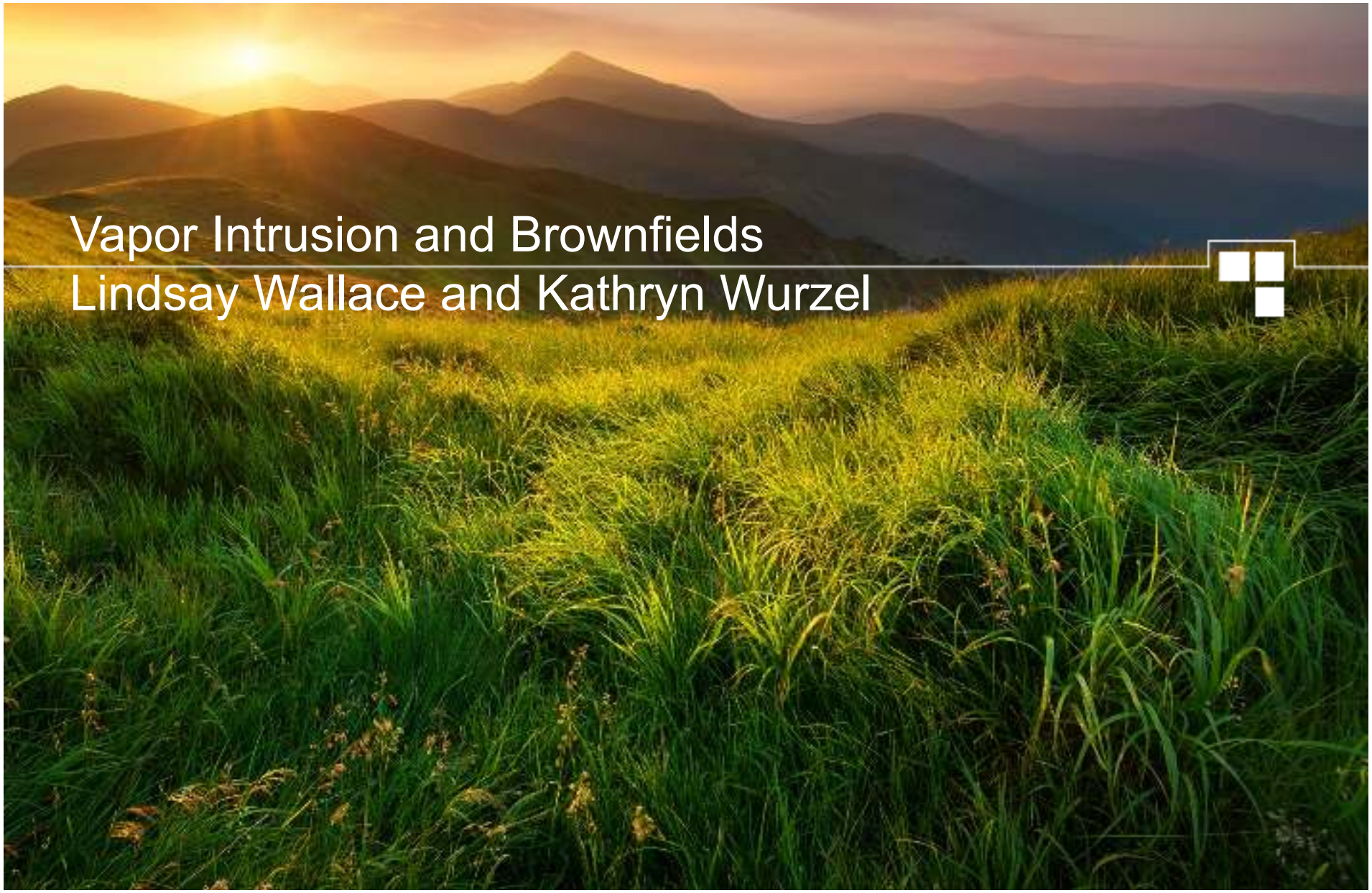


Vapor Intrusion and Brownfields

Lindsay Wallace and Kathryn Wurzel

Perspective // Vision // Solution

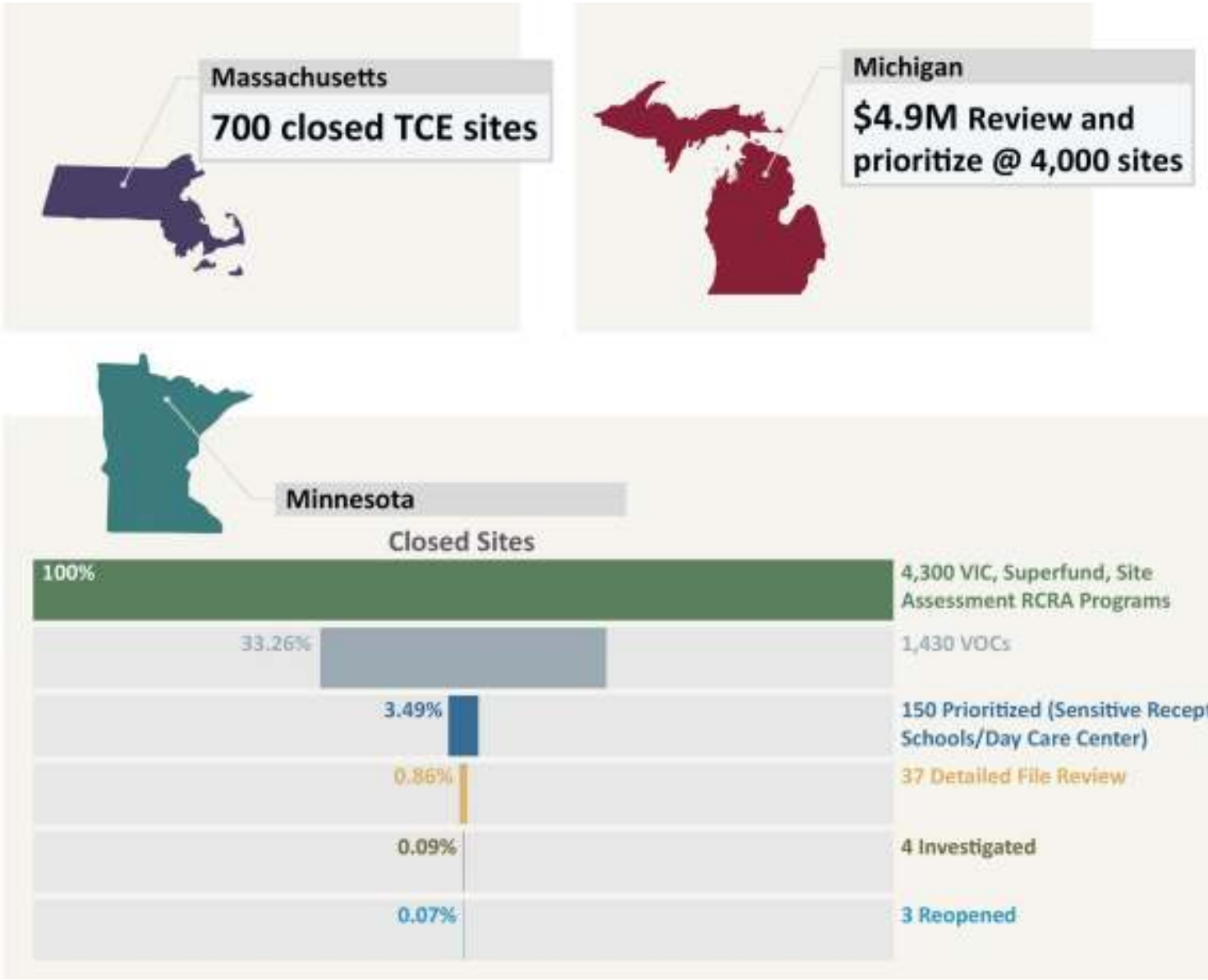
NewFields

History of Vapor Intrusion

HRS – NPL Listing

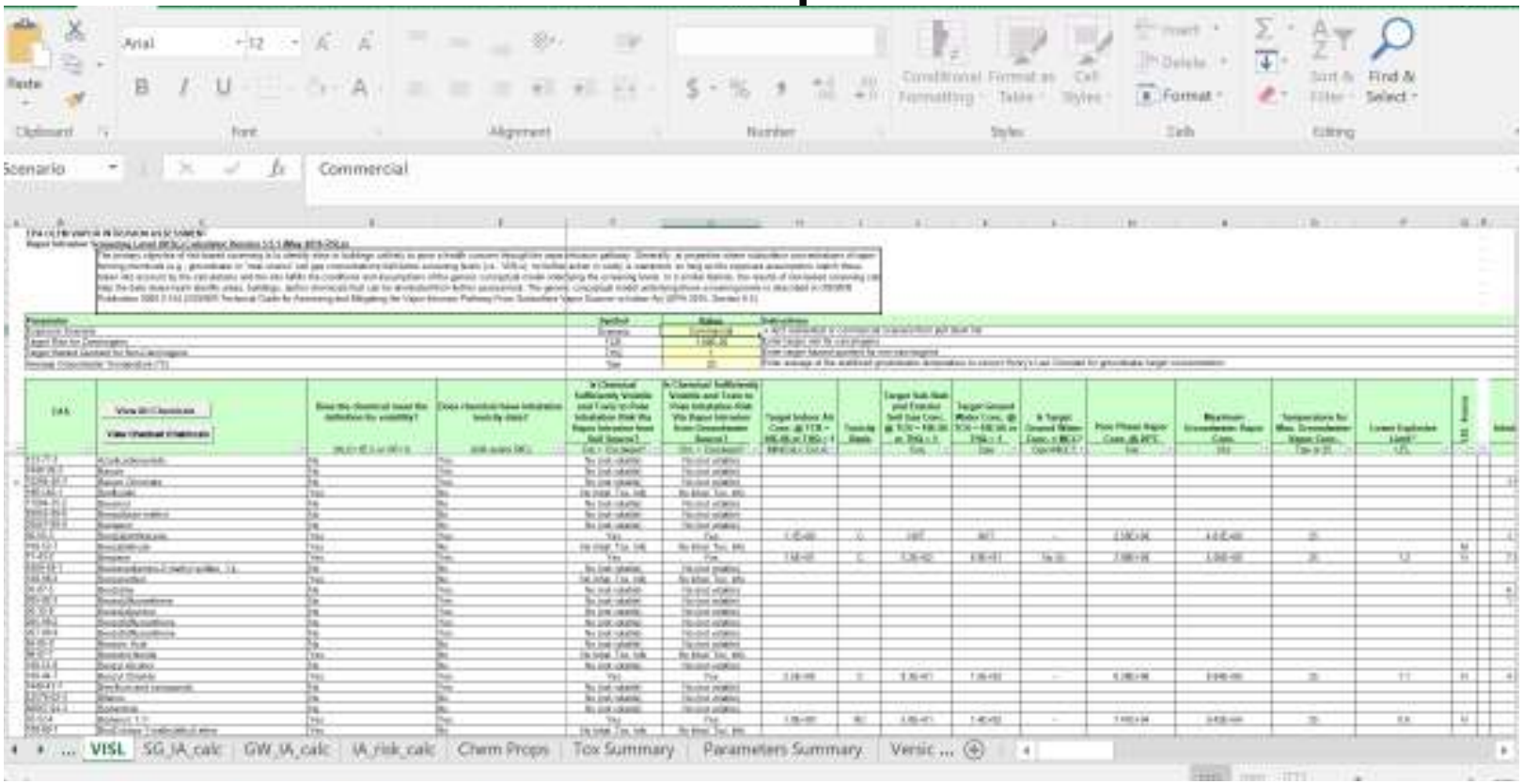
- Subsurface intrusion
  - Water in basements/crawlspaces
  - Vapor intrusion
- Scoring new sites for inclusion on the NPL
- NPL sites will not be reopened
  - Five Year Reviews

State Activities

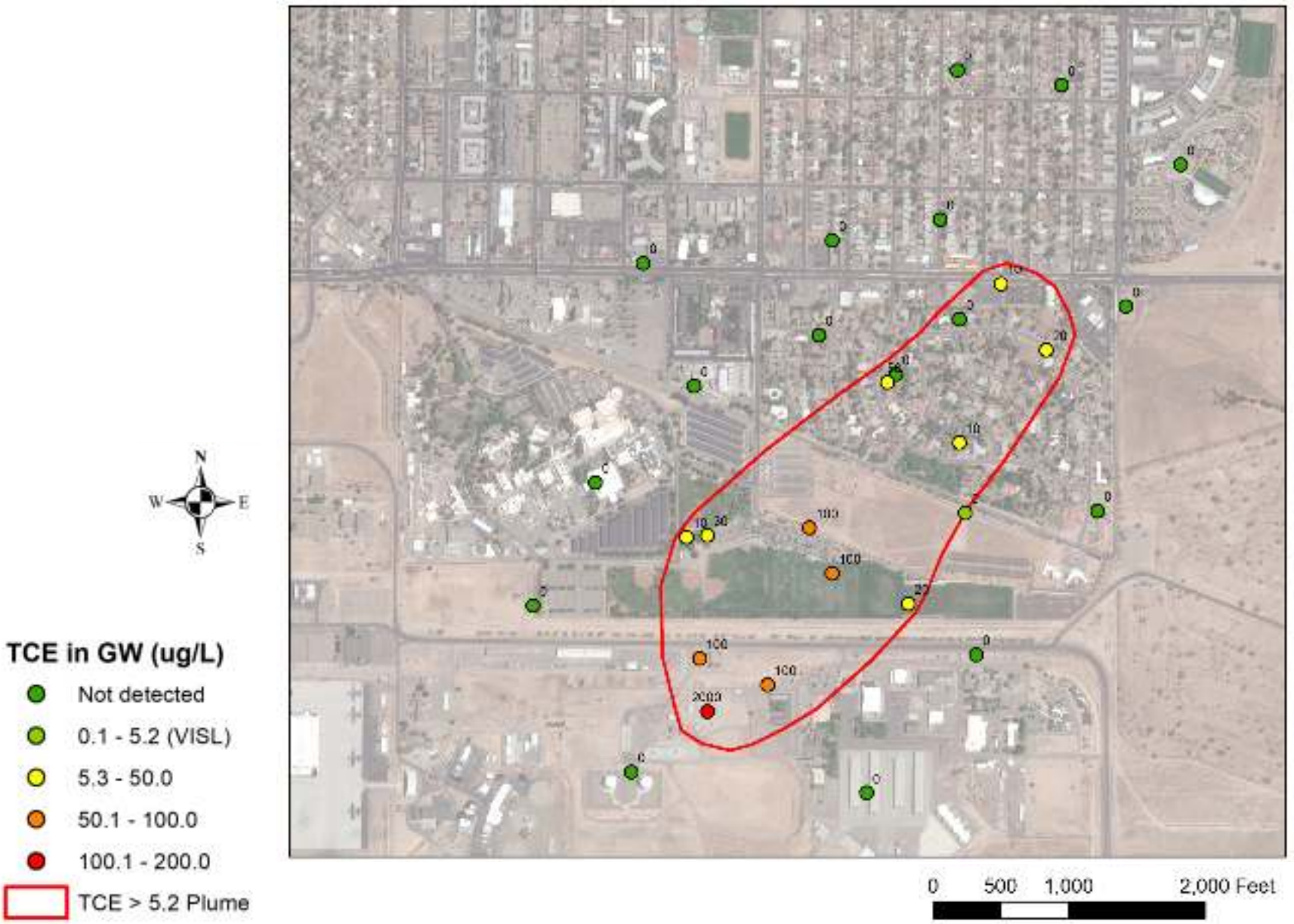


VOC Groundwater Plume

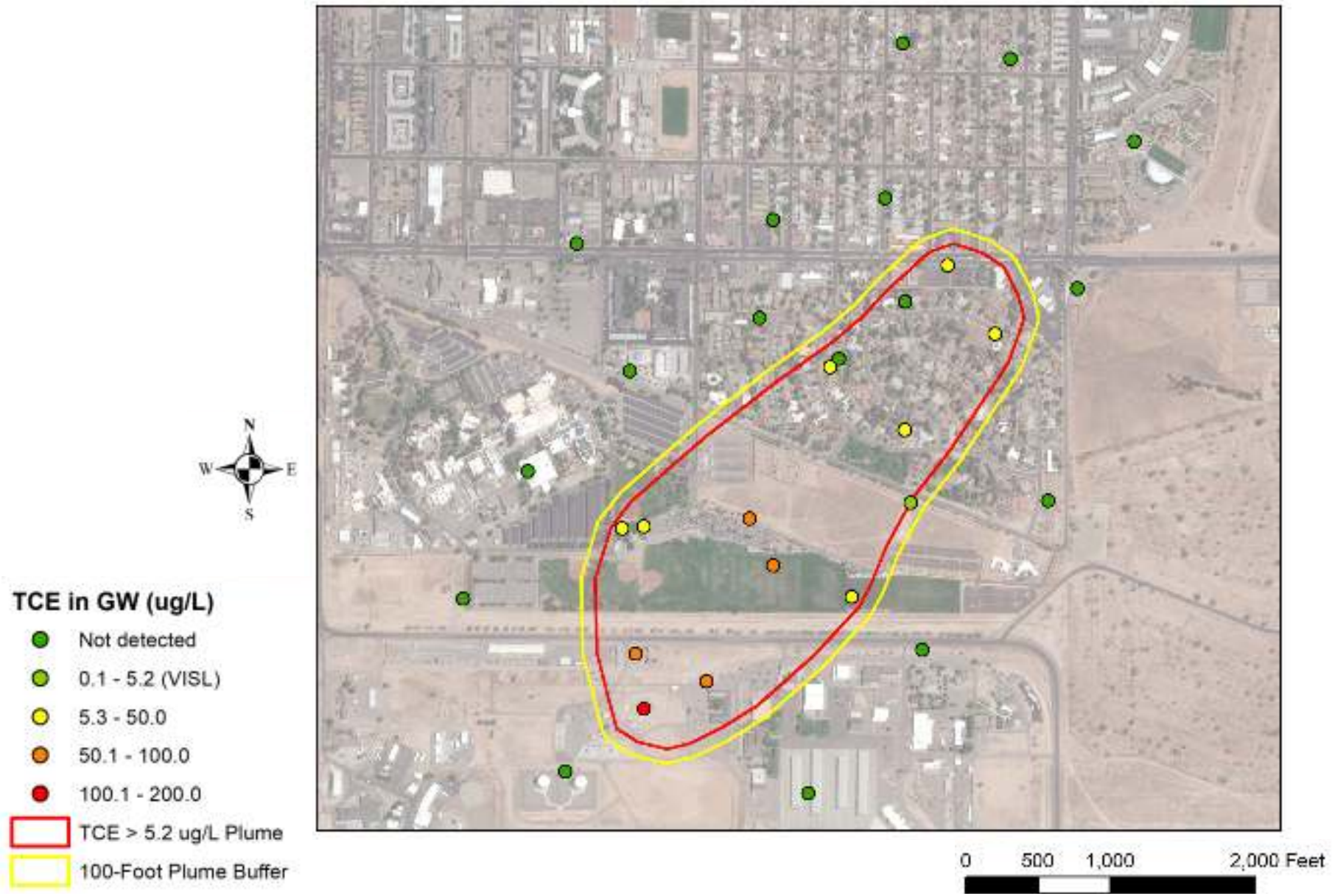
The presence of a VOC groundwater plume above vapor intrusion standards requires further evaluation for vapor intrusion risk.



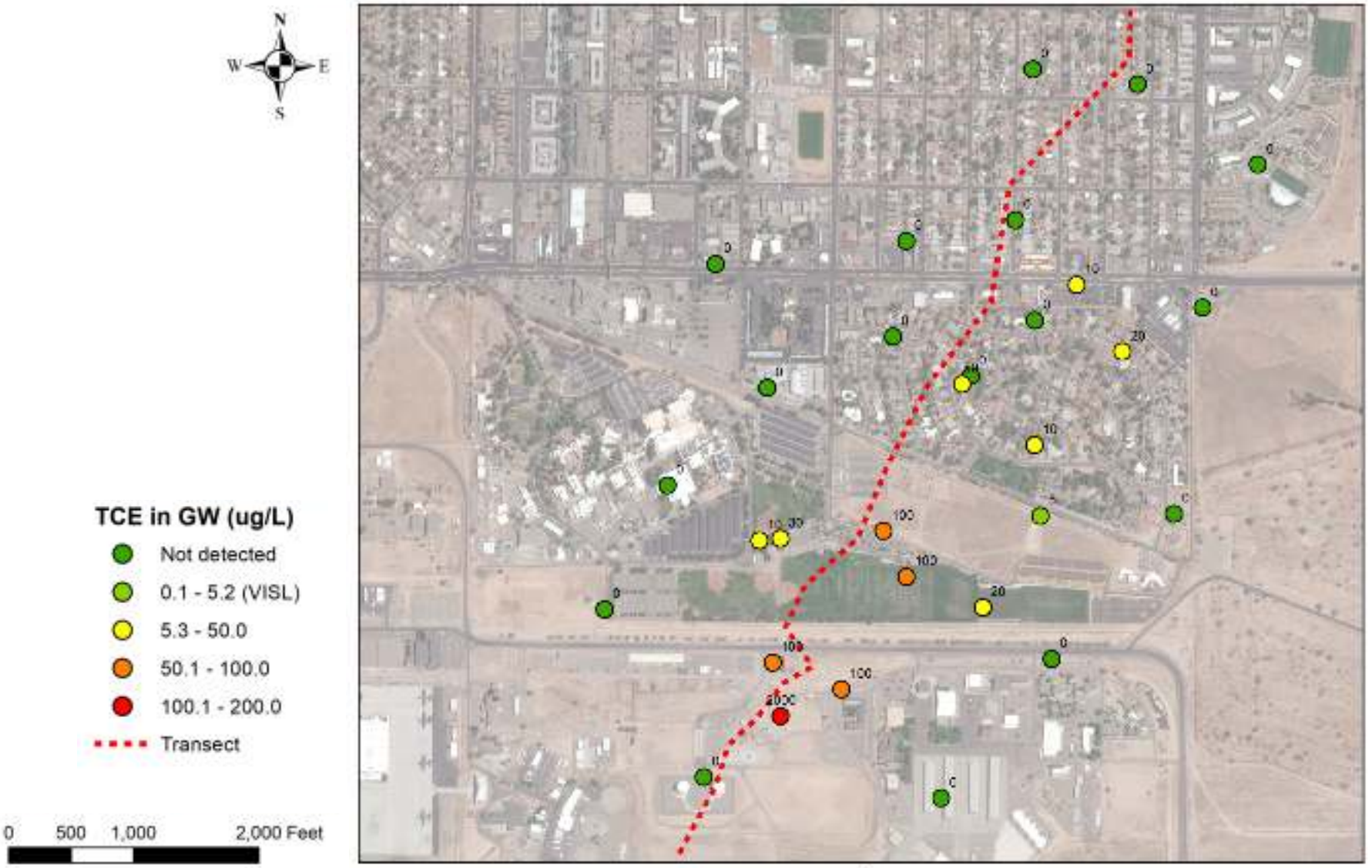
Groundwater Plume Delineation



Groundwater Plume Delineation

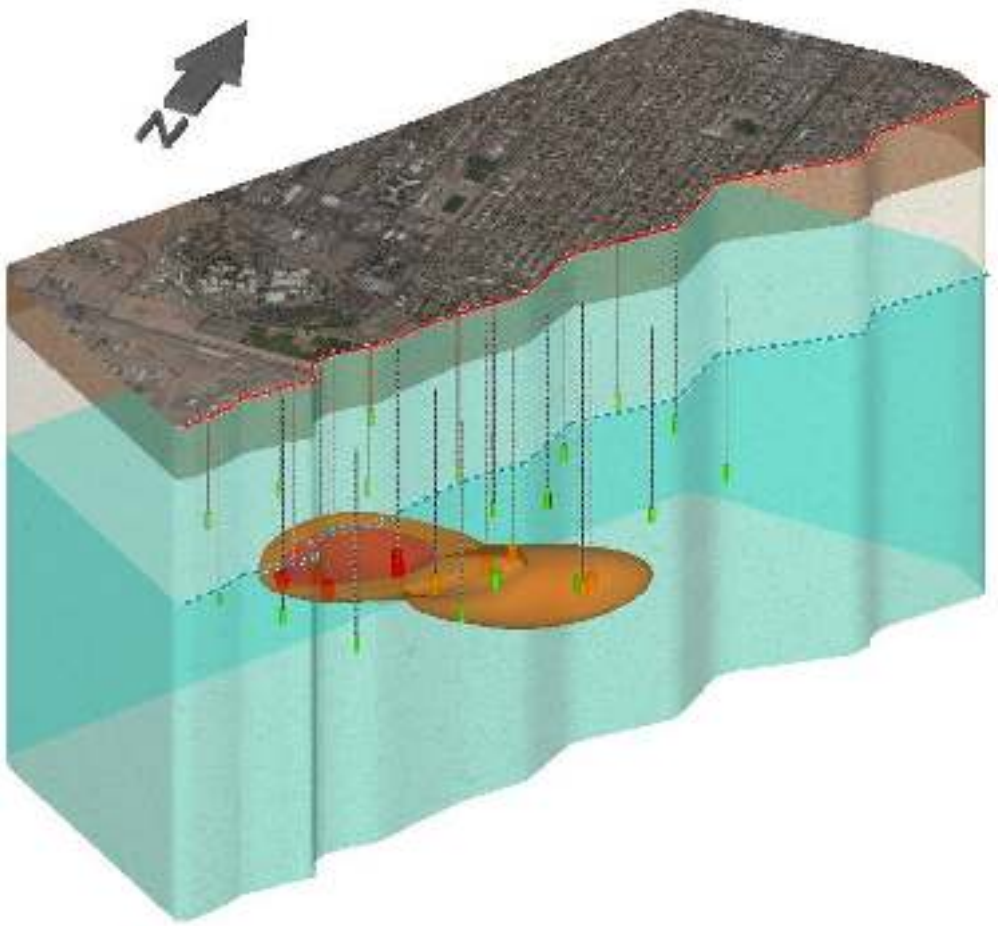


3-D or Cross-sectional View

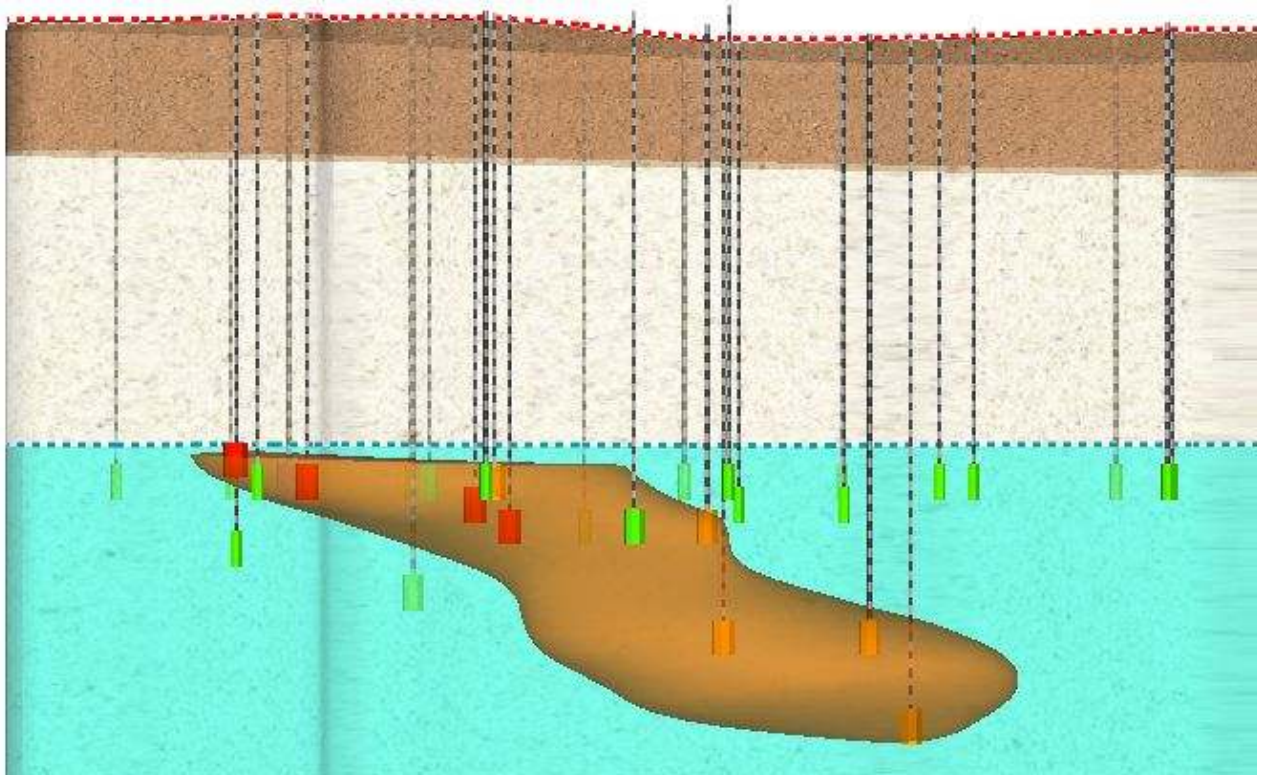


3-D or Cross-sectional View

3-D or Cross-sectional View



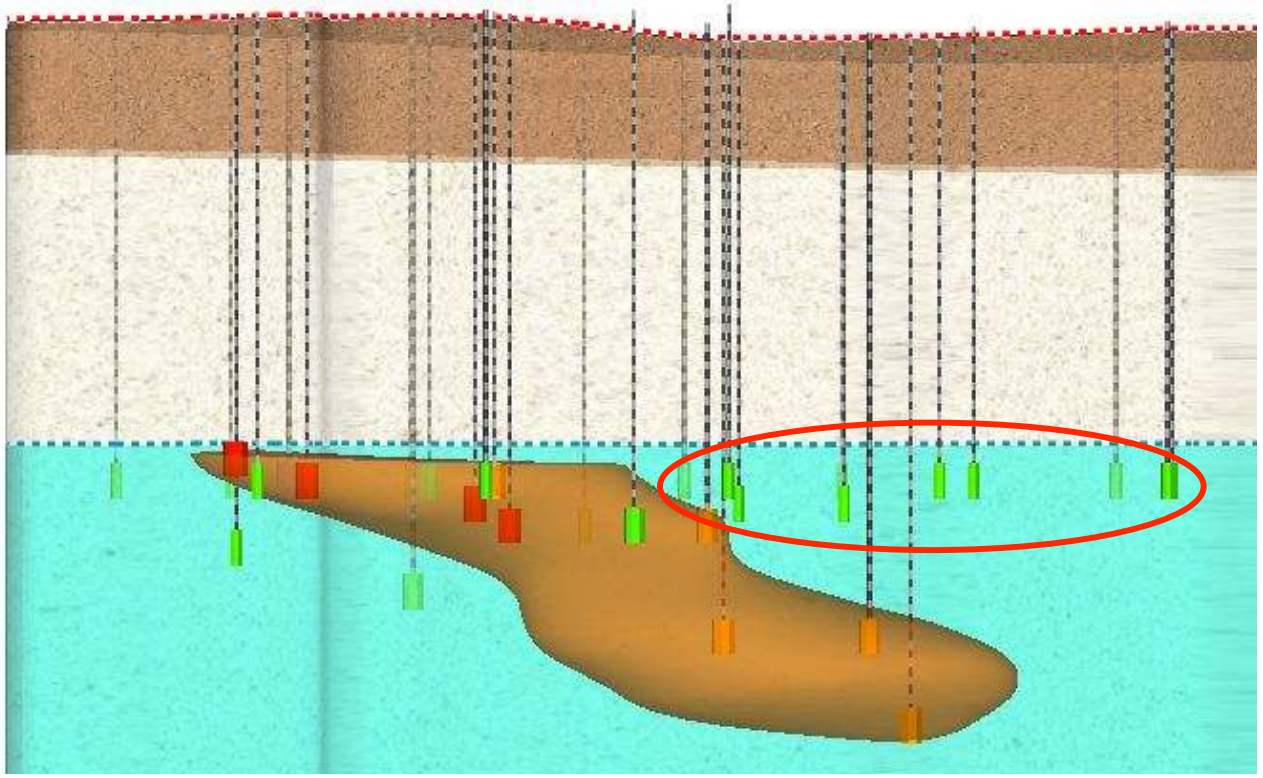
3-D or Cross-sectional View



Groundwater at the Water Table

"When groundwater is a subsurface source of vapors, collect groundwater samples from wells screened across the top of the water table to characterize the source strength for vapor intrusion."

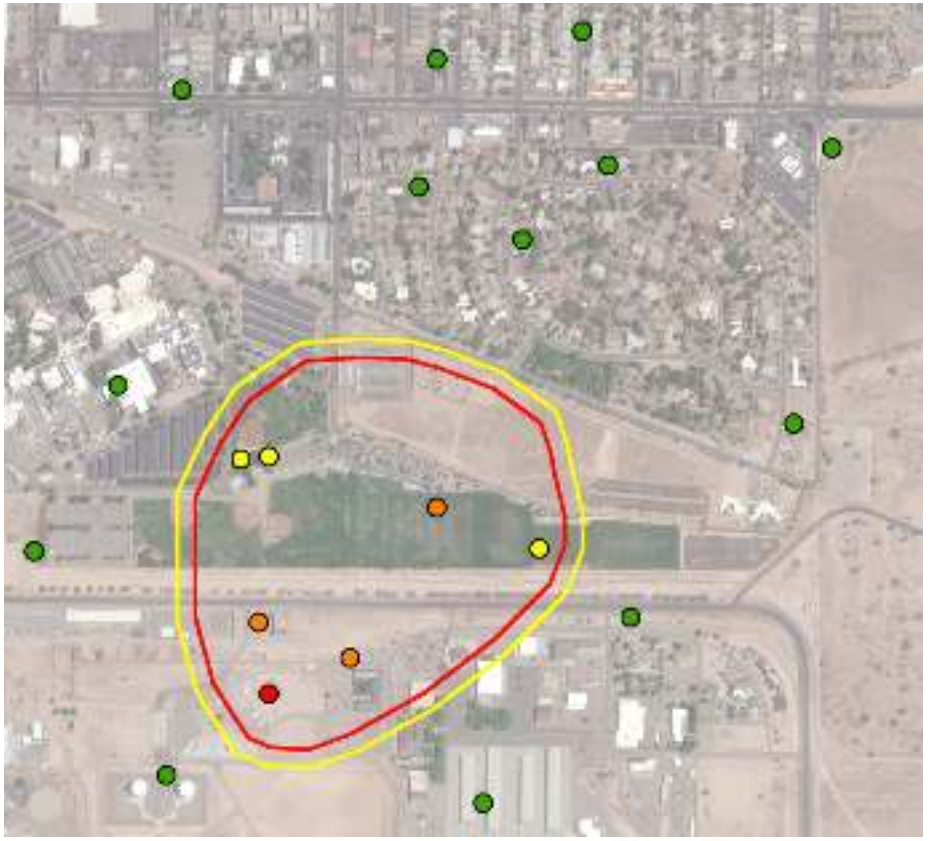
Source: EPA's June 2015 OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air.



Groundwater at the Water Table

All TCE in groundwater

TCE at or near the water table



TCE in GW (ug/L)

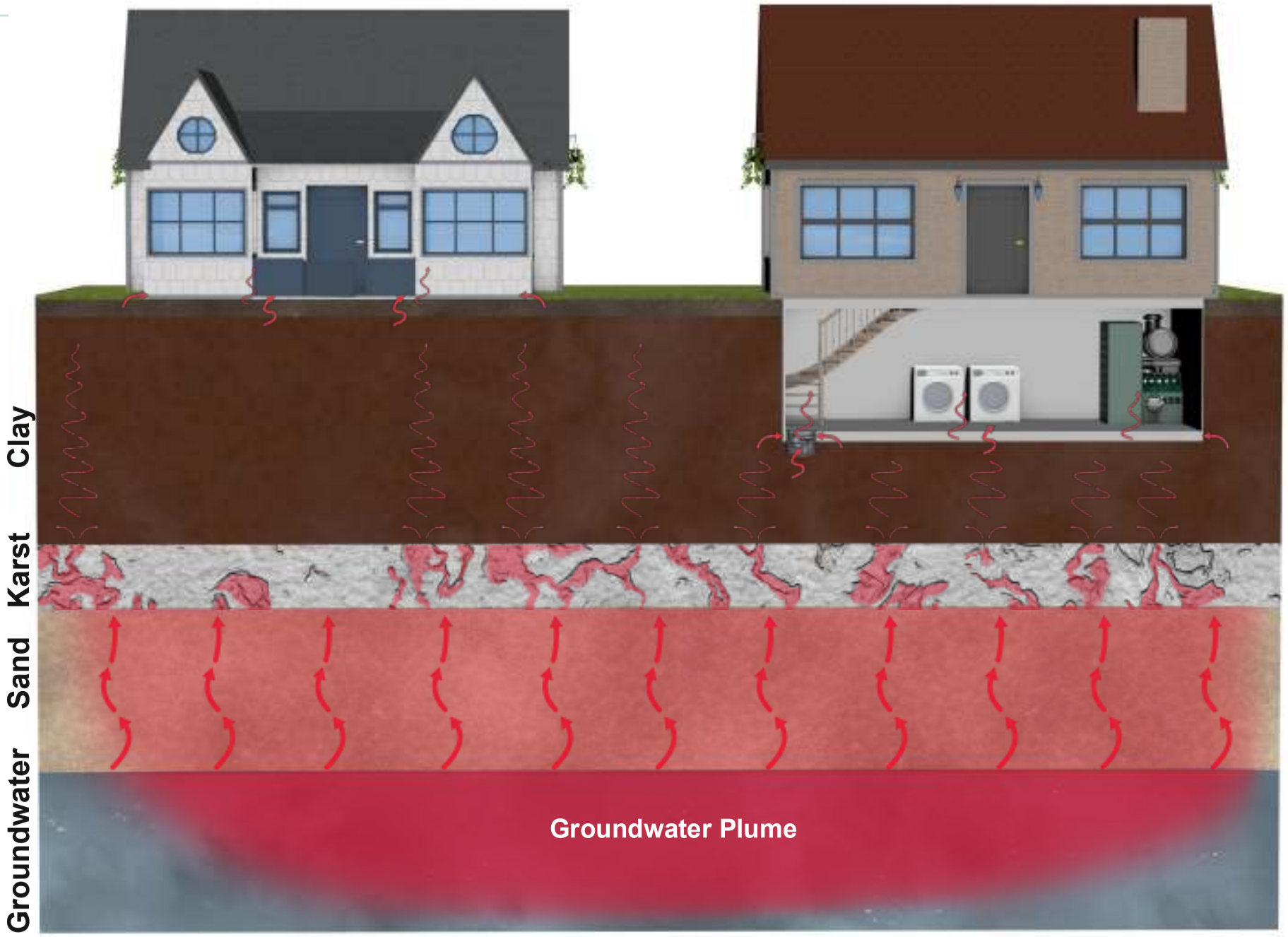
- Not detected
- 0.1 - 5.2 (VISL)
- 5.3 - 50.0
- 50.1 - 100.0
- 100.1 - 200.0

TCE > 5.2 ug/L Plume

100-Foot Plume Buffer

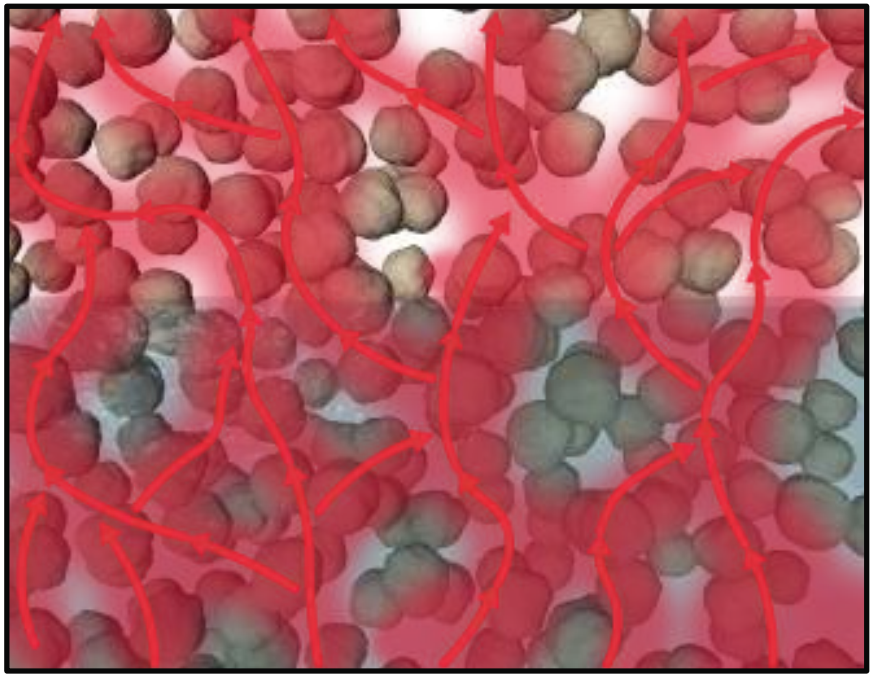
0 500 1,000 2,000 Feet

Home

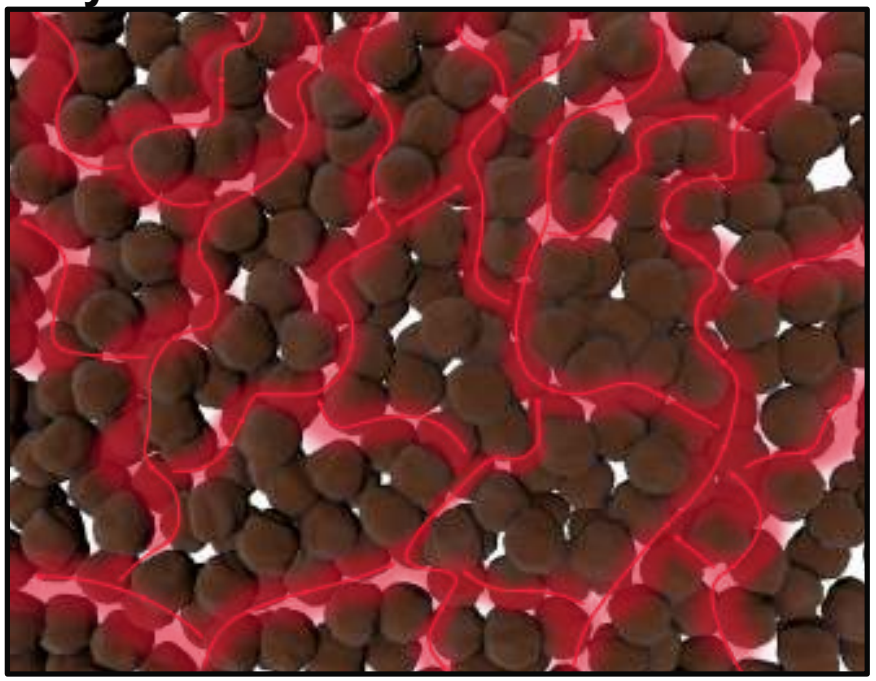


Home

Sand:



Clay:



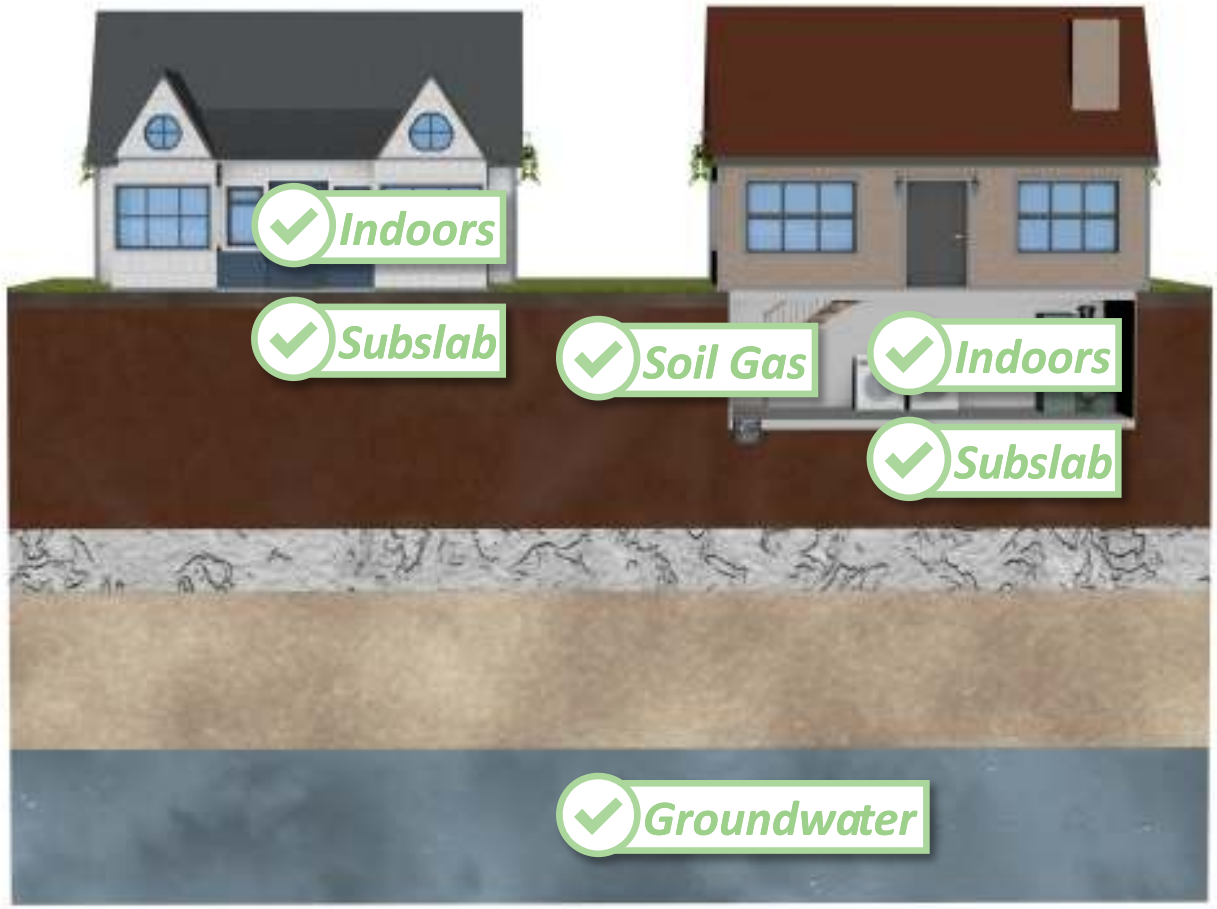
Sampling Hierarchy

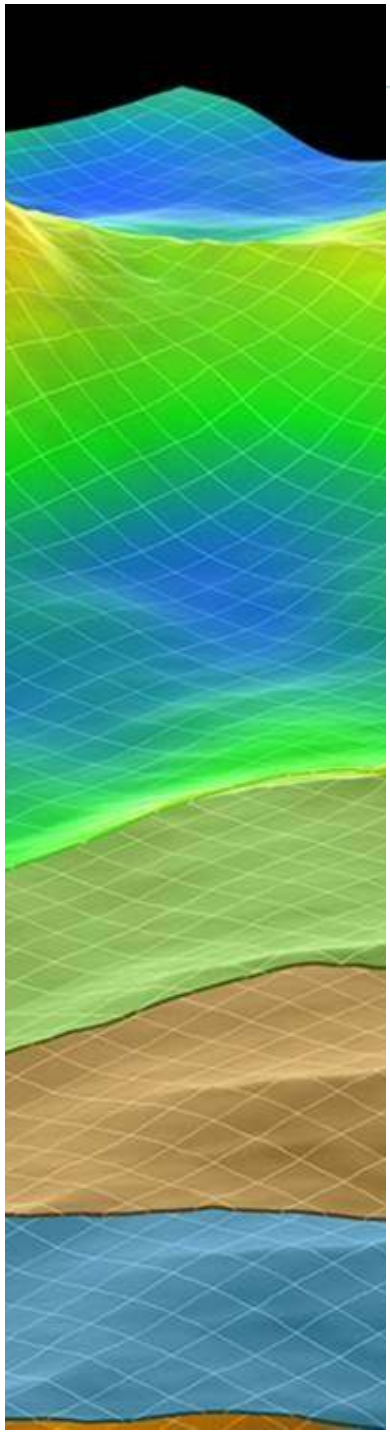
1) Groundwater

2) Soil Gas

3) Subslab

4) Indoors

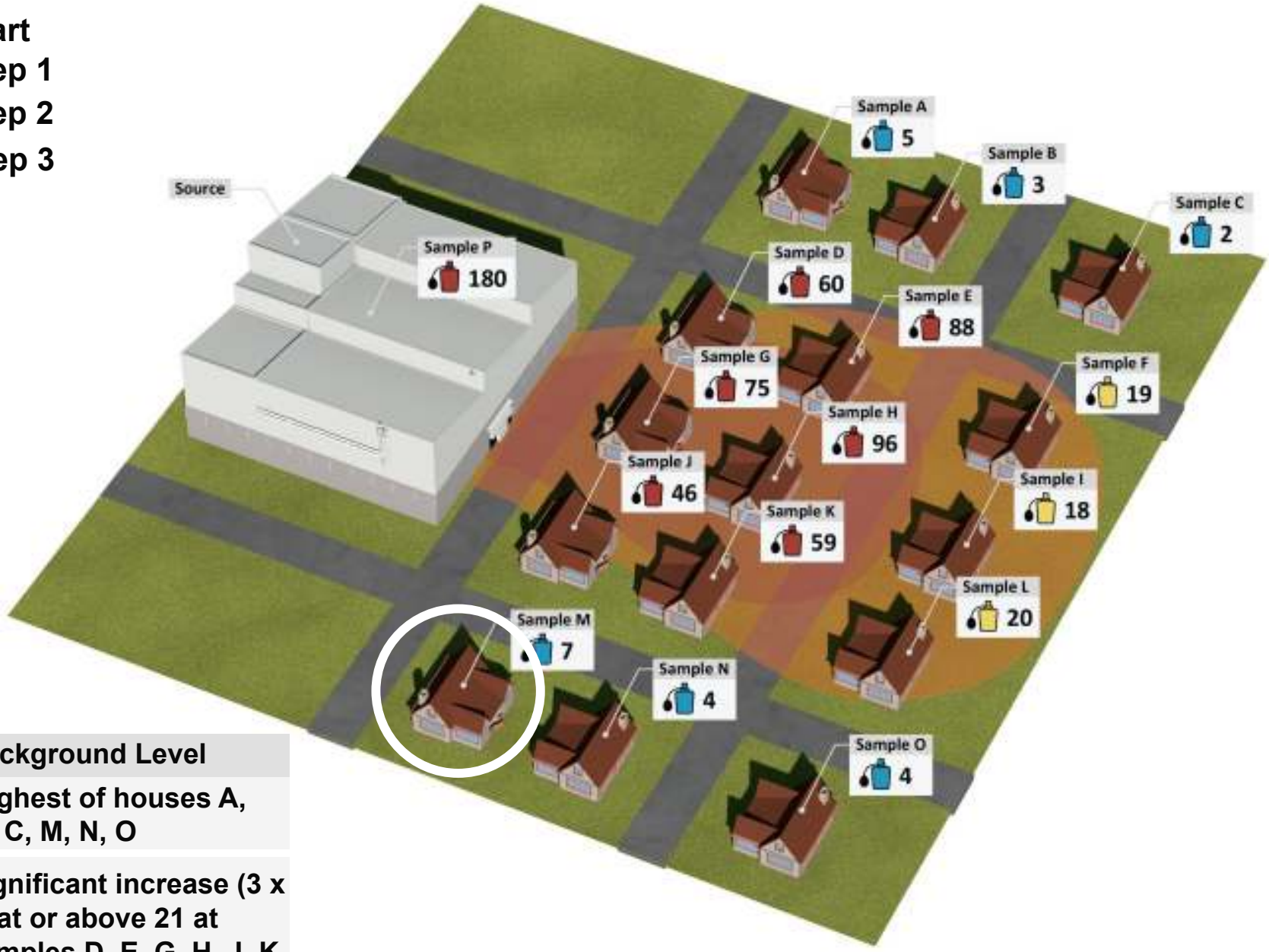




Indoor Air Background Concentrations

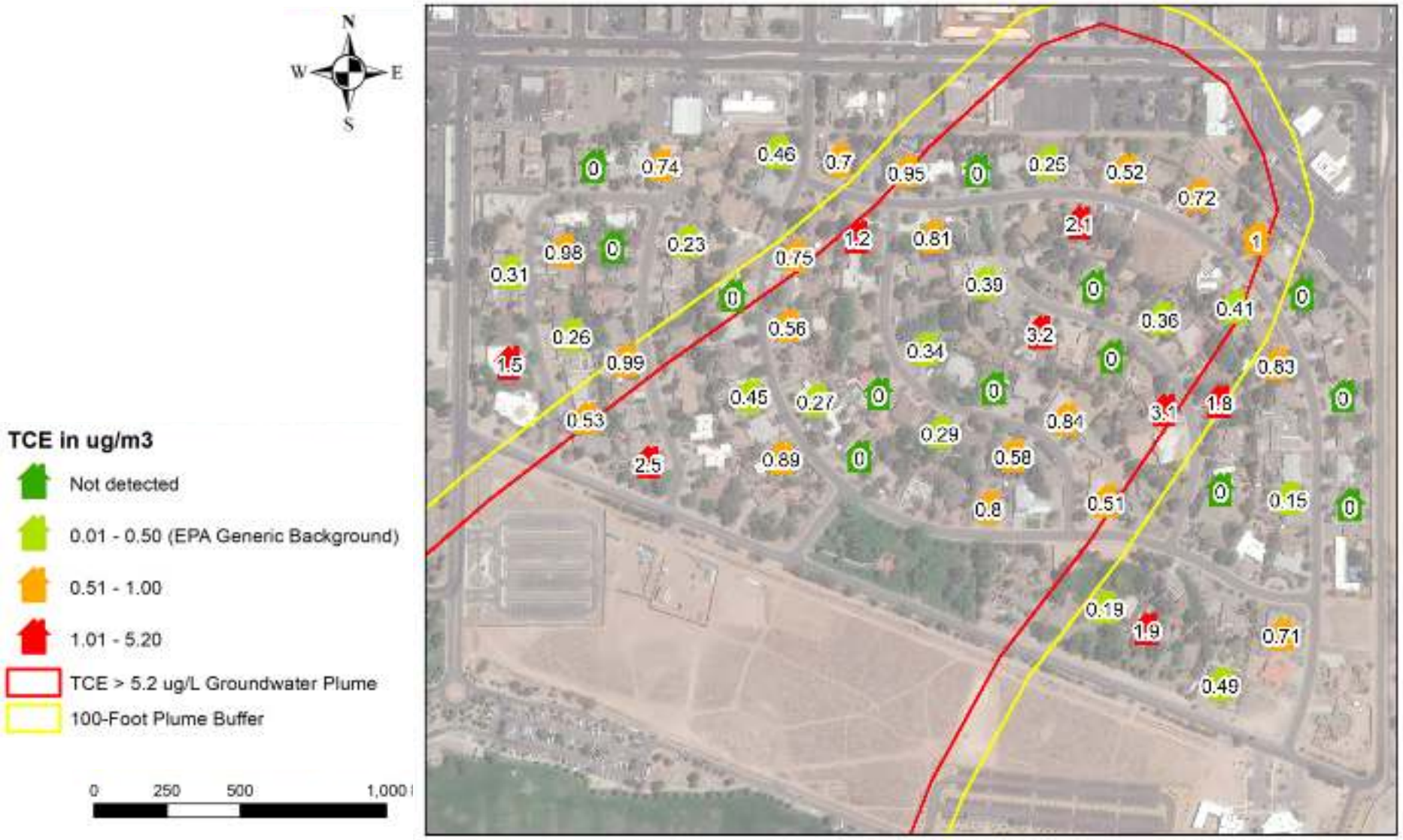
- EPA guidance – provides generic background concentrations. e.g., 0.5 µg/m3 TCE
- Site-specific – Recommended due to low-level TCE vapor found in all houses
  - Source unknown
  - Hazard Ranking Scoring guidance allows use of 3x highest background measured

Start
Step 1
Step 2
Step 3



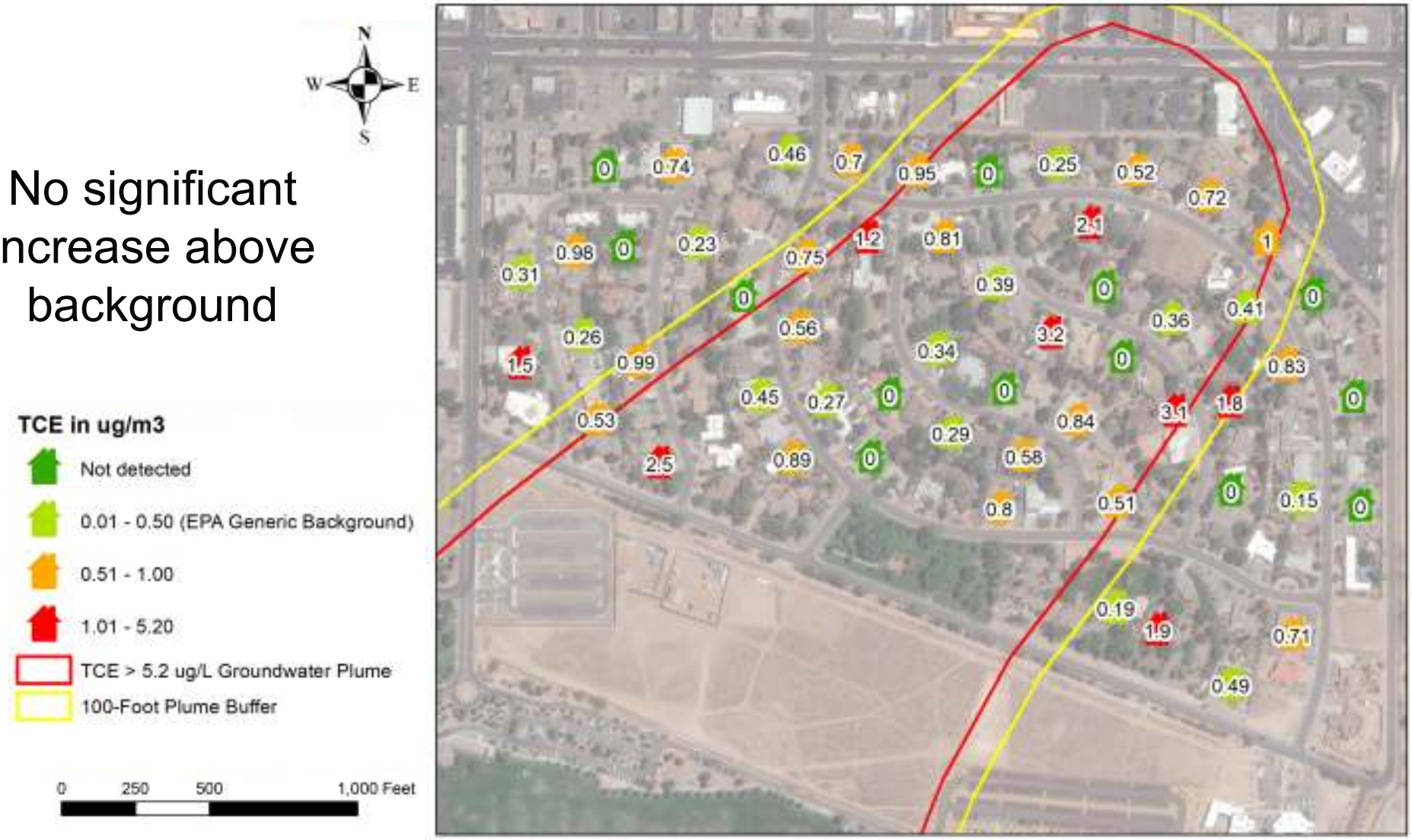
Background Level
Highest of houses A, B, C, M, N, O
Significant increase (3 x 7) at or above 21 at samples D, E, G, H, J, K

Site-specific Background = 1.9 ug/m3

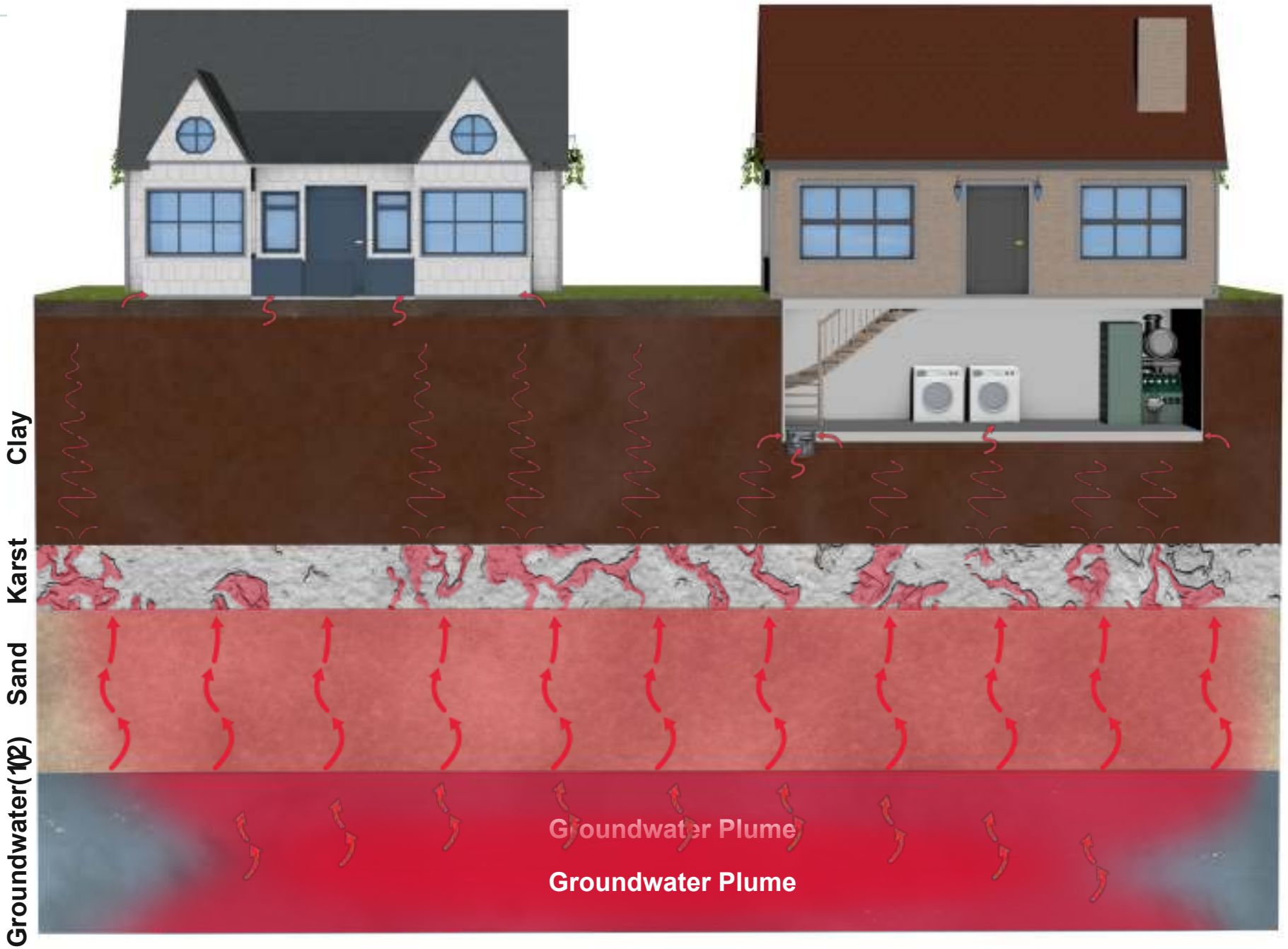


3 x Site-specific Background = 5.7 ug/m3

No significant increase above background



Home


Clay
Karst
Sand
Groundwater(1)(2)
Groundwater Plume
Groundwater Plume