Addressing Potential TCE Exposures at Closed Sites

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Basic Regulatory Questions for Suspected Chemical Releases

- Are the releases rare?... Common?
- Are the quantities released small?... Large?
- Are the chemicals of low toxicity?... High?
- Are the compounds easily biodegraded?... Are they persistent?
- Are the chemicals insoluble and/or non-volatile?... Are they mobile?

How Concerned Should We Be About Potential Exposures?
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Small, rare releases of relatively non-toxic, immobile biodegradable material that we fully understand

Less Concern

More Concern

Large, common releases of mysterious, persistent toxic chemicals that migrate quickly in the environment

Change in USEPA Toxicity Information

*Considered carcinogenic to humans but most sensitive endpoint is non-cancer health effects:*

- 2011 EPA released new “Reference Concentration” (RfC) of 2 µg/m³
- 2 µg/m³ is safe for short- and long-term exposure
- RfC considers developmental effects (fetal cardiac malformations) that may occur *after only a few days exposure* during early pregnancy
TCE as an Emerging Contaminant

Change in toxicity information results in a change in level of concern

At what point above 2 μg/m³ is TCE exposure a concern for pregnant women?

- MassDEP raised the issue with its Health Effects Advisory Committee
- Short-term levels of concern identified for
  - Women who may be in their first 8 weeks of pregnancy;
  - General population;
  - Residential settings; and
  - Workplace settings
Combination of VI & TCE

1. Relatively low levels of TCE in soil or groundwater can result in low-but-significant contamination in indoor air

2. Limited options for effective short-term actions to reduce exposure potential

3. Sites closed under OLD cleanup standards may still have levels of concern in soil or groundwater

4. MGL c21E requires MassDEP to insure that all Imminent Hazards are addressed
### Changes in Toxicity => Changes in Levels of Concern

for TCE In Indoor Air and Groundwater for POTENTIAL Imminent Hazards

<table>
<thead>
<tr>
<th>(Residential)</th>
<th>Pre-2011</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Air</td>
<td>85 µg/m³</td>
<td>6 µg/m³</td>
</tr>
<tr>
<td>Groundwater</td>
<td>300 µg/L pre-2006</td>
<td>5 µg/L</td>
</tr>
<tr>
<td></td>
<td>50 µg/L post-2006</td>
<td></td>
</tr>
<tr>
<td>Health Effect</td>
<td>Long-term</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td>Cancer Risk</td>
<td>Developmental Effect</td>
</tr>
</tbody>
</table>

**Imminent Hazard Values for All Receptors**

<table>
<thead>
<tr>
<th>Residential Exposure Scenario</th>
<th>Indoor Air Concentration</th>
<th>Concern Level</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immune system effects</td>
<td>&gt; 20 µg/m³</td>
<td>Imminent Hazard</td>
<td>Immediate Response Action initiated on an expedited time table</td>
</tr>
<tr>
<td>(Subchronic Exposure Nocancer Risk, HQ=10)</td>
<td></td>
<td>2-hr Notification</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Workplace Exposure Scenario</th>
<th>Indoor Air Concentration</th>
<th>Concern Level</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immune system effects</td>
<td>&gt; 80 µg/m³</td>
<td>Imminent Hazard</td>
<td>Immediate Response Action initiated on an expedited time table</td>
</tr>
<tr>
<td>(Subchronic Exposure Nocancer Risk, HQ=10)</td>
<td></td>
<td>2-hr Notification</td>
<td></td>
</tr>
</tbody>
</table>
Scope of the Potential Problem

• ~ 1,000(+-) potential sites for initial screen
  Based on a database search for “TCE”, “trichloroethylene”, “chlorinated solvents”, etc. NOT DEFINITIVE

• ~ 200 (+/-) identified for follow-up
  concentration of TCE in groundwater, proximity to receptors, etc

• ~25% (+/-) of follow-up results in addition response actions “worst sites” prioritized

MassDEP Review of Conditions at TCE Sites
Closed Under Old Standards

• MassDEP contact current owners

• MassDEP can/will conduct initial sampling to determine if current conditions require further assessment or response actions

• Primary concern is identifying any potential for exposure and mitigating that exposure, NOT enforcement
It is Not Just “Closed” Sites:

- Downgradient Property Status
- Financial Inability
- Temporary Solutions
- Permanent Solutions (RAOs) in past
- Partial Permanent Solutions (RAO-P)
- Adequately Regulated Sites
- Active (in process) Sites
- Self-Motivated Re-Notifications
- BRAND NEW Sites

MassDEP TCE Information Online

http://www.mass.gov/eea/agencies/massdep/cleanup/regulations/site-cleanup-policies-guidance.html#4

- A Fact Sheet, “TCE Toxicity Information: Implications for Chronic and Shorter-Term Exposure” targeted to the regulated community;

- Two sets of “Frequently Asked Questions”, for residential and workplace exposures, to address concerns raised by individuals who live and work in buildings affected by the TCE contamination;

- Documentation of MassDEP’s review of the USEPA’s toxicity values for TCE and the Department’s advisory committee recommendations for addressing short-term exposure; and

- technical guidance: “Vapor Intrusion Guidance: Site Assessment, Mitigation and Closure”