

## Review of VI Guidances

- EPA OSWER VI Guidance
- Summary of CA Guidances
- ITRC Guidance
- ASTM VI Standard

In this part of the training, we will briefly review the existing EPA draft guidance, some of the current States guidances, the ITRC guidance, and the just released ASTM standard. If you are a consultant or RP, you need to know which agency has jurisdiction and what their vapor intrusion policy is in order to know what approaches are allowed and what the acceptable levels are.

# EPA-OSWER Draft Guidance

- Tier 1: **Primary** Screening
  - Q1: VOCs present?
  - Q2: Near buildings?
  - Q3: Immediate concern?
  
- Tier 2: **Secondary** Screening
  - Q4: Generic screening
  - Q5: Semi-site specific screening (alphas from charts & tables)
  
- Tier 3: **Site-Specific Pathway** Assessment
  - Q6: Indoor air (and/or subslab)

The current EPA draft VI guidance consists of 3 tiers, consisting of 6 questions. Tier 1 is essentially a screening survey asking basic questions such as whether volatile compound contamination exists and whether buildings exist.

Tier 2 consists of 2 questions/steps: Q4 & Q5. Question 4 is so restrictive (i.e., very low fail levels) that just about every site fails, similar to a vortex or hopper. Question 5 allows more sampling options, is not as conservative, and may be the best tier/question to work within.

Tier 3, question 6, allows for only two investigatory methods, indoor air or sub-slab soil gas, and has very restrictive (i.e., very low fail levels) criteria. Once at this level, it is extremely hard to get out and requires expensive and repeated sampling. It is much like being in jail.

# Newest Changes (2008)

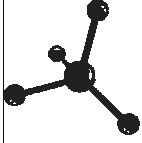
## EPA OSWER VI Guidance

- Tier 1: **Primary** Screening
  - Q1: VOCs present?
  - Q2: Near buildings?
  - Q3: Immediate concern?
  
- Tier 2: Source Screening
  - Generic screening using near-source samples
  
- Tier 3: Pathway (Building) Assessment
  - Multiple lines of evidence (sg & gw)
  - Must go inside???

The changes currently being considered by the EPA would make the vapor intrusion pathway even more stringent. Few sites would screen out and indoor sampling (sub-slab or indoor air) is required in most cases.

<b>DRAFT Exterior Decision Matrix</b>		<b>Concentration in Groundwater</b>		
		Well above level of concern	Around level of concern	Well below level of concern
<b>Concentration in Soil Gas</b>	Well above level of concern	Interior sampling or mitigation	Possible vadose source; Interior sampling or mitigation	Possible vadose source; Interior sampling or mitigation
	Around level of concern	Interior sampling or mitigation	Interior sampling or mitigation	Possible vadose source; Interior sampling or mitigation
	Well below level of concern	Consider geologic setting <sup>1</sup> , verification sampling in select locations	Consider geologic setting <sup>1</sup> , verification sampling in select locations	NFA unless nearby property has unacceptable risks (verification, monitoring)
<sup>1</sup> Review subsurface stratigraphy, depth to water, to determine presence, integrity, effectiveness of geologic barriers to vapor migration.				

This matrix was one idea drafted by EPA for vapor intrusion assessment using only exterior data. As you can see, the “categories” are very subjective and there is only one box that does not require any further action in this matrix. If you play this “vapor intrusion bingo”, you lose on 8 out of 9 of the squares. Fortunately, this is only a draft concept. The EPA is holding a workshop in March 2008 to discuss these types of issues.



# CA Guidances

- **CA-DTSC (& LA-RWQCB)**
  - Soil Gas Collection & Analysis Advisory
  - Vapor Intrusion “Guidance”
  - CHHSLs (thanks to OEHHA)
- **EPA Region 9**
  - Follows the EPA Draft VI Guidance
  - TCE value & Sub-slab alpha different
- **SF-RWQCB**
  - Has own screening values (ESLs)
- **Central Valley Boards**
  - Want Residential Criteria Regardless of Site Use



Here is a summary of the vapor intrusion policy/guidances for some California regulatory agencies. DTSC has soil gas collection & analytical guidance and a vapor intrusion guidance document which are being updated in 2008. Region 9 typically follows OSWER and uses the lower TCE value & different sub-slab attenuation factor. The San Francisco Water Board has issued their own ESLs (fail levels). The Central Valley & some Bay Area agencies are requiring residential criteria at all sites, whether current use is commercial or residential, to avoid hassles of deed restrictions and future monitoring of property use.

## DTSC Step-Wise Approach

- Steps 1-4: Is Site VI Candidate?
  - Got Buildings? (If not now, in future?)
  - Got COCs?
  - Got Headaches?
- Step 5: Generic Risk: Alphas or CHHSLs
- Steps 6 & 7: Site Specific Risk Using J-E
  - Soil Gas Data Preferred. Near & Sub-slab.
- Steps 8-10: Indoor Air Sampling
- Step 11: Mitigate

A brief summary of the DTSC guidance goes like this:

Steps 1 through 4 evaluate whether vapor intrusion is a possible concern at a given site. Because the criteria are so conservative, these steps are more like a hopper than a filter, so nearly all sites are “in”.

Step 5 allows you to compare measured values to acceptable levels using DTSC determined alpha factors or tabulated CHHSLs. You must also use the maximum concentration found on the site.

Steps 6 & 7 allow use of the DTSC version of the J-E model to determine whether you pass or fail. You may use an average of the measured data and you have some freedom to change some of the default model parameters. Soil gas data are the preferred type.

Steps 8 through 10 are for indoor air sampling programs and Step 11 describes mitigation.

# Beware The CHHSLs

## How do the CHHSLs differ from cleanup standards?

**The CHHSLs presented in the lookup tables are NOT regulatory "cleanup standards".** Use of the CHHSLs and this document is voluntary on the part of those who choose to use them. At sites where cleanup of contaminated soils to levels at or below the CHHSLs would be costly, the time and effort to develop more site-specific cleanup may be desired. At sites where the extent of contaminated soil is limited or the timeframe available to carry out cleanup actions is very short, use of the CHHSLs as final soil cleanup standards may be cost-beneficial. However, this would require the concurrence of both the responsible party and the overseeing regulatory agency and can only be done after a full evaluation of site conditions and other potential environmental concerns. Regulatory agencies cannot be compelled to use the CHHSLs as final cleanup standards for a contaminated property.

The California Human Health Screening Levels (CHHSLs) illustrate the confusion in the vapor intrusion world and how consultants and regulators misapply them. This text, extracted from the document itself, clearly states that they are NOT regulatory cleanup standards and they are to be used voluntarily unless BOTH parties concur to use them. However most CA regulators are insisting they be met and most consultants are acquiescing to their demands to the detriment of their clients

## Summary of State VI Guidance

- Written:
  - NY, NH, MA, CT, PA, SC, LA, CO, OR, ID, NJ, IN, MI, CA, MN, DL, WI
- Working on a Draft:
  - FL, AZ, WA, TN
- Pondering:
  - ITRC survey implies at least 40 states

Many States have developed or are developing their own VI guidance because they don't agree with EPA's or they find it too confusing. Some States currently have written guidance, others have drafts, and others are pondering. Some States are still trying to figure it all out and have asked for training on the subject.

## ITRC VI Guidance

- Practical How-to Guide
- Stepwise Approach
- Discussion of Investigatory Tools
- Thorough Discussion of Mitigation
- Scenarios Document
- Classroom Training in 2008

ITRC finished it's vapor intrusion guidance document in early 2007. Internet training was given in 2007 and classroom training is starting in 2008.

# ITRC VI Scenario Document

- Gas station in residential neighborhood
- Dry-cleaner in strip mall located adjacent to neighborhood
- Large industrial facility with long plume under several hundred buildings
- Vacant lot with proposed Brownfields development over groundwater plume
- Vacant large commercial building with warehouse space and office space
- Apartment building with parking garage over groundwater plume



Technical and Regulatory Guidance  
Supplement

**Vapor Intrusion Pathway:  
Investigative Approaches for Typical Scenarios**  
*A Supplement to Vapor Intrusion Pathway: A Practical Guide*



January 2007

Prepared by  
The American Petroleum & Regulatory Council  
Vapor Intrusion Team

The ITRC scenarios document gives a recommended step-by-step approach for a variety of site scenarios, including 2 with petroleum hydrocarbons.

# Regulatory Approach for HC Sites

- Range of Regulatory Approaches:
  - USEPA: 2002 Guidance not recommended for UST sites
  - ASTM: Critical distance reduced from 100' to 30'
  - Some regulatory agencies include a 10X biodegradation factor
  - ITRC: Use vertical profile to demonstrate
- These approaches are overly conservative for most petroleum release sites

Presently, most vapor intrusion guidances ignore bioattenuation. For those that discuss or consider it, there is a range of approaches to account for it. Some States simply decrease the distance of concern. Some give a 10 times allowance (typically by increasing screening levels) for bioattenuation. There is general recognition that these regulatory approaches tend to be overly conservative

## ASTM VI Standard

- Focus on Property Transactions
- Longer Screening Distances
- No RBSLs – Use Local Standards
- No Sampling Info – Refers to ITRC
- Legal Standards
- Extensive Mitigation Treatment
- Released on March 3, 2008

ASTM just completed a standard for vapor intrusion as it applies to property transactions. The standard was released on March 3, 2008. Because it uses larger screening distances, it will increase the number of sites that need to have a vapor intrusion assessment.

## ASTM VI Standard

*Vapor Intrusion Condition (VIC)* is defined as “the presence or likely presence of any volatile chemical of concern in existing or planned structures on a property resulting from an existing release or a past release from contaminated soil or groundwater on the property or within close proximity to the property, at a concentration that presents or may present a human health risk.”

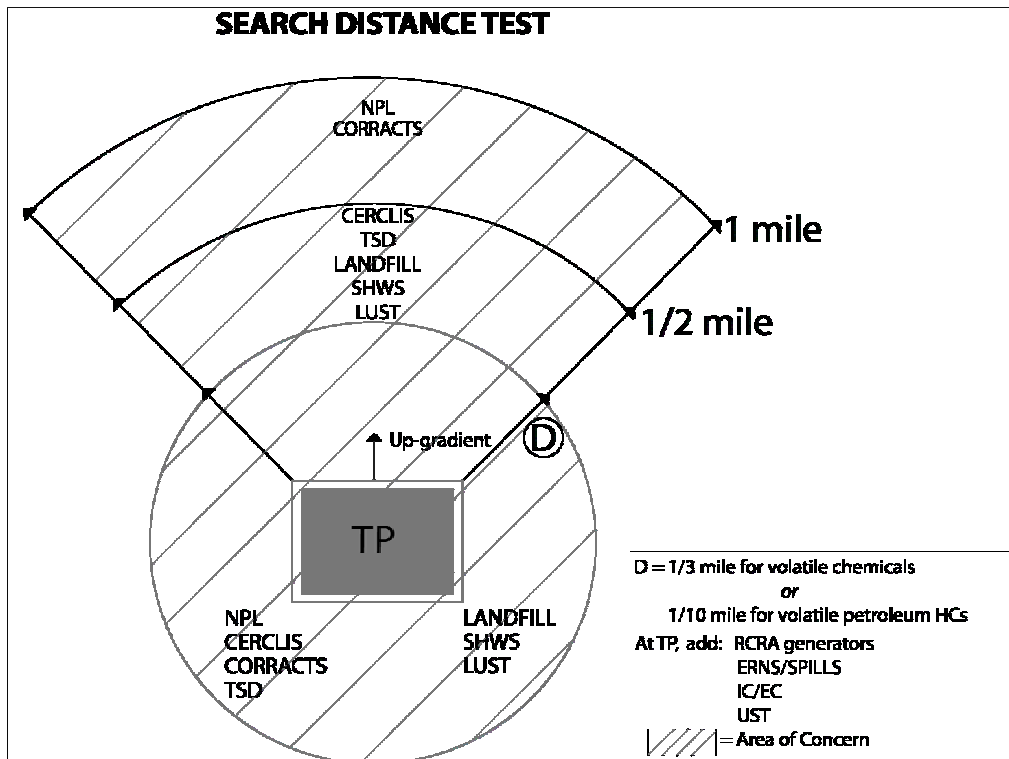
The Standard defines a new term/acronym: the Vapor Intrusion Condition.

## ASTM VI Standard

- Tiers 1: Screening (Phase 1)
- Tier 2: Non-invasive Screening (p-VIC)
- Tier 3: Investigation – no details
- Tier 4: Mitigation

Can Jump to Tier 4 at Any time

The ASTM standard consists of 4 tiers. Tier 1 & 2 are analagous to Tier 1 in the ASTM Phase 1 standard.



The Standard identifies the following search distances. Note the long distances for the initial (Tier 1) search.

Slide courtesy of Anthony Buonicore, Chairman ASTM VI Task Group

## Liability Concerns

- Phase I Environmental Consultant
- Prospective/Current Property Owner
- Property Lender
- Property Insurer

Liability concerns is a big part of vapor intrusion. Those at risk include consultants, property owners (past, current & future), lenders, and insurance companies.

Slide courtesy of Anthony Buonicore, Chairman ASTM VI Task Group