



U.S. EPA “State of VI Science” Workshop
***Reducing Vapor Intrusion Uncertainties by More
Frequent Simple Measurements and Community
Involvement***

**Vapor Intrusion Assessment Challenges
and Environmental Justice**

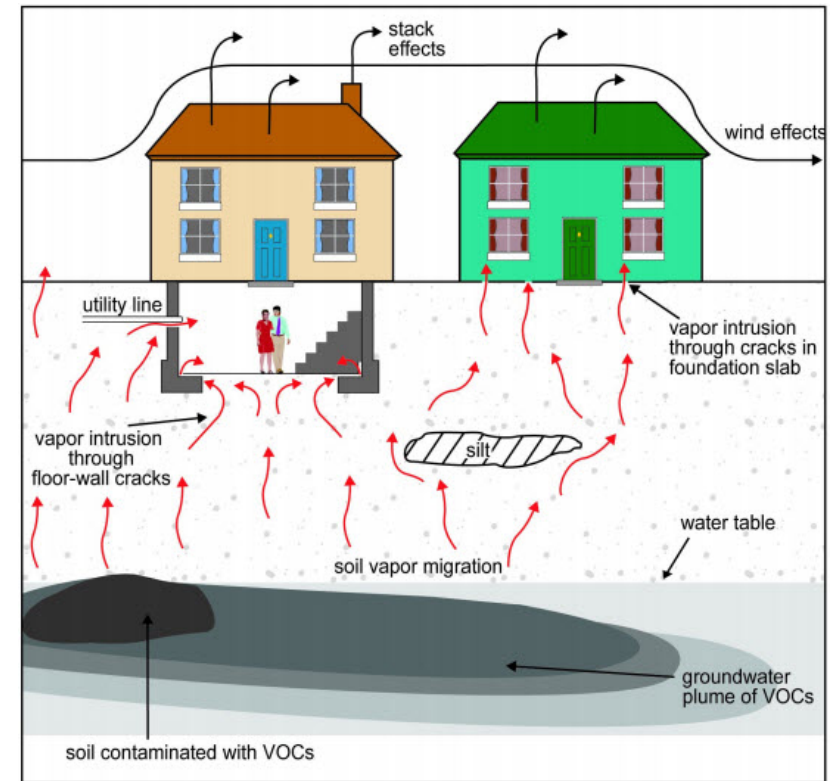
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VI Assessment Challenges

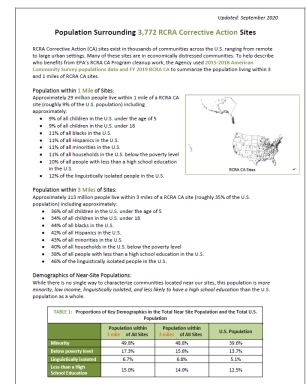
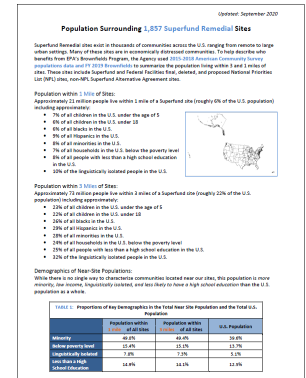
- Temporal and Spatial Variability
- Background and Ambient Chemical source
- Preferential and Conduit VI Pathways
- Sensitive or Disadvantaged Populations
- Timeframe and Assessment Window
- Prioritizing Buildings for Assessment



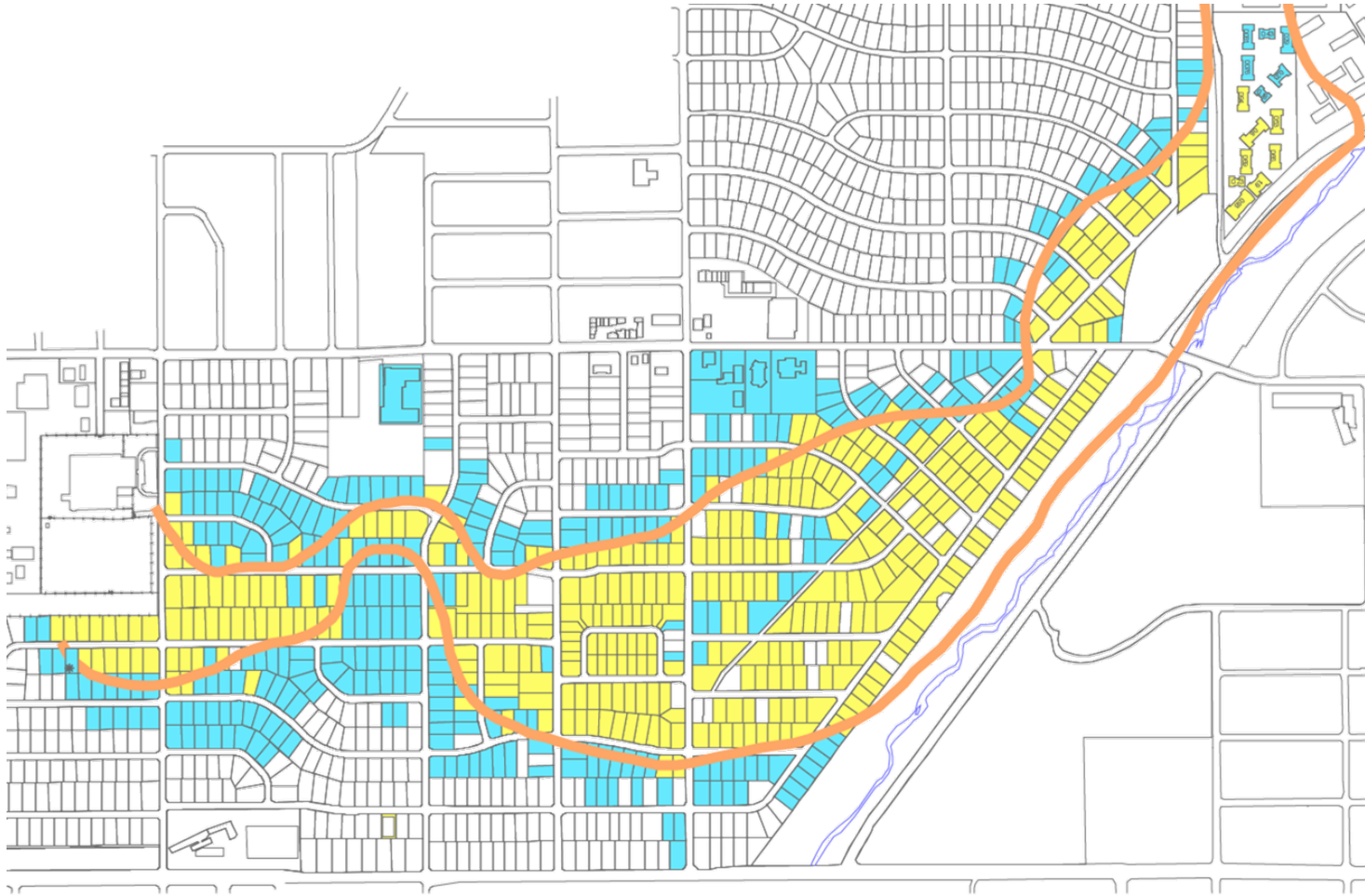
Defining and refining the VI CSM

RCRA Corrective Action and Superfund Sites

- More than 3,750 RCRA Corrective Action Sites and 1,850 Superfund Remedial sites across U.S. in rural and densely populated areas
- Within 3 mile of Superfund Sites:
 - ~22% of U.S. population
 - ~28% of all minorities in the U.S.
 - ~32% of linguistically isolated people in the U.S.
- Within 3 miles of RCRA Corrective Action Sites:
 - ~35% of U.S. population
 - ~43% of all minorities in the U.S.
 - ~46% of linguistically isolated people



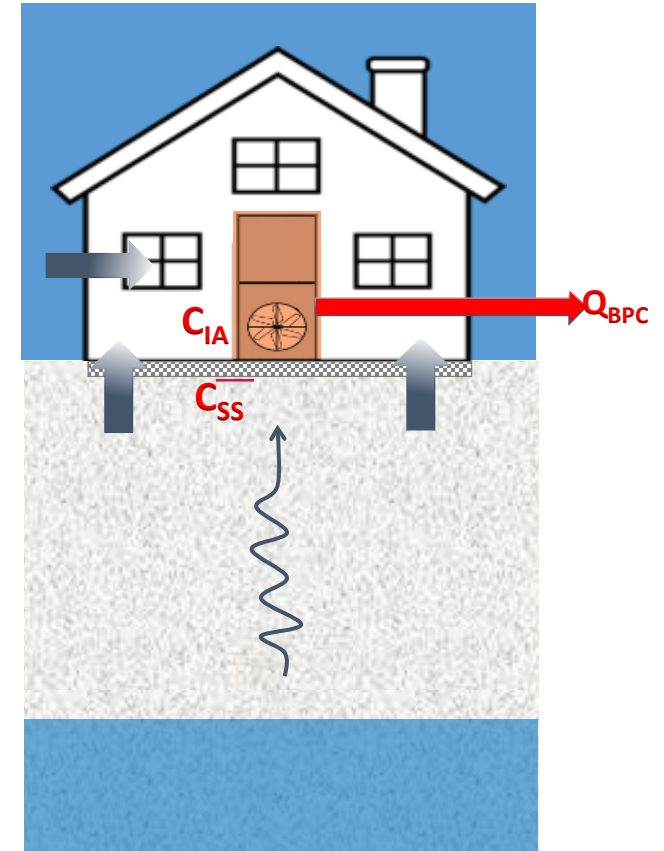
VI Assessment in Densely-Built Areas



Reference: Redfield Site, Denver, Colorado; see Folkes et al., 2009

Case Study: Reducing VI Uncertainty in Short Timeframes, BPC in Detroit and Flint, MI

- Brownfield redevelopment
- Low-income housing developments
- Potential for complete VI pathway
- Need documentation of due care compliance to begin occupancy



BPC Case Study, Detroit and Flint, MI

Reduced Variability

- Spatial
 - Integration of IA through single discharge (fan)
 - SS depressurization, draw vapors through potential cracks
- Temporal
 - Simulate pressure worst-case to account for all weather conditions
 - Depressurized results found to vary less than 2x (US DoD research, demonstration project ER201503)

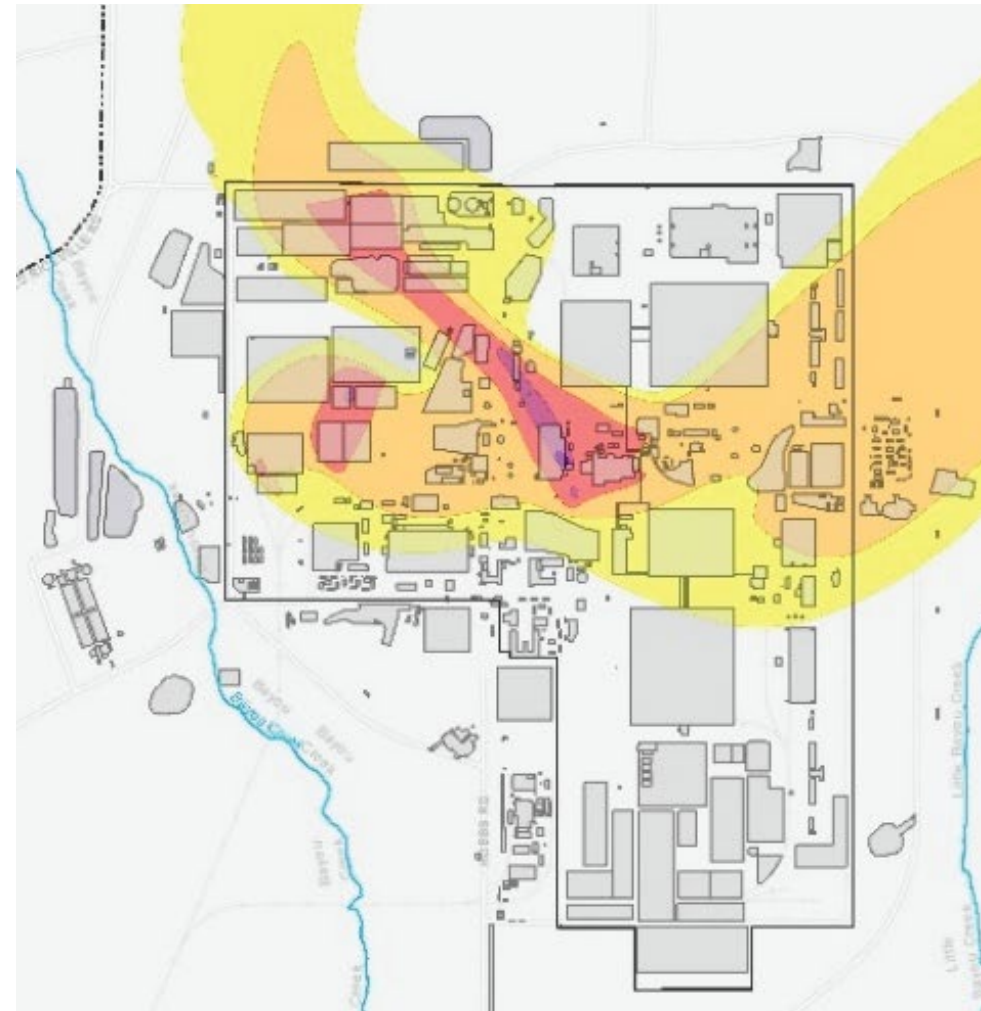
Protectiveness Factors

- Pressure ($>4x$)
- Detections and reporting limits v. screening criteria ($>10x$)
- Site-specific attenuation factor ($\sim 5X$)



Case Study: Prioritizing VI Assessment for Many Buildings, Kentucky

- DOE Facility, large campus
- Soil and groundwater sources of CVOCs
- Potential for complete VI pathway across site
- >350 occupied/occupiable commercial/industrial buildings
- Developed screening/ranking matrix to phase VI evaluations



Prioritization Case Study, Paducah, KY

