Vapor Intrusion Guidance Update

NEWMOA Vapor Intrusion Workshop
September 26 & 27, 2013
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Vermont Vapor Intrusion Guidance

- First Indoor Air Guidance for Petroleum written in 1989; included background as standard
- Guidance Memos on Cl solvents began in mid-2000
- VI first formally addressed for all COCs in April 2012 IROCP
- IROCP not a “how to” but includes background to VI and screening table
- VI Section most detailed part of IROCP (Appendix C: Vapor Intrusion) due to all other media covered by other State Programs

Vermont Vapor Intrusion Guidance

- VI Screening Values Table, which includes:
  - Target Indoor Air Value for approx. 90 COCs
  - Back calculates GW concentration triggers
  - Shallow Soil Gas ≤ 5 ft; alpha =0.1
  - Deep Soil Gas < 5 ft; alpha =0.01
- Some COCs reported at background from VDH Background IA Study or can use VT Haz Ambient Air Levels
- BTEX alpha at 0.001 & 0.0001 for shallow & deep soils
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Indoor Air Screening Levels
- Risk
  - All risk at 10E-6 (unless IA or Ambient outdoor air higher)
  - Exposure duration calculated at 70 years
- VI Investigations Iterative; GW, Soil Vapor, Sub Slab, Indoor Air

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VI Evaluations Follow 1 of 2 Processes
Petroleum Sites (or other biodegradable COCs)
- TPH w/i 5’ structure, use VI Screening Values Table
- TPH soils >100mg/kg or PID >10 ppm
  &/or GW above VI Screening Value, or
- TPH soils >5’ from structure, use UT empirical data studies
  - TPH Soils 5-10’ use TPH >100 mg/kg or PID >10 ppm
    &/or GW exceeds 1000 ug/l benzene or 10,000 TPH, or
- NAPL on water table within 30’ of structure, or
- NAPL in soils adjacent to structure foundation
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VI Evaluations Follow 1 of 2 Processes

Chlorinated Solvent Sites

- VI Investigation required if CIHC in soil, GW, or soil gas within 100’ of structure above VI Screening Values
- If work required, then a SI Work Plan must be submitted and approved
- VI Soil Gas Sampling
  - SGS-Min. 2 points acap to structure, 2-5’ below structure
  - Sub Slab-Directly below slab, number of points site specific
  - Ambient Outdoor-Upwind of structure
  - Indoor Air-Basement & living space (compare & household chemicals)

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TCE Update

- Short Term Health Effects
  - Fetal cardiac malformation (FCM) during first trimester
- Chronic Health Effects
  - Cancer (Liver, kidney, non-Hodgkin’s lymphoma)
  - Non-Cancer (Thymus effect)
- VT DOH working on new VI Screening Value
  - Talk now about some average between FCM and chronic value
### VI Screening Values Table (Example Set)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Target Indoor Air Screening Levels</th>
<th>GW Concentration (ug/l)</th>
<th>Shallow Soil Gas &lt;5 ft (ug/m³) alpha 0.1</th>
<th>Deep Soil Gas &gt;5 ft (ug/m³) alpha 0.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1-Dichloroethane</td>
<td>50</td>
<td>218</td>
<td>500</td>
<td>5000</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>2.1</td>
<td>5.8</td>
<td>21</td>
<td>210</td>
</tr>
<tr>
<td>Ethylene dibromide</td>
<td>0.0045</td>
<td>Nsv</td>
<td>0.045</td>
<td>0.45</td>
</tr>
<tr>
<td>TCE</td>
<td>0.5</td>
<td>1.19</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Benzene*</td>
<td>1.18</td>
<td>5.2</td>
<td>1180(0.001)</td>
<td>11800(0.0001)</td>
</tr>
</tbody>
</table>

Questions?
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