

Vapor Intrusion from a State Perspective

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Issues

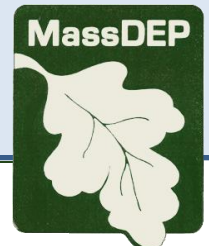
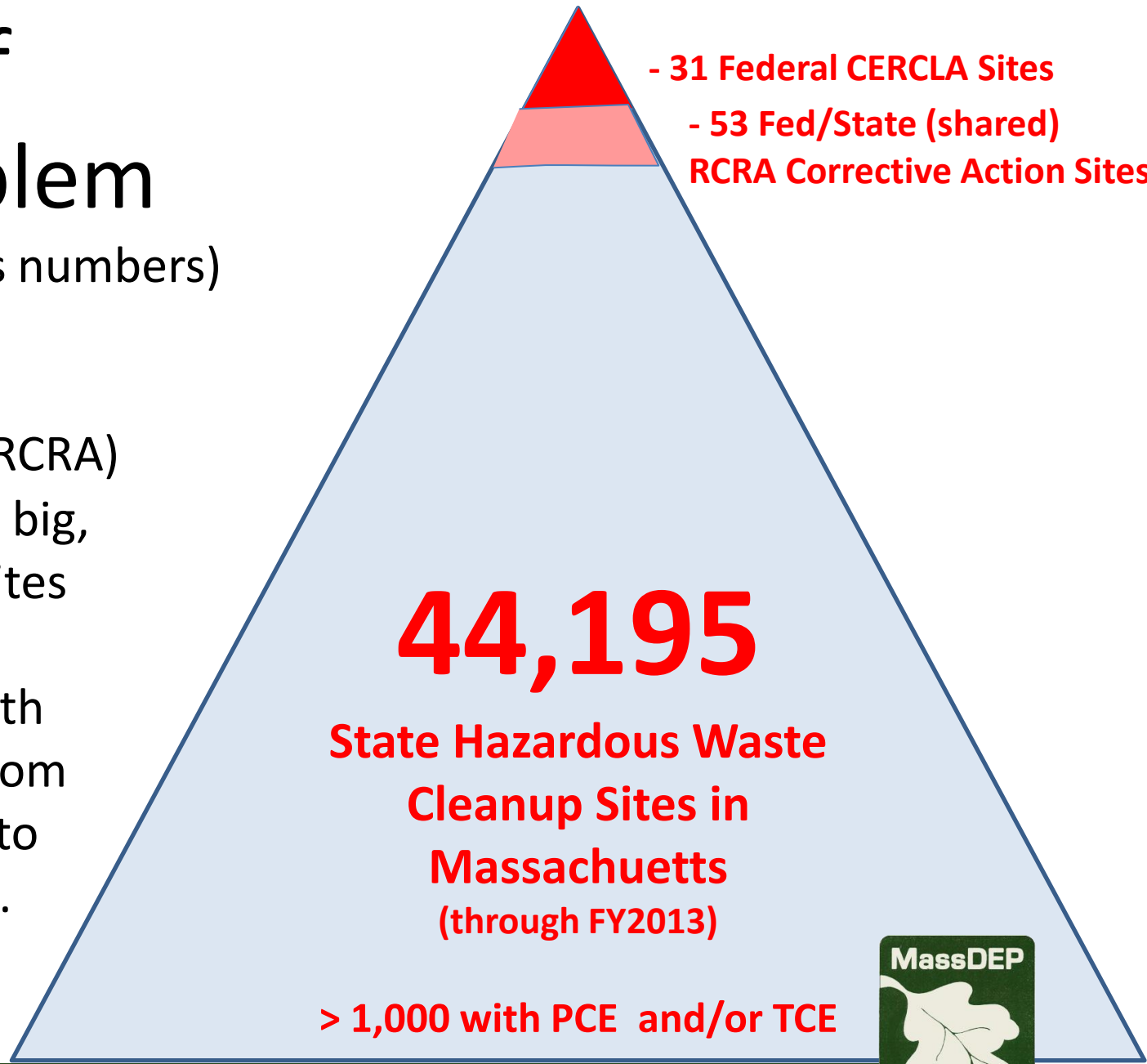
- Many potential Vapor Intrusion sites
- Huge site-specific variability
- Low concentrations of concern
- Contaminants difficult to remediate
- Long-term



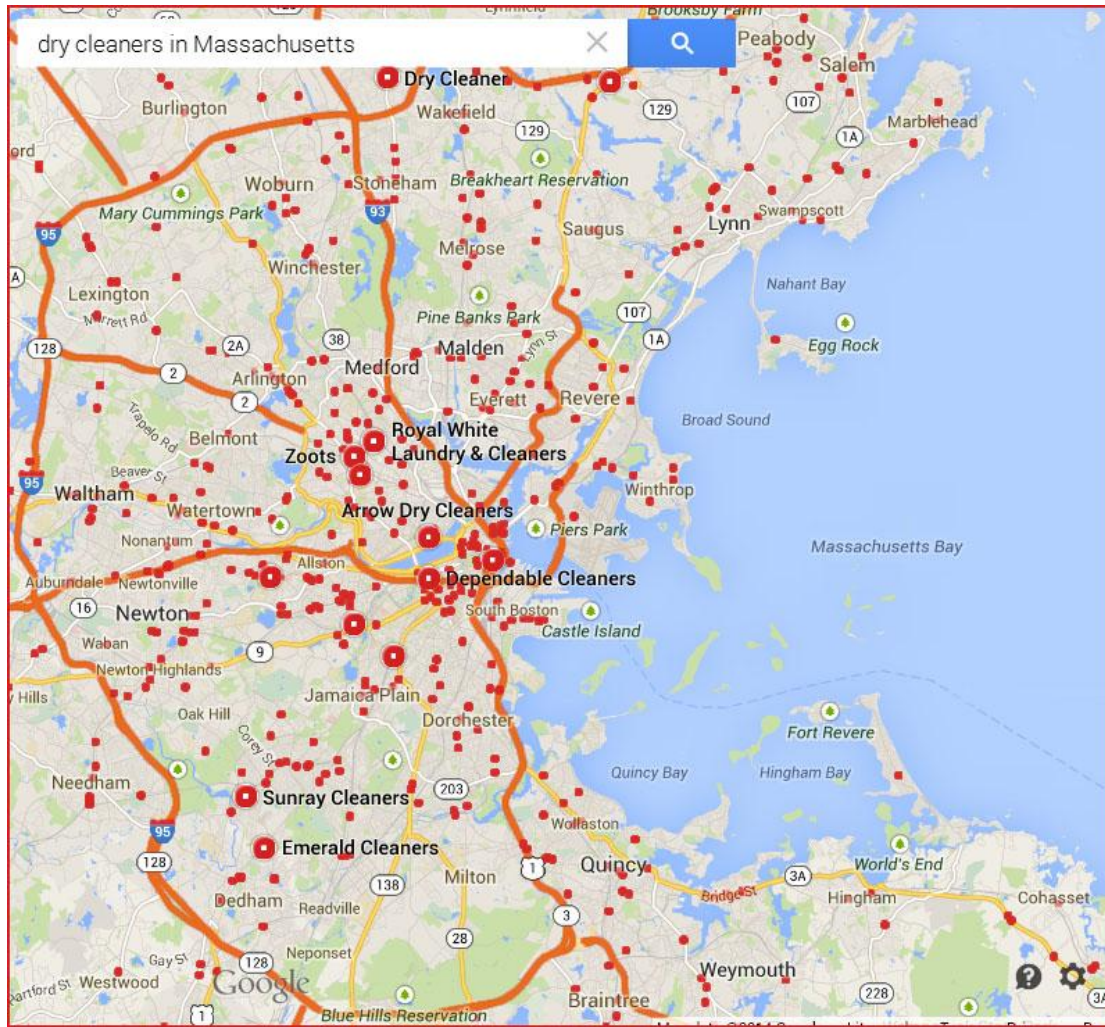
Scope of the Problem

(Massachusetts numbers)

- EPA (CERCLA/RCRA) deals with the big, complicated sites
- States deal with everything: from simple/small to big/complex... and MORE of them.



Scope of the Problem #2: Just Google “Dry Cleaners in [fill in city name]”



- Dry Cleaners tend to be located in densely populated neighborhoods
- PCE plumes from historic management practices affect nearby buildings
- TCE sources more diverse, as use as degreasing solvent in industry/manufacturing



Cause for Concern

PCE (cancer risk)

- USEPA Unit Risk value: $3 \times 10^{-7} (\mu\text{g}/\text{m}^3)^{-1}$
- 1-in-1 million risk level: $0.8 \mu\text{g}/\text{m}^3$
- Indoor air background: $1.4 - 4.1 \mu\text{g}/\text{m}^3$ (50th – 95th %tiles)

TCE (noncancer risk)

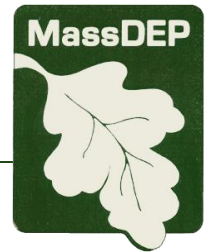
- USEPA Reference Concentration: $2 \mu\text{g}/\text{m}^3$
- RfC based on short-term exposure & developmental effects
- Sensitive Receptor = woman in 1st trimester of pregnancy
- Short-term action often required
- Hazard Quotient = 1 level: $2 \mu\text{g}/\text{m}^3$
- Indoor air background:

$0.68 - 0.8 \mu\text{g}/\text{m}^3$ (50th – 95th %tiles)



Regulatory Approaches

- IDENTIFY suspect sites/locations
- ELIMINATE or CONTROL ongoing sources
- ENCOURAGE active sub-slab depressurization systems
- FLAG vacant land/future buildings over plumes
- IMPLEMENT Institutional Controls



A Tale of Two Sites

North of Boston



South of Boston

Vacant, Formerly Light
Manufacturing & Warehouses



Vacant, Formerly
Jewelry Manufacturing

Known to have “residual” contamination
including metals, PAHs & PCE



Known to have “residual” contamination
including metals, PAHs & solvents

Located in hot
residential market



Located in hot
residential market

Experienced developer proposes
multi-building rental development



Experienced developer proposes
multi-building rental development

SITE A

SITE B



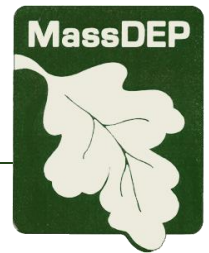
What Happened?

SITE A

- Additional soil (source) removal , Plume delineation
- Construction included subsurface garages open to air to interrupt vapor intrusion pathway

SITE B

- Some soil removal, some re-grading, some groundwater samples...
- Some knowledge, less understanding
- Construction actually trapped soil gas, created a vapor intrusion pathway
- Construction makes retrofit difficult/expensive



More MassDEP VI information

- Paul W. Locke, MassDEP Bureau of Waste Site Cleanup
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- **Massachusetts Waste Site Cleanup Rules**
<http://www.mass.gov/eea/agencies/massdep/cleanup/regulations/site-cleanup-regulations-and-standards.html>
- **Indoor Air Guidance Project Blog**
<http://indoorairproject.wordpress.com/>
- **Vapor Intrusion Guidance**
<http://www.mass.gov/eea/docs/dep/cleanup/laws/vifin.pdf>
- **Indoor Air Sampling and Evaluation Guide**
<http://www.mass.gov/eea/docs/dep/cleanup/laws/02-430.pdf>
- **Guidelines for the Design, Installation, and Operation of Sub-Slab Depressurization Systems:**
<http://www.mass.gov/eea/docs/dep/cleanup/laws/ssd1e.pdf>
- **Technical Update: Residential Typical Indoor Air Concentrations**
<http://www.mass.gov/eea/docs/dep/cleanup/laws/iatu.pdf>

