

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New Terminology Cont'd

- **Potential Vapor Intrusion Condition (pVIC)**
- **Pre-emptive mitigation**
- **Intrinsically safe building design**

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VIA Tiered Methodology

- Four tiers
- Designed to quickly and cost effectively screen out properties with a low risk of vapor intrusion
- Applies to volatile, select semi-volatiles and select volatile inorganic analyte (such as mercury) chemicals of concern

VIA Tiered Methodology cont'd

- First two tiers are designed to identify if a p-VIC exists – *the ASTM standard is prescriptive here*
- Third tier identifies a "toolbox" of approaches to assess whether a VIC exists – *the standard directs the user to follow appropriate and applicable government guidance documents*
- The fourth tier identifies general mitigation alternatives – *selection of a specific mitigation alternative is beyond the scope of the standard*
- From Tier 1, one can proceed to any of the other tiers, or directly to mitigation, or wherever client and EP choose

Tier 1 – Initial Screening for pVICs

- **Designed as a screening step to supplement a Phase I – relies on all the information already collected in Phase I investigation**

- **Two tests:**
  - **(1) Search Distance Test**
  - **(2) Chemicals of Concern (COC) Test**

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Tier 1 – Search Distance Test

Review of government and historical records (and whatever else learned in Phase I investigation) at specific search distances to identify contaminated properties within the Area of Concern (AOC)

- ***Primary AOC*** **– surrounding the TP**
  - **1/3 mile**
  - **1/10 mile (for petroleum)**
- ***Secondary AOC*** **– up-gradient of TP only**
  - **extending from primary AOC distances to full ASTM E 1527 search distances**

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EP Judgment

- ***Type target property*: residential of greater concern than office, hotel and retail of greater concern than industrial**
- ***Location of contamination source*: the closer the nearby contaminated source, the greater the concern**
  - **on the TP is worst case,**
  - **next worse case is an up-gradient source,**
  - **then cross-gradient,**
  - **then down-gradient**

EP Judgment cont'd

- ***Cleanup Status of Contaminated Site*: a remediated source is better than one that has not been remediated – although if there is "allowable" residual contamination, it is important for the remediation to have considered the vapor intrusion pathway**
- ***Depth to Groundwater*: the deeper the groundwater, the greater the distance soil vapors must travel and the lower their concentration at the surface**
- ***Soil Characteristics*: low permeability soil, such as silty-clayey soil suppresses soil vapor movement, as does soil with high moisture content**

EP Judgment cont'd

- **Presence of *"Vapor Conduits":* significant man-made conduits such as sewers and utility corridors and natural conduits such as fractured bedrock can accelerate vapor migration from a contamination source to a TP**
- **Presence of *Hydraulic or Physical Barriers*: between source of contamination and TP may eliminate any VI concern**
- ***Building Characteristics*: intrinsically safe building design may eliminate any VI concern**

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Tier 1 – COC Test

- Are COCs likely to be present?
- Refer to Appendix X6

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Tier 1 cont'd

- **Tier 1 is a quick and inexpensive first screen**
- ***If a pVIC does not exist*, vapor intrusion is presumed to be an unlikely concern at the target property**
- **If a *pVIC* exists, generally proceed to more refined screening (Tier 2), or may proceed directly to pre-emptive mitigation (Tier 4), or client and EP may choose to proceed in another direction**

Tier 2 – More Refined Screening

Non-invasive

- If Phase II data on contaminated source exists, the status of the contaminated plume is evaluated

Invasive

- If Phase II data on contaminated source does NOT exist, sampling can be conducted at TP or nearby, if possible, to identify if vapor migration and intrusion may be an issue

Tier 2 cont'd

- **Two tests as part of the non-invasive investigation:**

  (1) *Plume Test*
  (2) *RBC Test* (Comparison with Risk-Based Concentrations)

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Tier 2 – Plume Test

- **Assess whether or not the plume is close enough to an existing or planned structure on the TP to result in a pVIC**
- ***Critical Distance Determination***

Critical Distance Determination

- ***Critical distance* is…**

  - defined as *nearest edge of plume* to the *nearest structure* on the TP, or to the property boundary if there are no existing or planned structures
  - in *any direction* , e.g., horizontal, vertical, etc.
  - *100 ft for COC*
  - *30 ft for dissolved volatile petroleum hydrocarbons*
  - *100 ft for petroleum LNAPL* accumulating above the water table (“free product”)

Tier 2 – RBC Test

- Compare COC concentrations in plume with:
  - (a) generic RBCs in state where TP is located; or
  - (b) other government RBCs; or
  - (c) site-specific RBCs developed by EP, e.g., using ASTM's RBCA standard

Tier 2 – Invasive Screening

- If RBC exceeded, may want to do sampling to show pVIC is unlikely
- If no Phase II data is available, may want to do sampling to show pVIC unlikely
- Client may desire sampling
- Invasive testing may include soil, soil gas and/or groundwater sampling
- Sampling should only be conducted if able to provide useful information

If a pVIC exists…

- If a pVIC is created at the TP by a source of contamination, a REC is identified on the TP in the Phase I
- May proceed to Tier 3 for VIC confirmation, or
- May proceed to Tier 4 for pre-emptive mitigation, or
- Client and EP may choose another direction

In the screening process, what can "eliminate" a contaminated site from creating a pVIC at the TP?

- Outside AOC
- Hydraulic/Physical Barrier
- COCs unlikely to be present
- Beyond Critical Distance
- Below generic RBCs
- Below site-specific RBCs
- Sampling Data

Tier 3 – VIC Assessment

- Identify goals for the assessment
- Provide a "toolbox" of potential investigative processes, e.g.,
  - Soil gas (exterior/near-slab) sampling
  - Groundwater sampling
  - Sub-slab sampling/crawl space sampling
  - Indoor air sampling and ambient air sampling
  - Site-specific modeling for attenuation factors
- Standard directs user to existing applicable federal or state vapor intrusion policy or guidance
- Specific Scope of Services established by EP/client

Tier 4 - Mitigation

- Mitigation defined as:
  - "Necessary" (for a VIC)
  - "Pre-emptive" (for a pVIC)
- General mitigation alternatives identified with advantages/disadvantages
- Specific scope of services established by EP/client

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Closing Comments

- Action steps
- EDR's 2008 VI Training Series
- Poll Questions
- Q&A

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Action Steps

- Visit www.edrnet.com/vi for educational materials.
- Buy the ASTM standard.
- Take advantage of training resources:
  - Upcoming webinars
  - ASTM VI training
  - EDR's DDD forums
  - EDR's CommonGround community with a blog dedicated to vapor intrusion (April 2008 launch)
- Educate your clients
  - "VI fundamentals"

EDR's 2008 VI Training Series

- Upcoming webinars:
  - Repeat of today's on April 1st
  - "In the Trenches" detail on Tiers 1 and 2
  - Legal Perspective on VI
  - Real World Examples of VI Affecting Transactions
- Ideas for future webinar topics?
  - E-mail to:
  - dcrocker@edrnet.com

Q&A

For educational materials, training resources, and ASTM links for downloading the standard, visit www.edrnet.com/vi

More questions?
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