

EPA Update
Residential Groundwater and
Vapor Intrusion Sampling

Middlefield-Ellis-Whisman (MEW) Superfund Site
Mountain View and Moffett Field, CA

Wagon Wheel Neighborhood Association Meeting
March 3, 2013

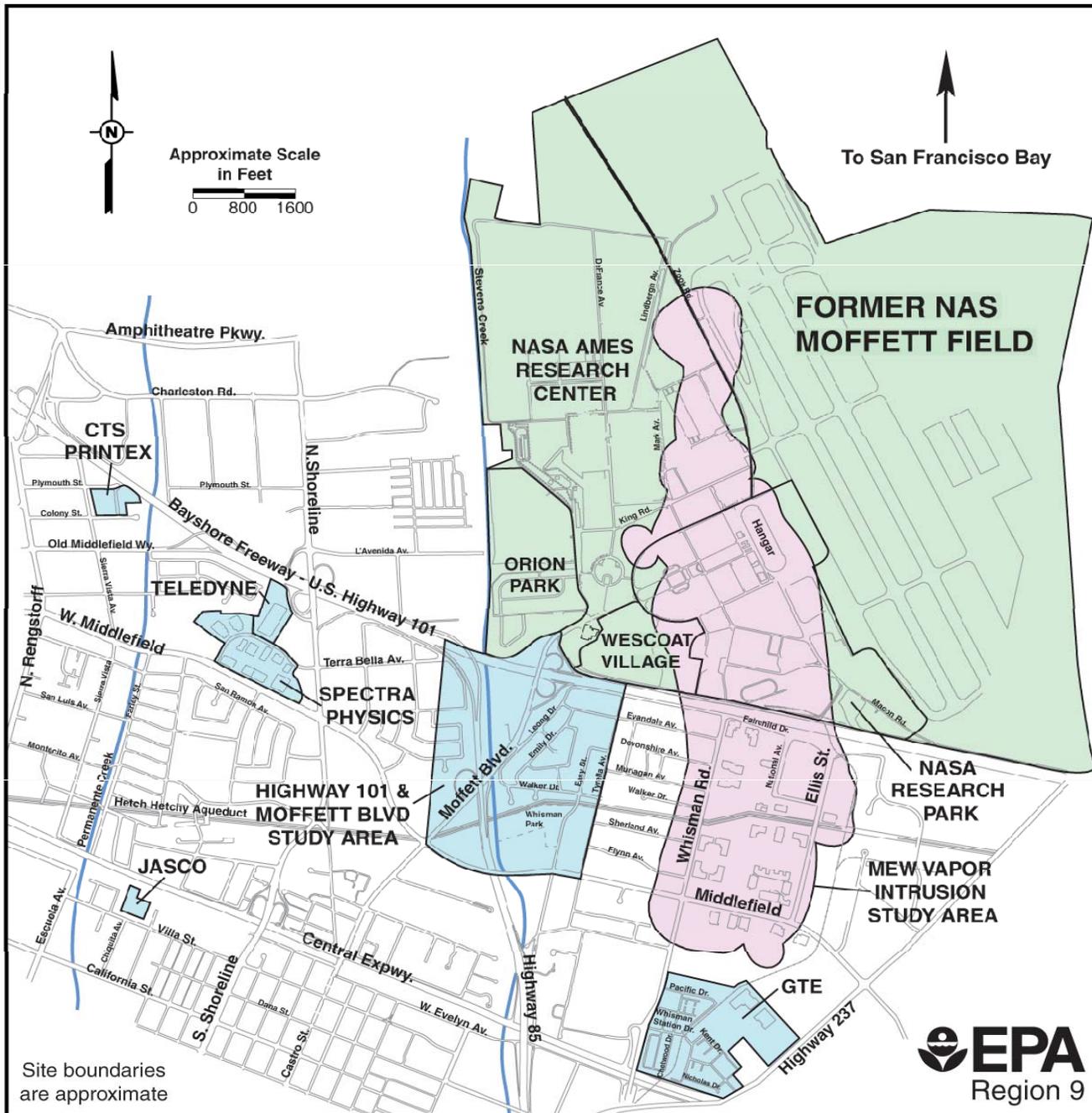


Overview

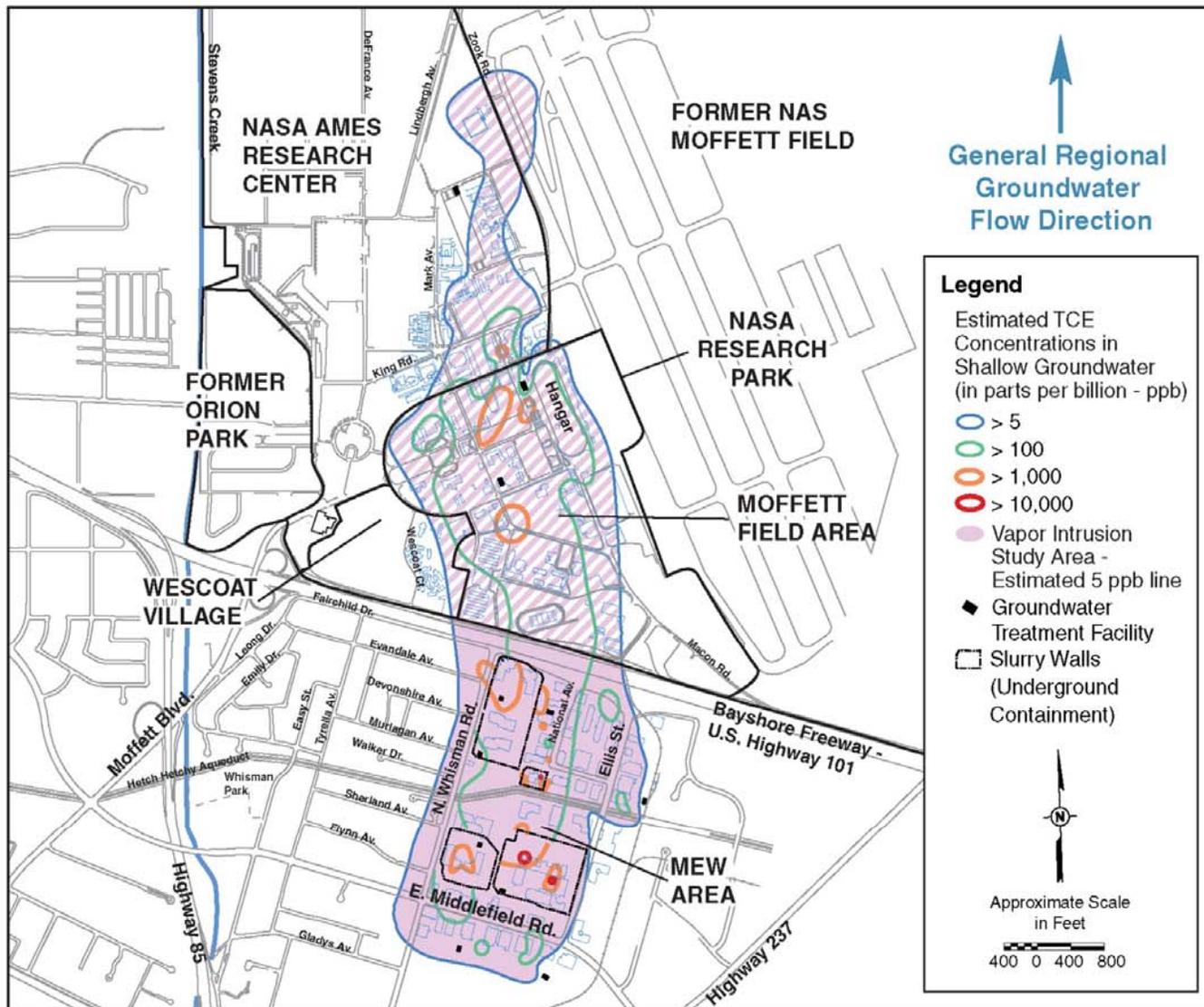


- Introductions
- Background/Overview of MEW Site Cleanup
- Vapor Intrusion Pathway and TCE
- Recent Groundwater Sampling and Next Steps
- Recent Indoor Air Sampling and Next Steps
- Questions

MEW SITE LOCATION AND VICINITY



Estimated Extent of Shallow TCE Groundwater Plume - 2009



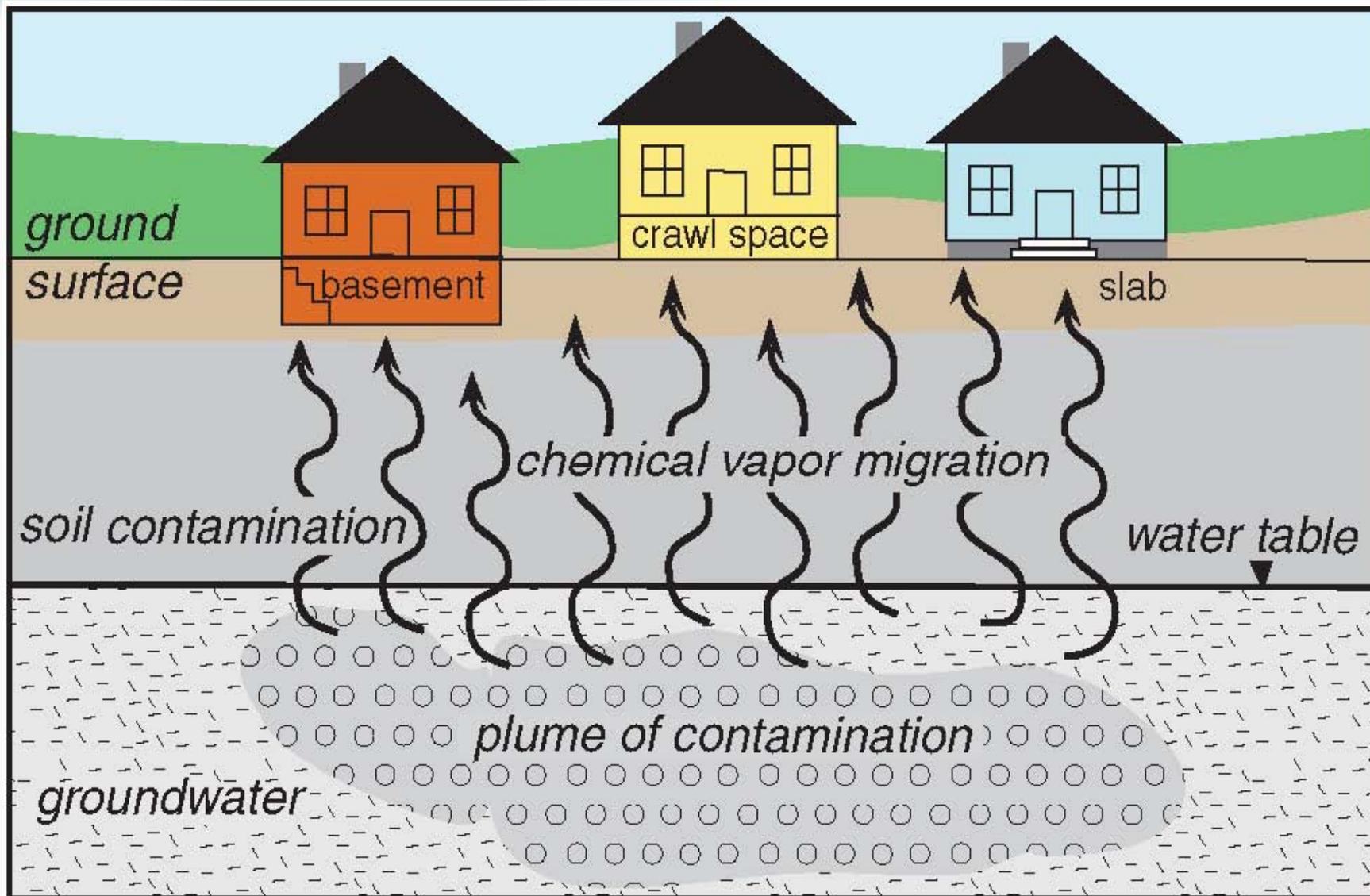
Groundwater Cleanup Progress

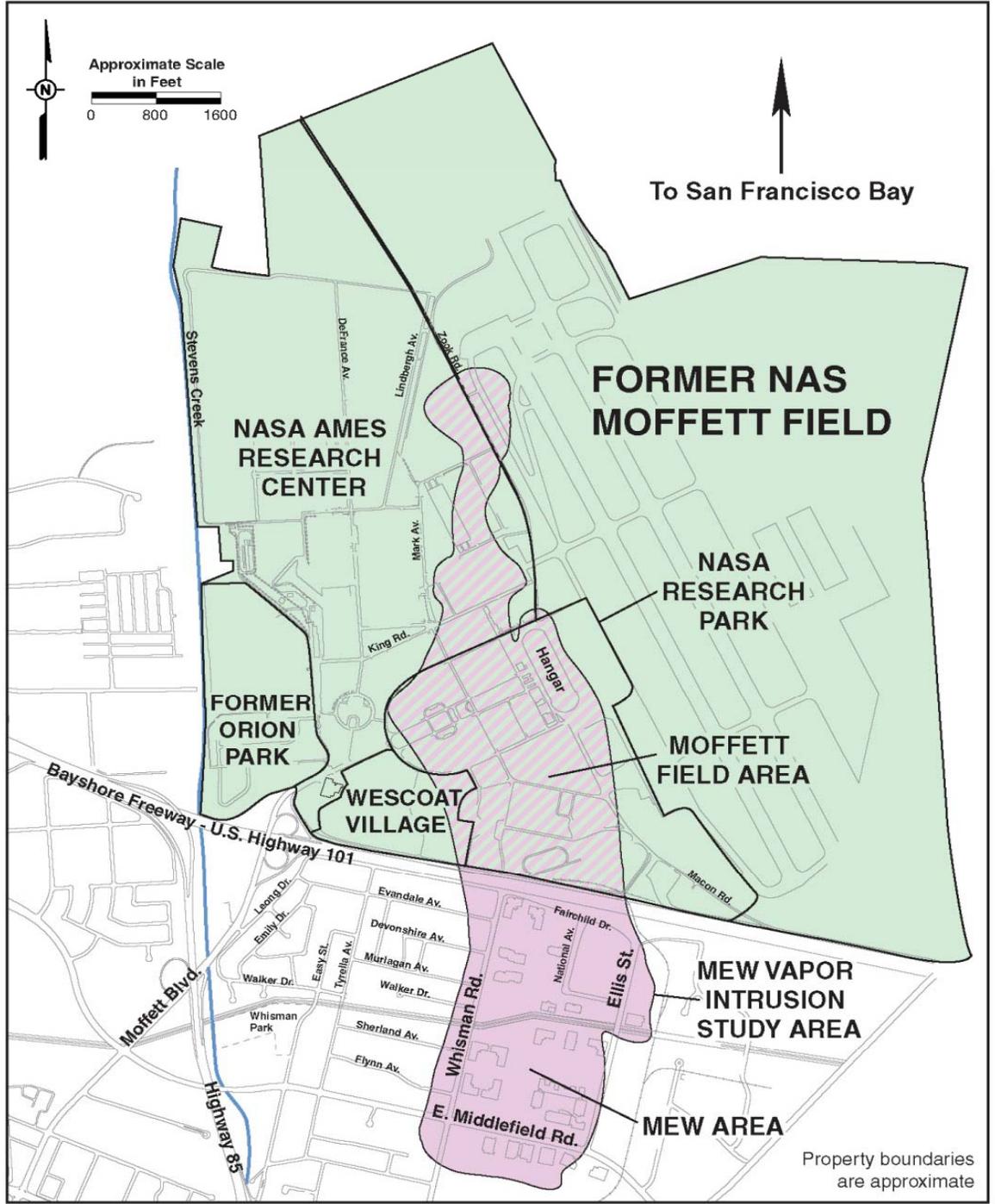


- Groundwater pump and treat to clean up and contain contamination. The TCE groundwater cleanup level is 5 micrograms per liter or parts per billion (ppb).
- Over 90 extraction wells pump approximately 500 gpm to 11 treatment systems.
- Over 5.25 billion gallons groundwater treated and over 100,000 pounds of contaminants removed, primarily TCE.
- Annual sampling of approximately 500 monitoring wells
- Water level measurements of nearly 1000 wells.

Note: Groundwater in this area is not used for drinking water or other potable use.

Vapor Intrusion Pathway





MEW Vapor Intrusion Study Area



- Generally defined by the area where TCE concentrations in shallow groundwater are greater than 5 micrograms per liter (ug/L), or parts per billion (ppb).
- In 2010, EPA selected a vapor intrusion remedy for the MEW Site, which applies to all existing and future residential and commercial buildings, within the MEW Vapor Intrusion Study Area.

What is TCE and why is it a concern?



- TCE or trichloroethene is a solvent used that was widely used in past for degreasing and cleaning.
- Can readily evaporate into air and has potential to migrate from shallow contaminated groundwater upwards into overlying buildings through the [vapor intrusion pathway](#).
- If TCE is in indoor air at high enough levels for a long enough duration, it may pose a potential health concern.

2011 TCE Health Assessment



- In September 2011, EPA finalized TCE Health Assessment (see *Toxicological Review of TCE* <http://www.epa.gov/iris/subst/0199.htm>)
- Assessment concluded TCE is human carcinogen. Can cause cancer in humans if exposed to high enough concentrations for a long enough period of time.
- TCE can also affect the central nervous system, kidneys and liver, male reproductive organs, and the developing fetus.

Potential Health Effects associated with TCE



- **Non-cancer**

- Acute effects-neurological
- Various organ systems
 - Liver
 - Kidney
- Immunological
- Reproductive
- Developmental

- **Cancer**

- Kidney
- Liver
- Lymphoma

- **Mode of Action**

- Mutagenic
- through metabolites

Potential Health Effects of TCE Depend on Many Factors



Potential health effects of TCE depend on many factors including:

- General health, age and lifestyle of the person
- How much a person is exposed to TCE (amount, duration)
- How often a person is exposed (frequency of exposure)

Recent Findings - Groundwater Work



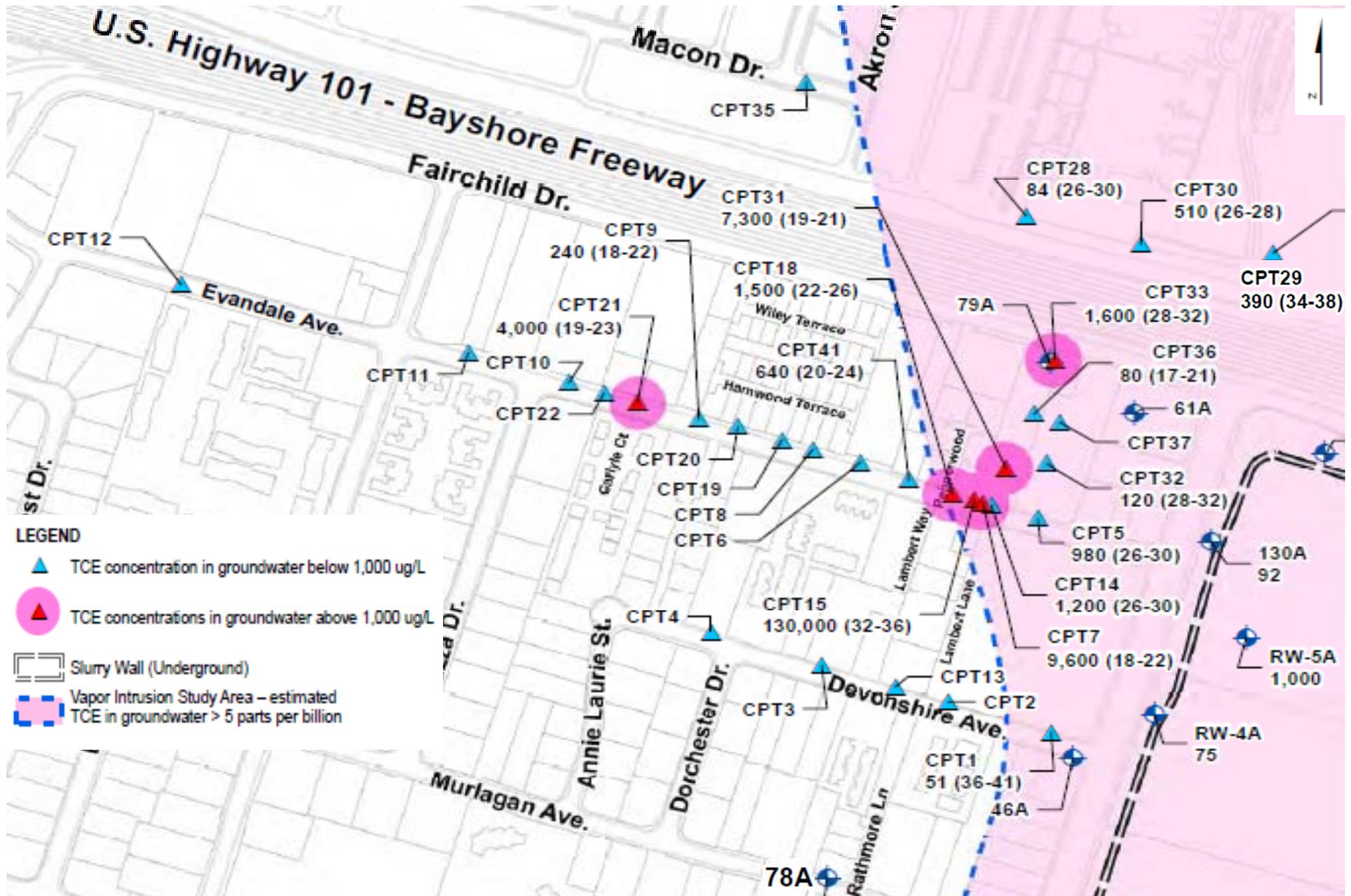
- Additional work in each of the five areas sampled confirmed the TCE groundwater contamination plume margins with the exception of one specific area below:

High TCE concentrations in two “hot spot” areas identified when stepping out from Whisman Road to the west along Evandale Avenue.

TCE Groundwater Results Along Western Margins – North of Highway 101 on Moffett Field



Maximum TCE Groundwater Results Western Margins – South of Highway 101 (Shallow A Aquifer)

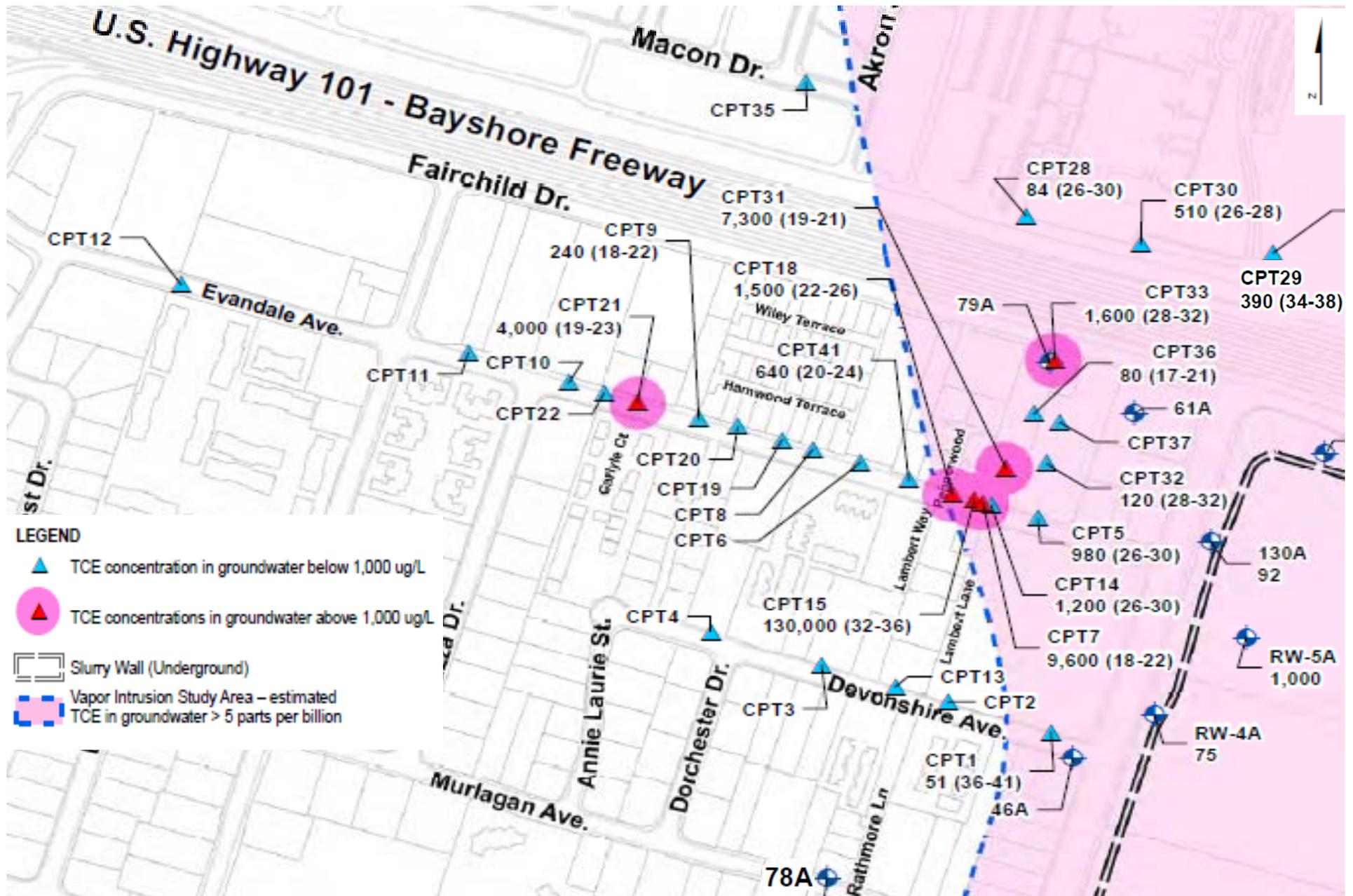


Groundwater – Next Steps



- Determine extent of hot spot areas with further step-outs in residential area south of 101
- Install extraction wells to clean up hot spot areas
- Finalize report summarizing data
- Install and sample monitoring wells near plume boundaries
- Review plume boundaries

Maximum TCE Groundwater Results Western Margins – South of Highway 101 (Shallow A Aquifer)



INDOOR AIR STANDARD FOR TCE (MEW STUDY AREA)

Health-Based Criteria

- Protective of Cancer Effects
- Protective of Non-Cancer Effects
- Protective of both Short-Term and Long-Term Exposures

Margin of Safety

- Accounts for Sensitive Groups
- Data Gaps in the Science

Other Considerations

- Can be Reliably Measured using Current Laboratory Methods
- Typically Above “Background” TCE Levels Measured in Mountain View Air
- Two TCE Standards Account for Different Exposures that Occur in Homes vs. the Workplace

Residential Standard for TCE in Air = $1 \mu\text{g}/\text{m}^3$

Worker Standard for TCE in Air = $5 \mu\text{g}/\text{m}^3$

$\mu\text{g}/\text{m}^3$ = micrograms
per cubic meter

Initial Indoor Air Sampling Results

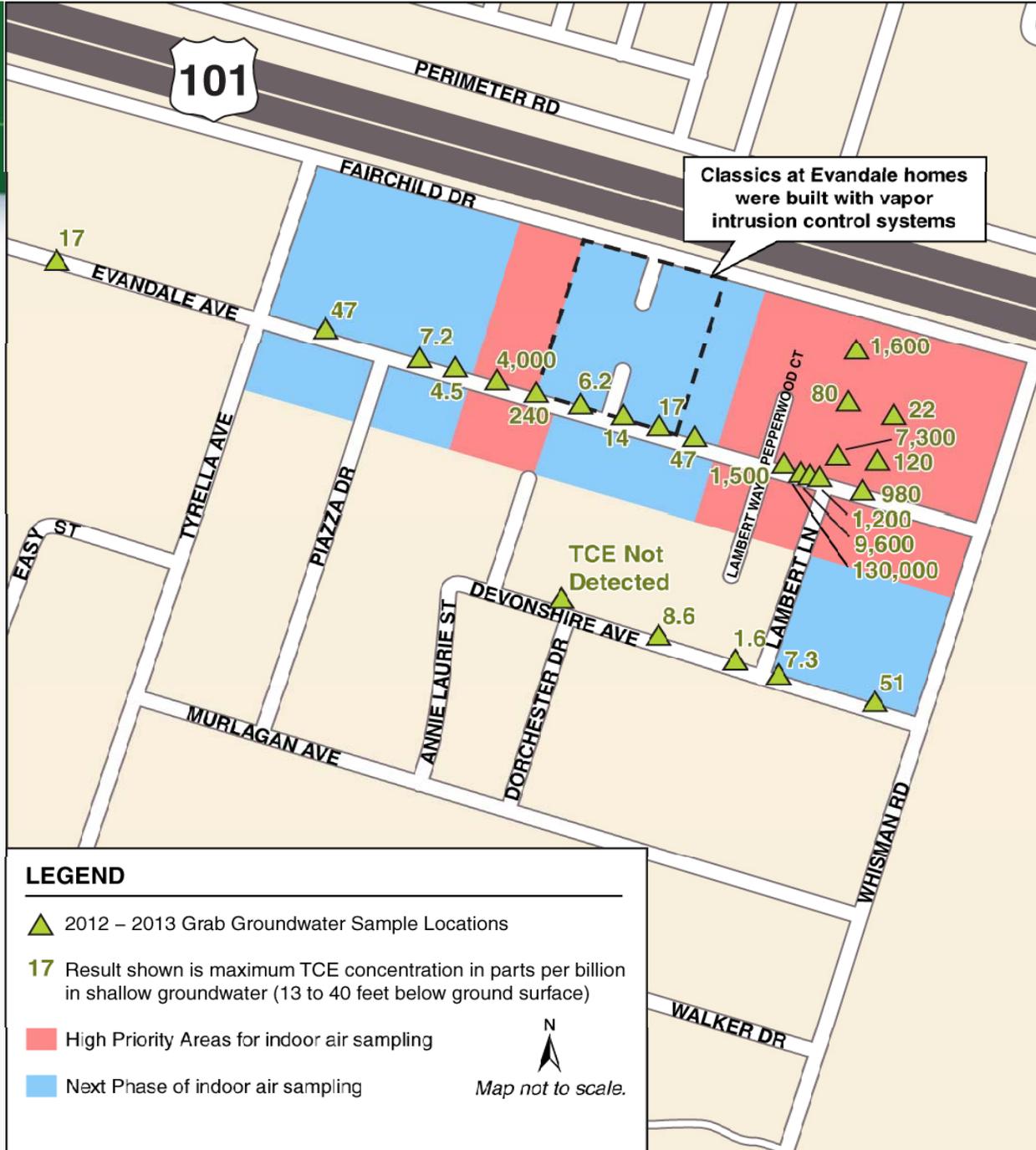


- EPA sampled 30 residences in high priority areas
- No TCE was detected in most residences sampled.
- TCE was detected in a few residences, but below indoor air cleanup levels. Homes being re-sampled to confirm TCE below indoor air cleanup levels.
- TCE was found in two residences exceeding EPA's TCE indoor air cleanup level.
- One vapor intrusion control system installed; the second one being designed to mitigate TCE indoor air concentrations

Next Steps - Vapor Intrusion



- Results from high priority area indoor air sampling showed vapor intrusion not a problem in most residences sampled.
- Based on groundwater and air sampling to date, areas outside the high priority areas that overlie lower TCE groundwater concentrations are considered as low vapor intrusion risk.
- For homes outside of high priority areas overlying lower TCE groundwater concentrations, residents have option to have homes sampled (see blue highlighted area)
- Next phase of indoor air sampling to begin March 2013.



2012 – 2013 Groundwater Results - TCE in Shallow Groundwater

How do I have my residence sampled?



Residences within MEW Site Vapor Intrusion Study Area – overlying shallow TCE groundwater contamination exceeding 5 ppb may be sampled

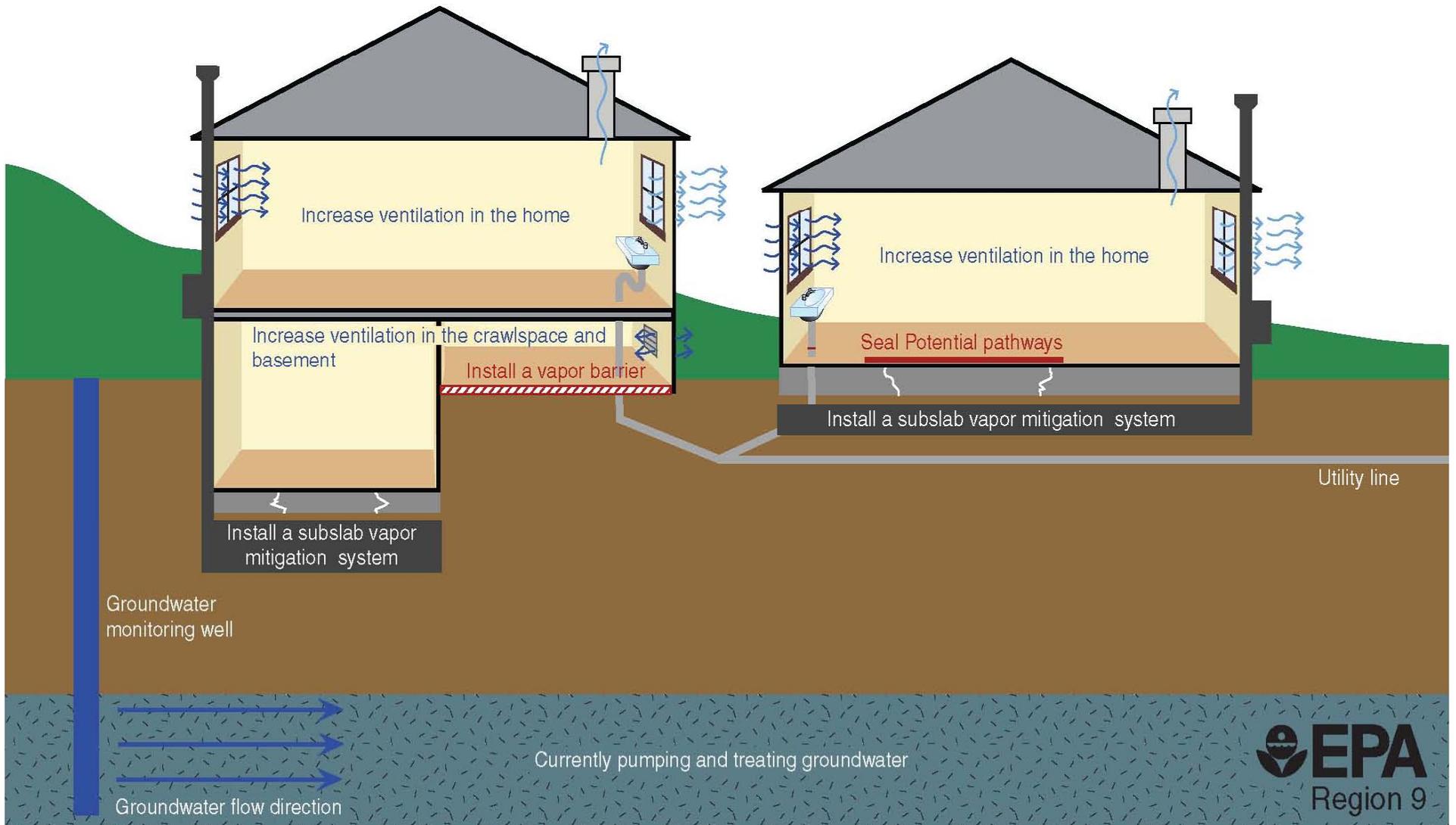
- Contact EPA with your residence address, phone number, and email, and EPA representative will get in touch with you.
- Permission to sample must be obtained from property owner.
- Ground floor units only of multi-unit buildings
- Residences without vapor intrusion control systems sampled before those with systems in place.

What if there is a vapor intrusion problem in home?



- If indoor air sampling results show TCE from vapor intrusion exceeding EPA's indoor air cleanup level of 1 ug/m³, EPA recommends installation of a vapor intrusion control system
- Includes sealing potential conduits and installing sub-slab or sub-membrane vapor intrusion control system
- At no cost to homeowner or resident

SOME VAPOR INTRUSION MITIGATION OPTIONS - RESIDENCES



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EPA Websites – For More Information

www.epa.gov/region9/mew
www.epa.gov/region9/moffettfield
www.epa.gov/oswer/vaporintrusion

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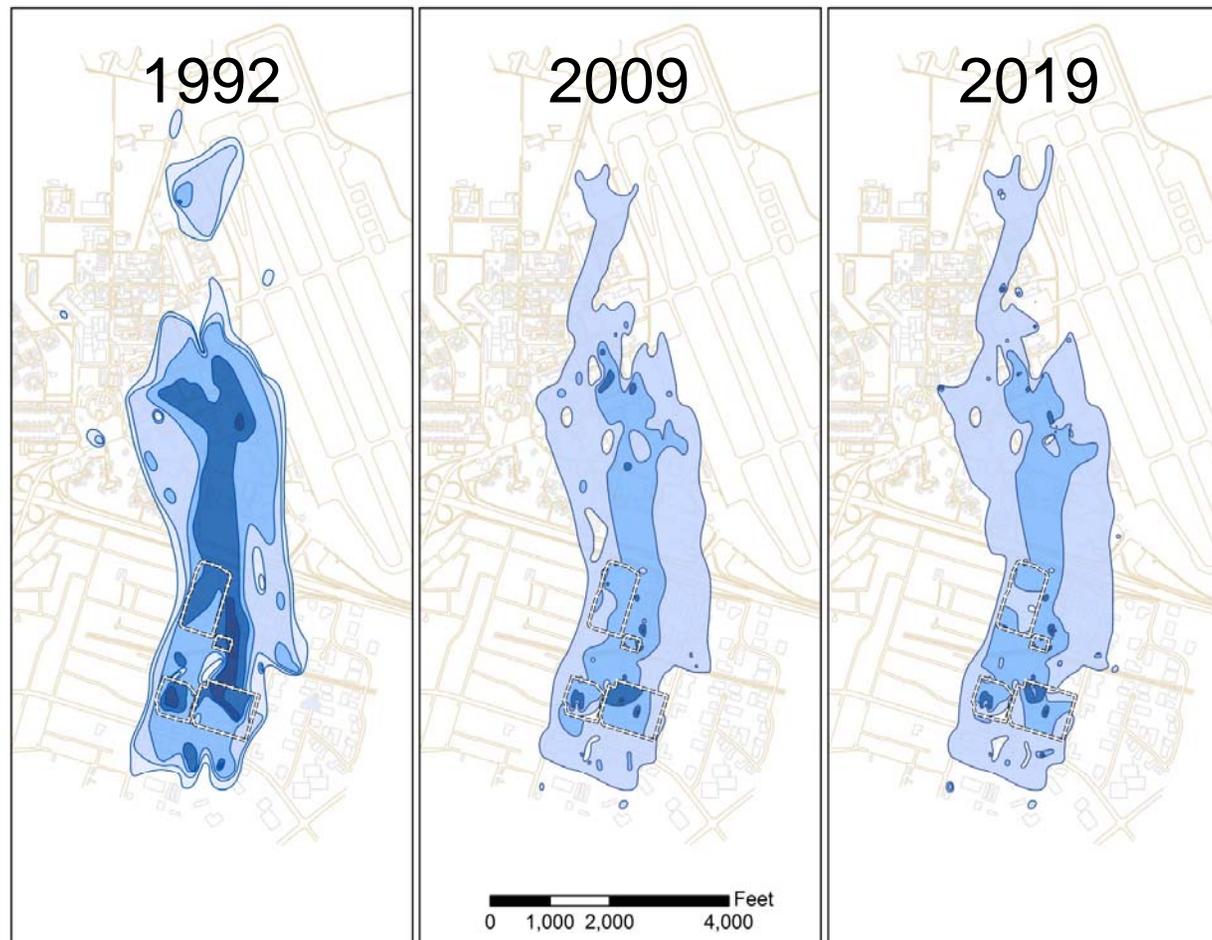
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Additional Slides

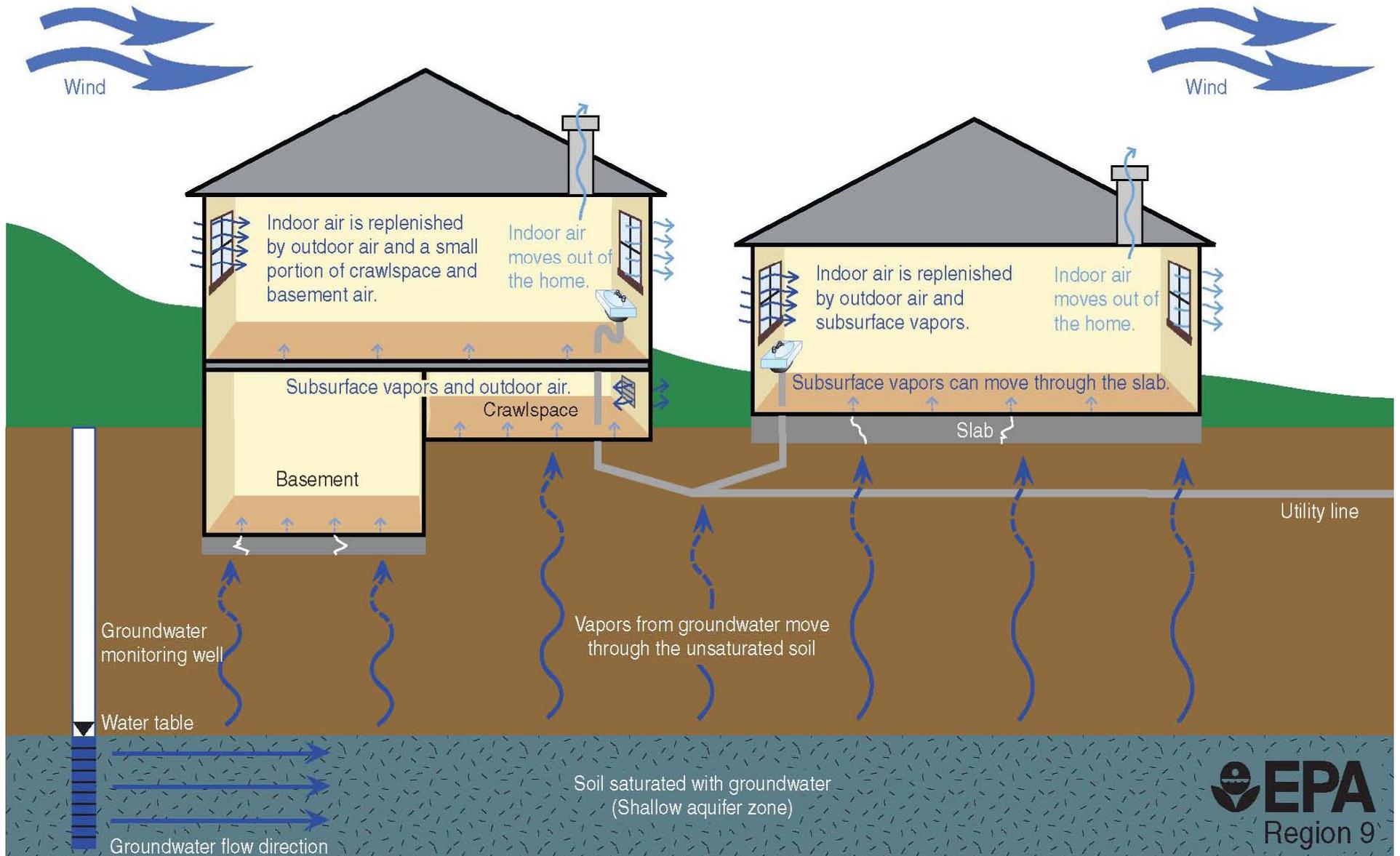




Projected TCE Groundwater Contamination Plume Shallow A/A1 Aquifer (0 to 45 feet bgs)



VAPOR INTRUSION PATHWAY



TYPES OF AIR SAMPLES - POTENTIAL LOCATIONS

