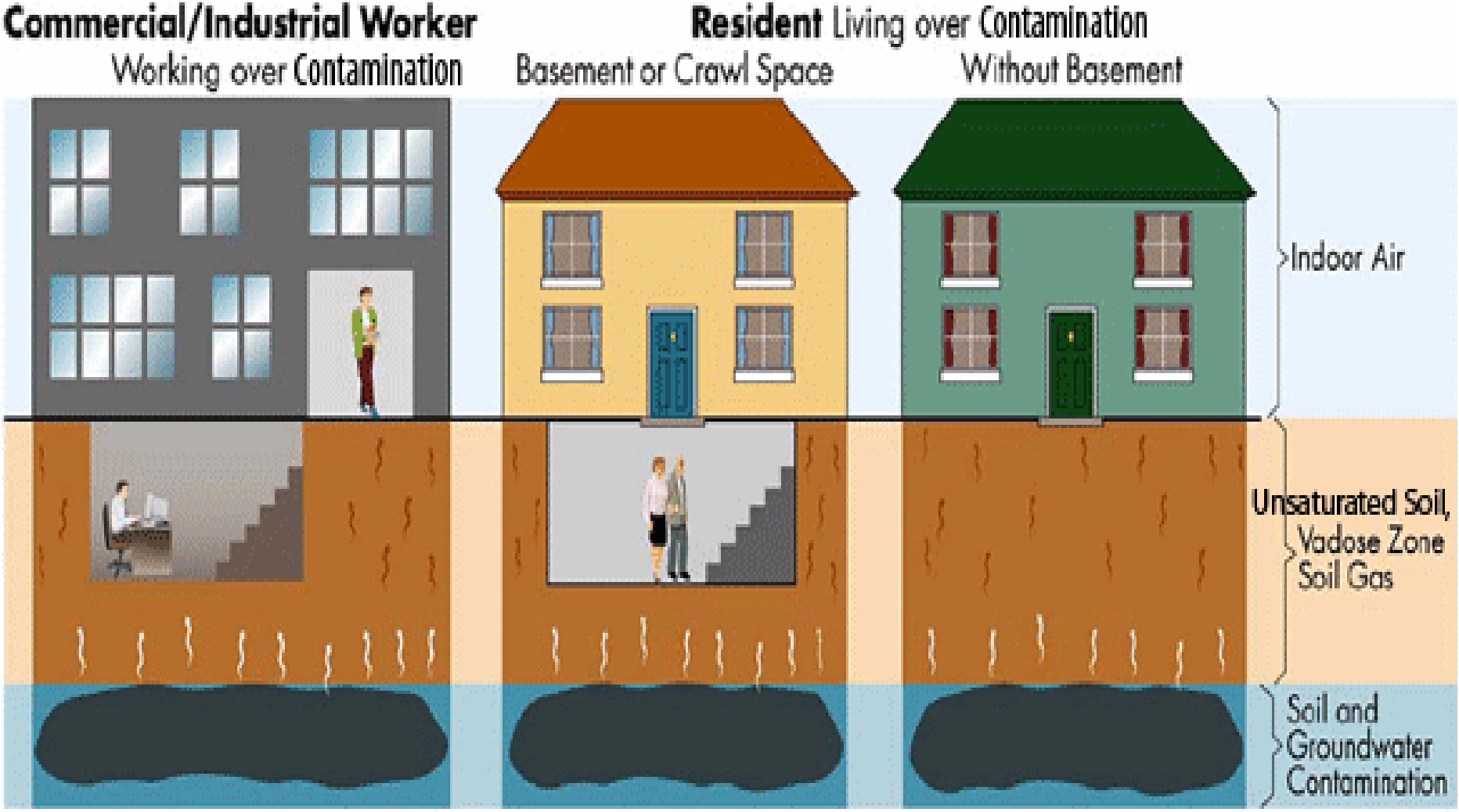
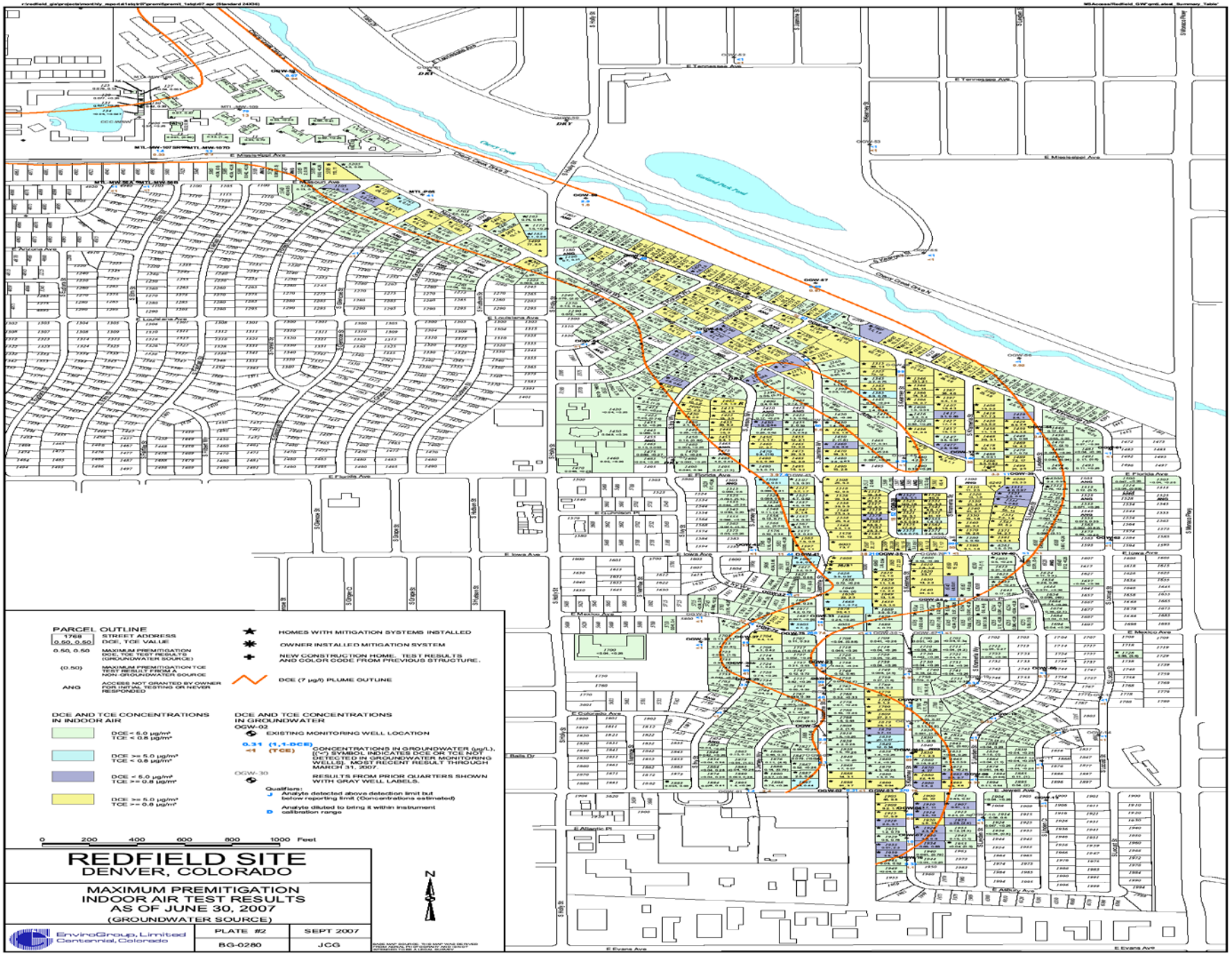
Vapor Intrusion: Regulatory and Legal Developments

Lawrence Schnapf
Schnapf LLC
New York, NY 10128
Larry@SchnapfLaw.com
www.SchnapfLaw.com
212-756-2205

"GAS PROBLEM? TAKE THIS CUPOLEX AND CALL ME IN THE MORNING."

What Is VI-2002

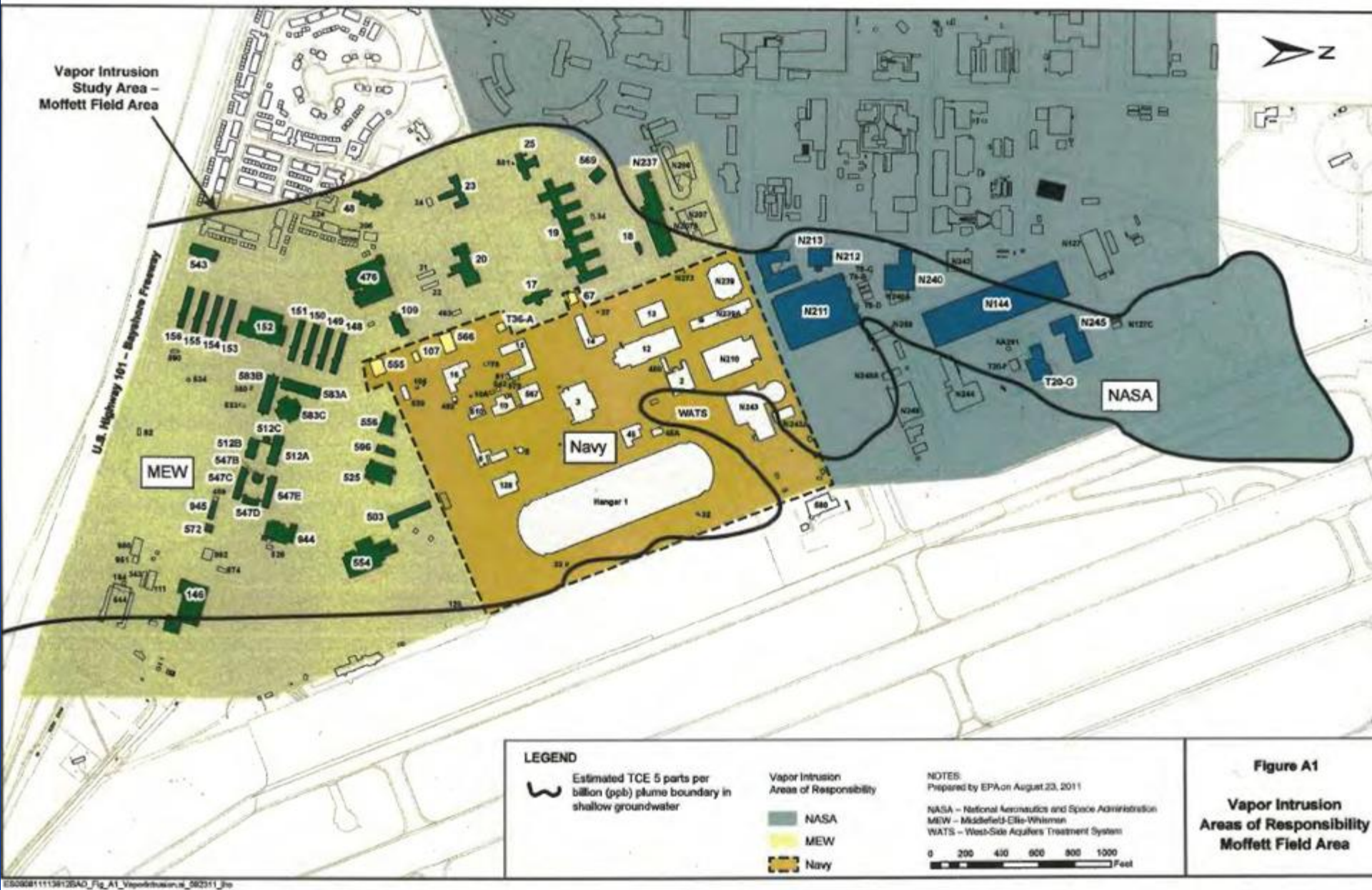


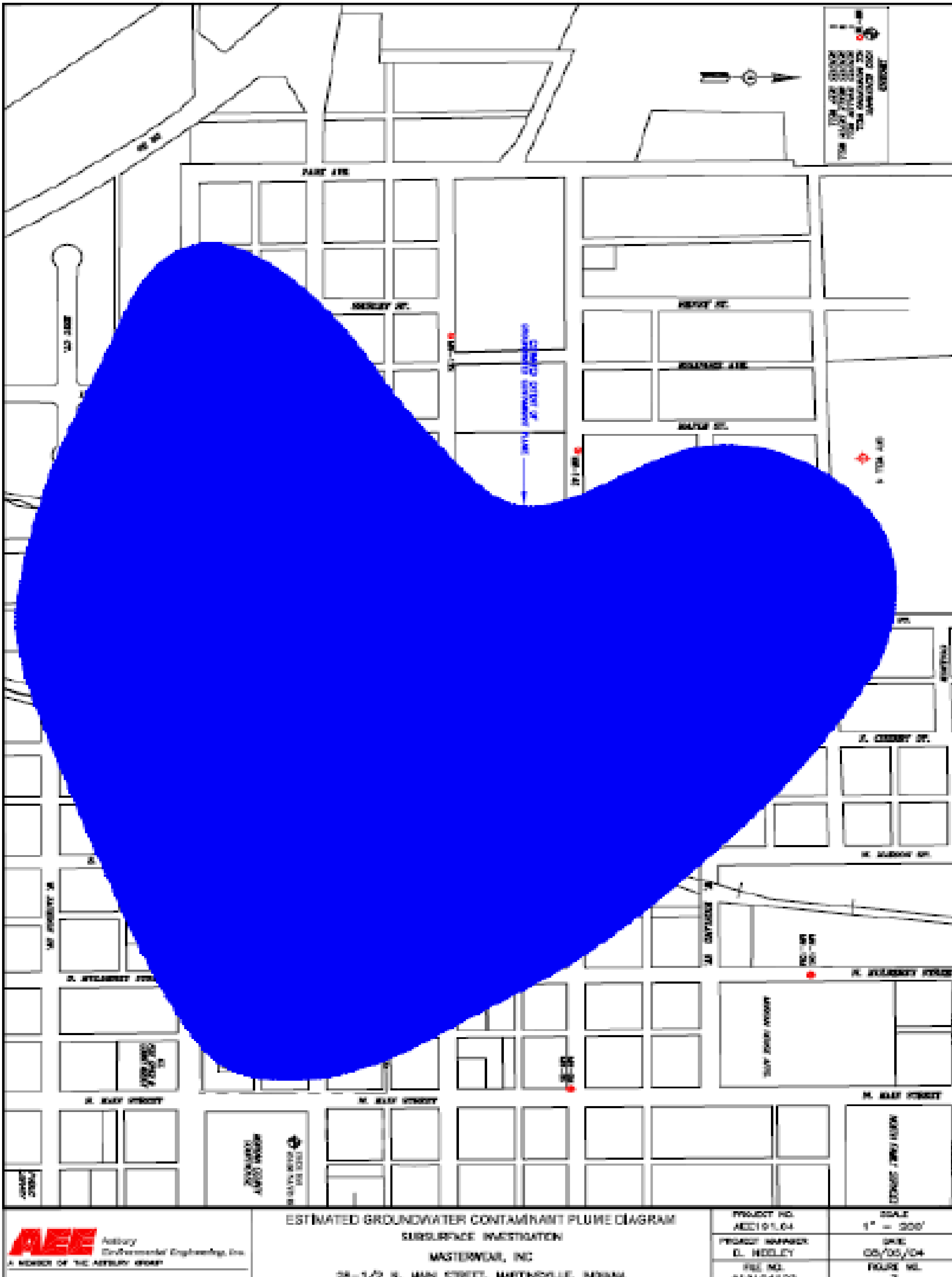

PARCEL OUTLINE
1768 STREET ADDRESS
0.50, 0.50 DCE, TCE VALUE
0.50, 0.50 MAXIMUM PREMITIGATION TCE TEST RESULTS (GROUNDWATER SOURCE)
(0.50) MAXIMUM PREMITIGATION TCE TEST RESULT FROM A NON-GROUNDWATER SOURCE
ANG ACCESS NOT GRANTED BY OWNER FOR INITIAL TESTING OR NEVER RESPONDED
HOMES WITH MITIGATION SYSTEMS INSTALLED
OWNER INSTALLED MITIGATION SYSTEM
NEW CONSTRUCTION HOME. TEST RESULTS AND COLOR CODE FROM PREVIOUS STRUCTURE.
DCE (7 µg/l) PLUME OUTLINE
DCE AND TCE CONCENTRATIONS IN INDOOR AIR
DCE < 5.0 µg/m³ TCE < 0.8 µg/m³
DCE >= 5.0 µg/m³ TCE < 0.8 µg/m³
DCE < 5.0 µg/m³ TCE >= 0.8 µg/m³
DCE >= 5.0 µg/m³ TCE >= 0.8 µg/m³
DCE AND TCE CONCENTRATIONS IN GROUNDWATER OGW-02
EXISTING MONITORING WELL LOCATION
0.31 (1,1-DCE)
<1 (TCE)
CONCENTRATIONS IN GROUNDWATER (µg/L), ("<") SYMBOL INDICATES DCE OR TCE NOT DETECTED IN GROUNDWATER MONITORING WELLS). MOST RECENT RESULT THROUGH MARCH 31, 2007.
OGW-30
RESULTS FROM PRIOR QUARTERS SHOWN WITH GRAY WELL LABELS.
Qualifiers:
J Analyte detected above detection limit but below reporting limit (Concentrations estimated)
D Analyte diluted to bring it within instrument calibration range
0 200 400 600 800 1000 Feet
N
REDFIELD SITE
DENVER, COLORADO
MAXIMUM PREMITIGATION INDOOR AIR TEST RESULTS AS OF JUNE 30, 2007
(GROUNDWATER SOURCE)
EnviroGroup, Limited Centennial, Colorado
PLATE #2
SEPT 2007
BG-0280
JCG

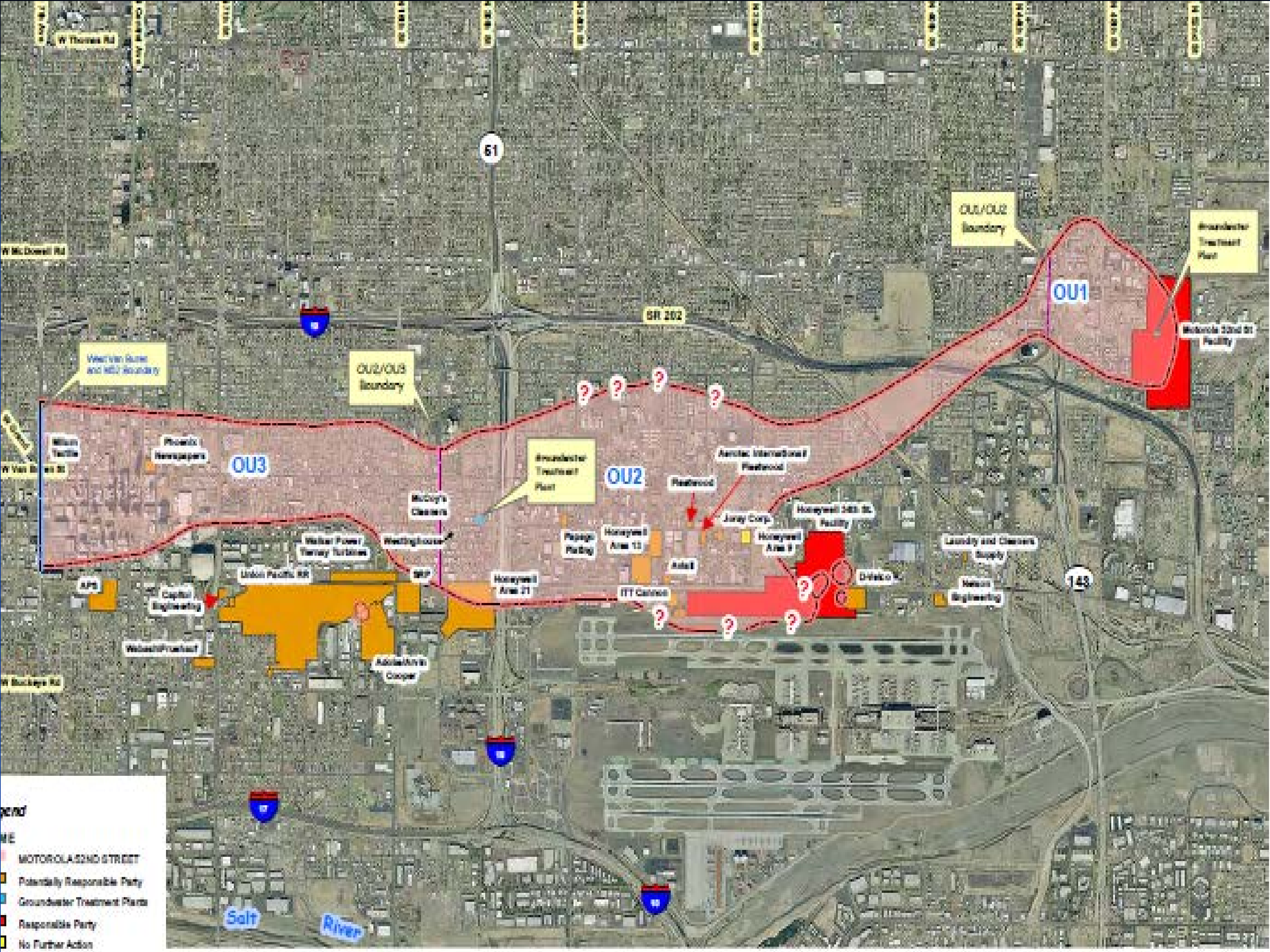
Source: U.S. EPA

STAFF MAP

The Middlefield-Ellis Whisman (MEW) Superfund Study Area in Mountain View and Moffett Field, California




ESTIMATED GROUNDWATER CONTAMINANT PLUME DIAGRAM
SUBSURFACE INVESTIGATION
MASTERWEAR, INC
28-1/2 N. MAIN STREET, MARTINSVILLE, INDIANA
PROJECT NO.
AEE191.04
PROJECT MANAGER
D. NEELEY
FILE NO.
AE9104102
SCALE
1" = 200'
DATE
08/05/04
FIGURE NO.
3
Astbury Environmental Engineering, Inc.
A MEMBER OF THE ASTBURY GROUP
N. MAIN STREET
W. MORGAN ST.
N. SYCAMORE STREET



W Thomas Rd
W McDowell Rd
W Buckeye Rd
61
SR 202
143
OU1/OU2 Boundary
OU2/OU3 Boundary
Groundwater Treatment Plant
OU1
OU2
OU3
Motorola 52nd St Facility
Phoenix Newspapers
Westinghouse
Walker Power Tierney Turbines
Union Pacific RR
Capitol Engineering
APS
Honeywell Area 21
Honeywell Area 12
Honeywell Area 9
Honeywell 34th St. Facility
ITT Cannon
Joray Corp.
Laundry and Cleaners Supply
Nelson Engineering
Salt
River
MOTOROLA 52ND STREET
Potentially Responsible Party
Groundwater Treatment Plants
Responsible Party
No Further Action

CVI EPA Support Documents

- Background Indoor Air Concentrations of VOCs in North American Residences (1990 – 2005
- EPA VI Database:
- Conceptual Model Scenarios for the VI Pathway
- Indoor Air Vapor Intrusion Mitigation Approaches
- Sampling and Analytical Methods for VI Investigations
- Technical Basis for Selection, Design, Installation and O&M of VI Mitigation Systems
- Vapor Intrusion Screening Levels (VISL) User's Guide

Other EPA Guidance

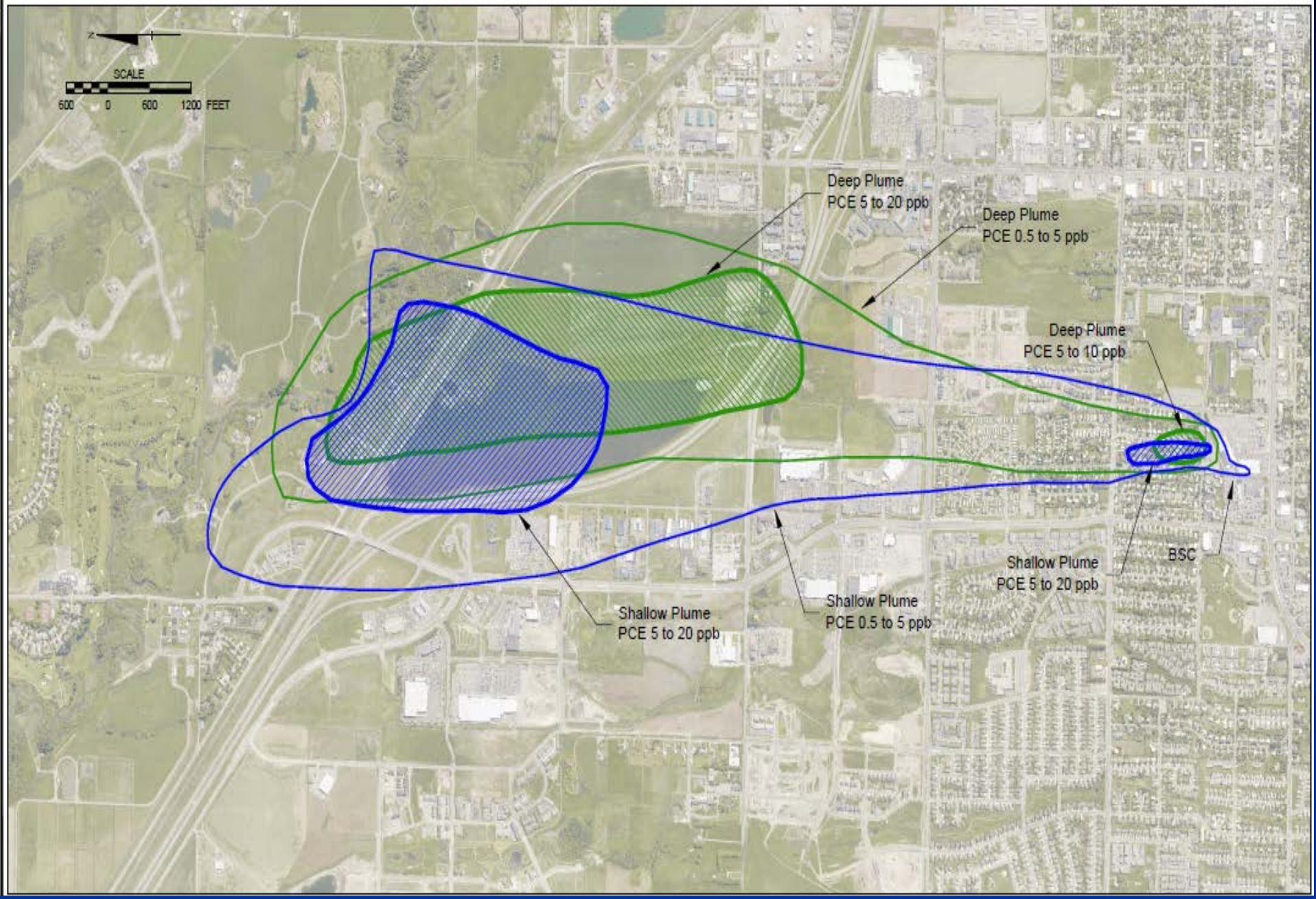
- Assessing Protectiveness at Sites For Vapor Intrusion: Supplemental Guidance to the Comprehensive Five-Year Review Guidance (OSWER 9200.2-84)
- Operation and Functional Determination and the Transfer of Fund-lead Vapor Intrusion Mitigation Systems to the State (OSWER 9200-2.72)
- EPA Region 5 Vapor Intrusion Guidebook (Oct 2010)
- Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment (March 2008)

Other VI Guidance

- Air Force Guide for the Assessment of the Vapor Intrusion Pathway (2006)
- Army Interim Vapor Intrusion Policy (2006)
- ATSDR Evaluating Vapor Intrusion Pathways at Hazardous Waste Sites (2008)
- Navy/Marine Corps Policy on Vapor Intrusion (2008)
- Tri-Services (2008) Handbook for the Assessment of the Vapor Intrusion Pathway: Final Draft (Army, Navy, Air Force 2008)
- DOD Vapor Intrusion Handbook (2009)
- US Postal Service Vapor Intrusion Guidance (2009)
- US Navy Facilities VI Multimedia Training Tools Website (2010)

Dry Cleaners: Not So Clean

- 75% have had releases that have impacted soil or groundwater
- Leading cause of PCE contamination in California is dry cleaners discharging to sewers (Izzo 1992)
- 2nd Common Source of Contaminated Sites in NY


SCALE
600 0 600 1200 FEET
Deep Plume
PCE 5 to 20 ppb
Deep Plume
PCE 0.5 to 5 ppb
Deep Plume
PCE 5 to 10 ppb
Shallow Plume
PCE 5 to 20 ppb
Shallow Plume
PCE 0.5 to 5 ppb
Shallow Plume
PCE 5 to 20 ppb
BSC

Revised 2-10-2010

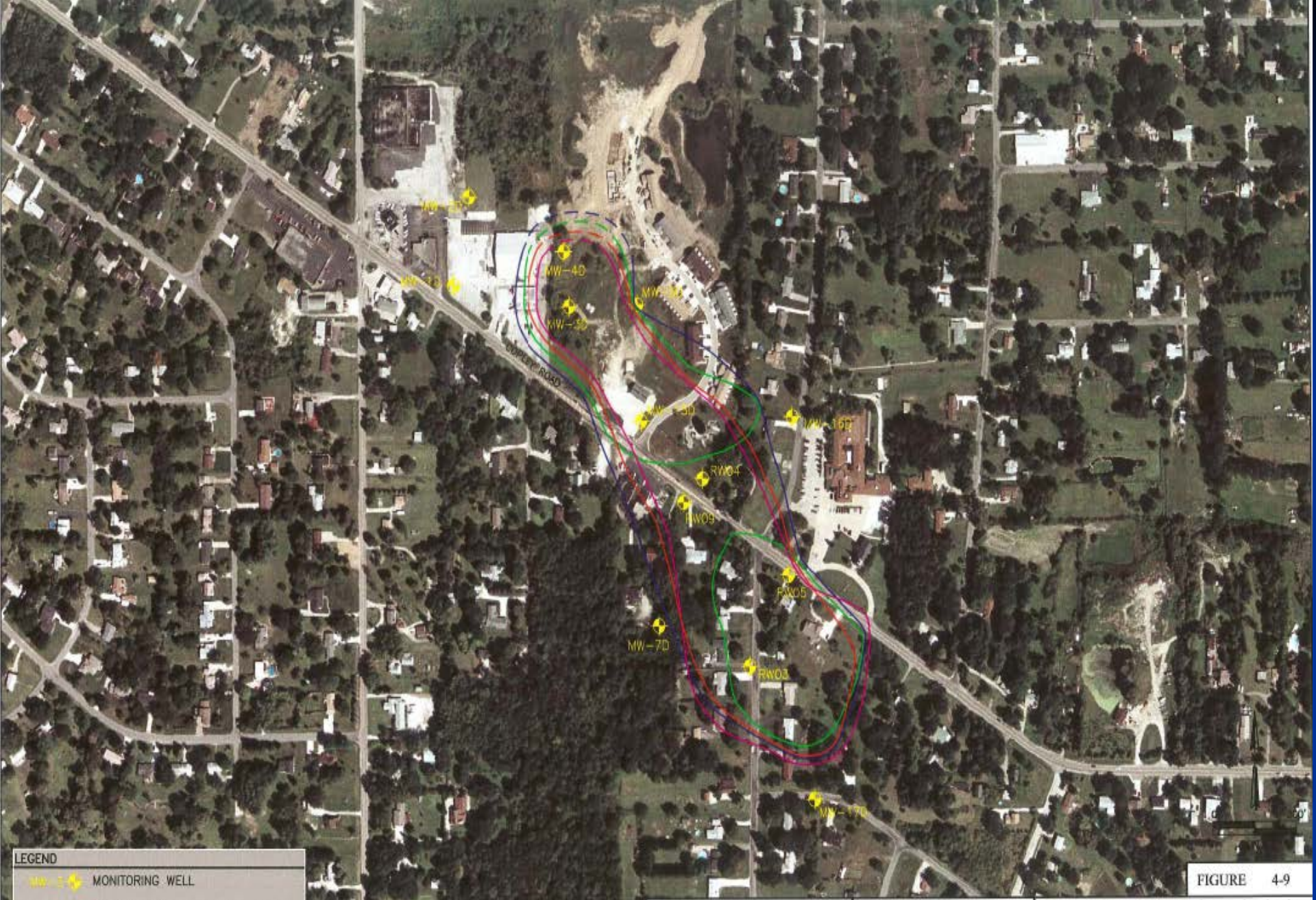


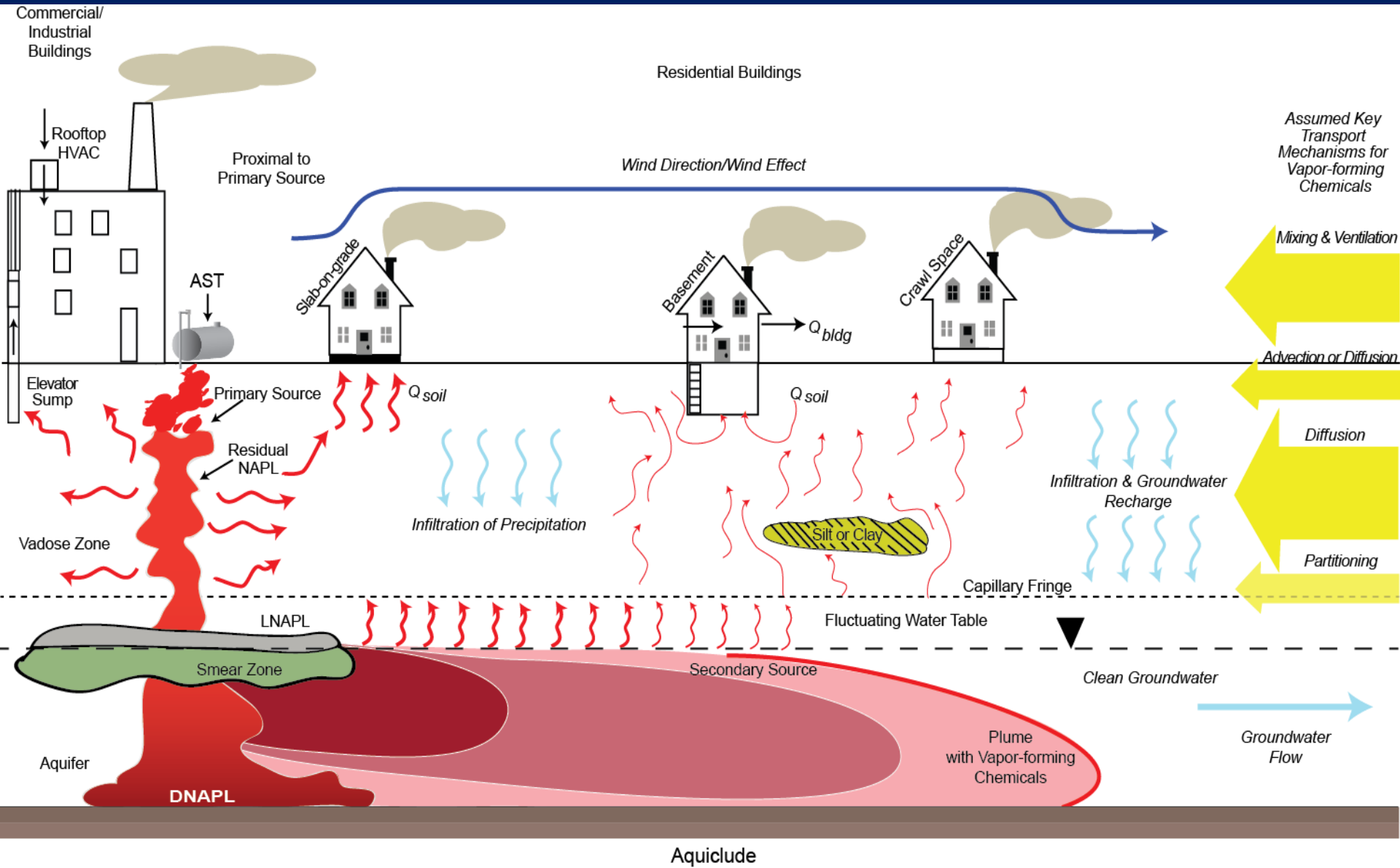
FIGURE 4-9

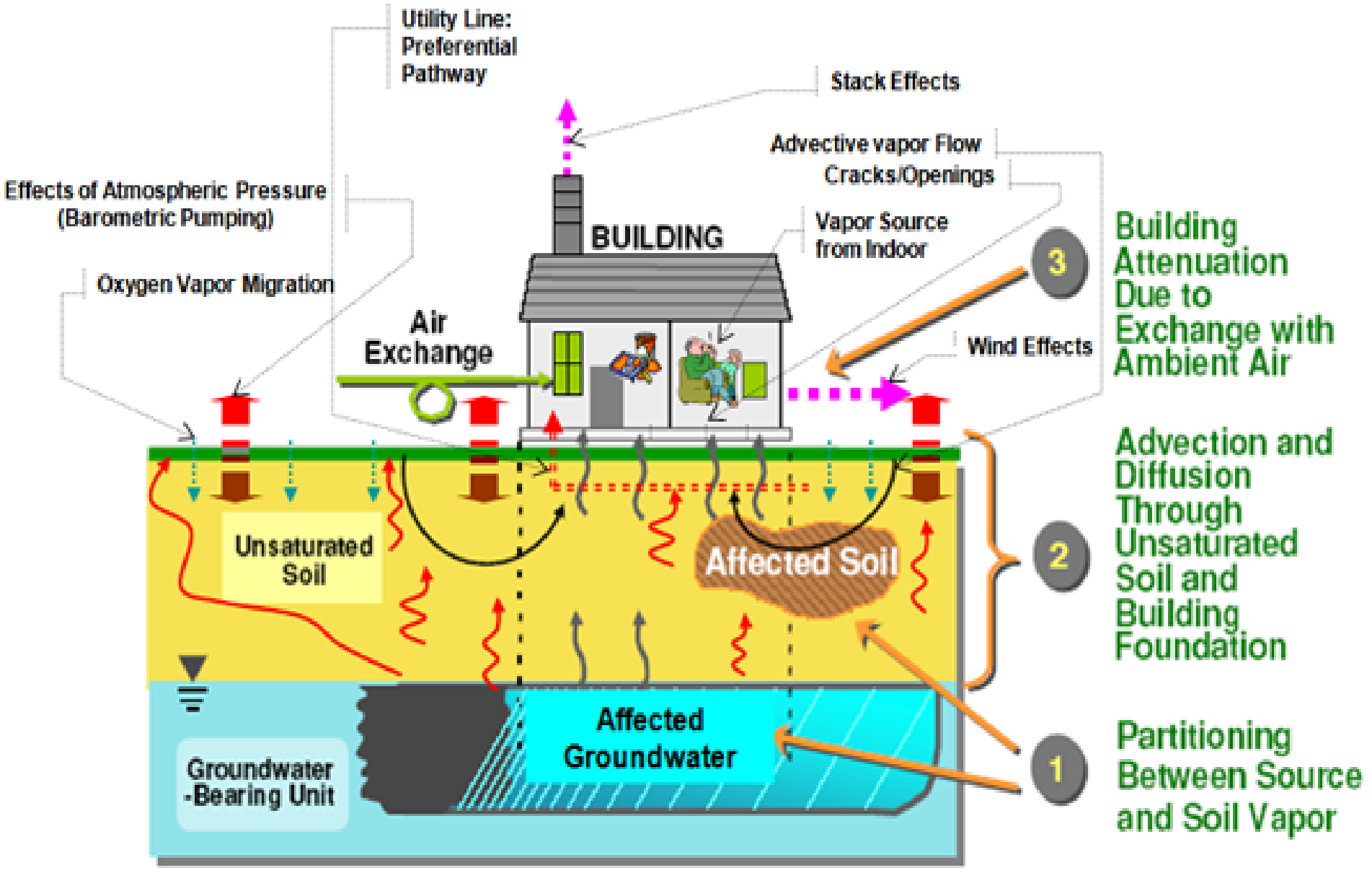
Prepared for:
U.S. EPA. REGION V
Contract No: EP-S5-06-04
TDD NO: S05-0008-0803-001
DCN: 394-2A-ABSD

Prepared by:
WESTON SOLUTIONS, INC.
750 East Bunker Court
Vernon Hills, IL

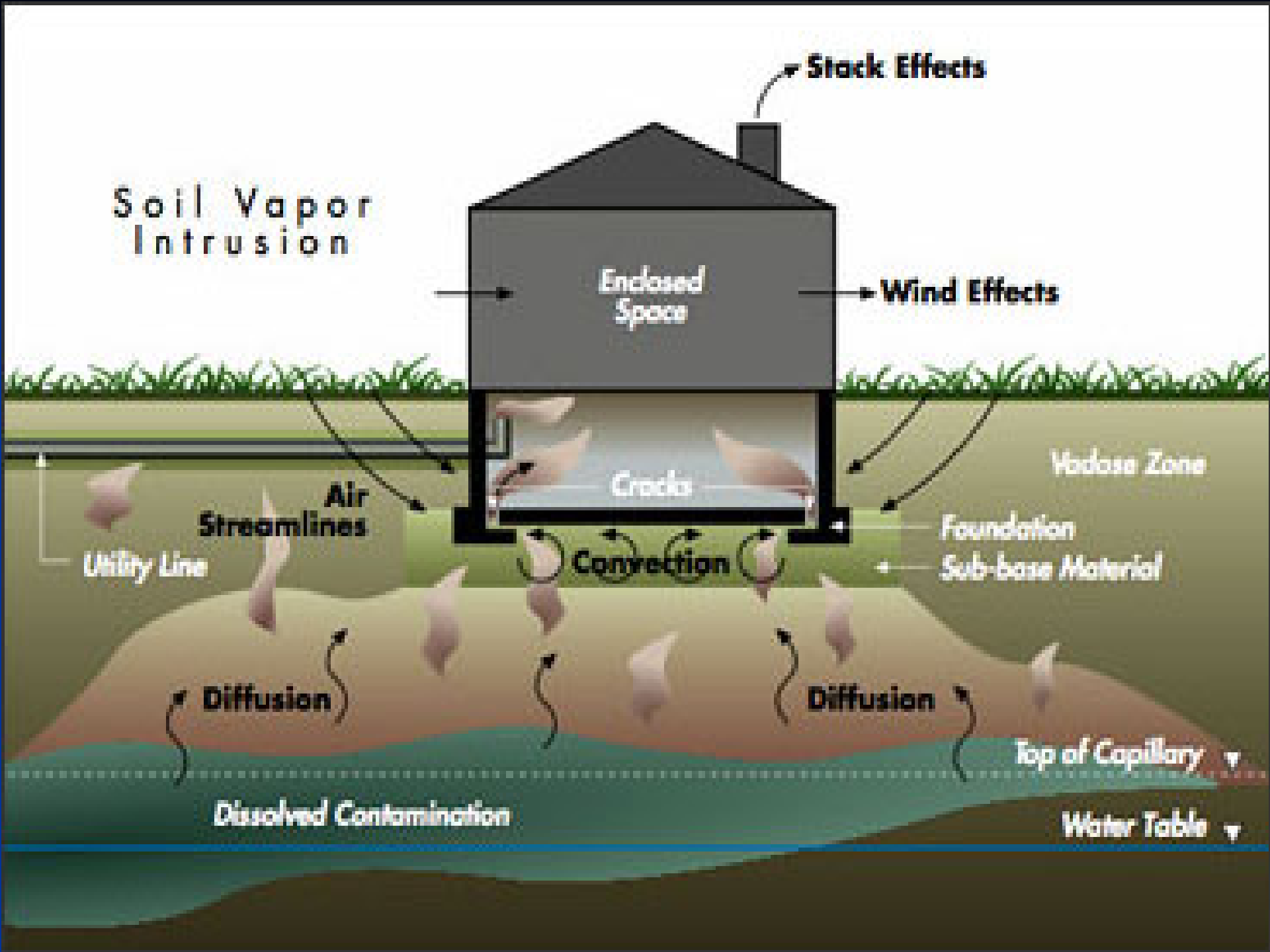
Extent of Vinyl Chloride Contamination in Deep Aquifer 2006
Copley Square Plaza
Copley, Ohio
April 22, 2008

2012-More Complex & Variable





Typical Example of Vapor Intrusion Pathway


Soil Vapor Intrusion
Stack Effects
Enclosed Space
Wind Effects
Vadose Zone
Cracks
Air Streamlines
Foundation
Sub-base Material
Utility Line
Convection
Diffusion
Diffusion
Top of Capillary
Dissolved Contamination
Water Table

What is Required For VI

- Source of Vapors
- Pathway To Building
- Entry Routes
- Driving Forces
  - Advection- pressure gradients
  - Diffusion- molecular flow from high to low concentration

Vapor-Forming Chemicals

- Chlorinated VOCs (CVC)
- Petroleum Hydrocarbons (PHCs)
- Mercury
- Radon (from uranium/radium SW)
- Methane from Landfills, pipelines and degrading PHCs
- PCBs

What is a Source?

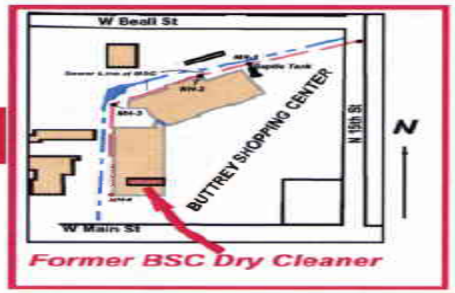
- Presence of Contamination
  - Soil Gas
  - NAPLs in unsaturated soil or top of water table
  - Dissolved Contaminants in Groundwater
- Sufficient Volatility and Toxicity
- Volatilize under NORMAL temperature and pressures

Common Vapor Intrusion Sources

- Primary Vapor Sources
  - USTs
  - Sewers (cracks, joints, breaks) and septics
  - Pipelines
  - Former and Current Landfills
  - HWMUs/SWMUs
- Secondary Sources
  - Contaminated Groundwater
  - Sanitary Sewers

Primary Source

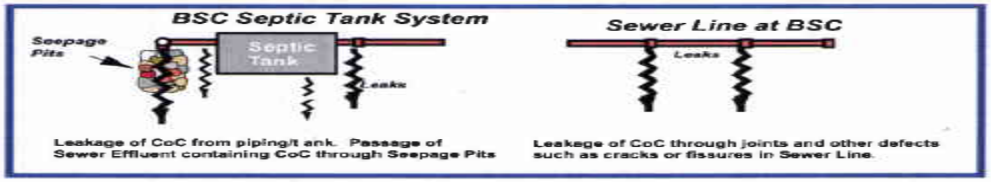
Primary Source of Contamination



Other Sources of Contamination

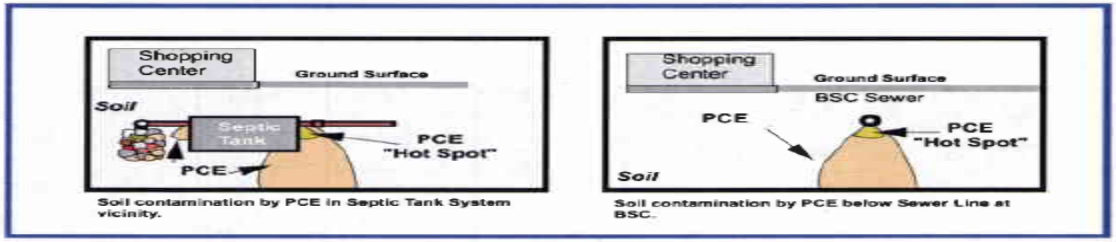
Potential Other Sources may occur at any business connected to Sewer Line which dispenses chemicals of concern (CoC) to the sewer line.

Infrastructure Losses

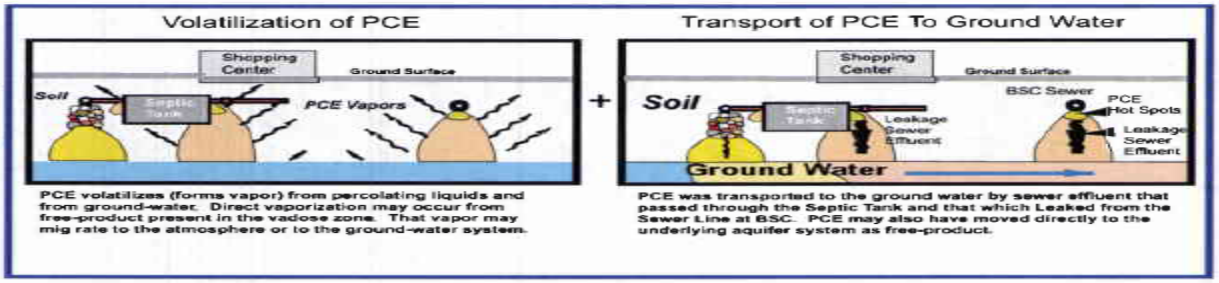


Secondary Sources

Soil Contamination



Transport to Air/ Ground Water



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Bozeman Solvent Site

From: NE & W, 1999b

NICKLIN EARTH & WATER, INC.

Primary and Secondary Sources of Contamination at Buttrey Shopping Center

Figure 5

Principal Transport Mechanisms

- **Diffusion**- flow from high concentrations (source) to low concentration (surrounding area)
- **Advection**- Bulk movement caused by pressure gradients
- **Phase Partitioning-** transport from one media to another

Numerous Factors Affect Transport Mechanisms

- Source Concentration
- Source Depth and Lateral Distance
- Subsurface Conditions
- Building Design and Operation
- Wind and Barometric Pressure

Source Concentrations

- Higher source concentrations tend to lead to higher soil gas and indoor air concentrations
- Higher concentrations under slab than at similar depths away from building

Source Location

- For Shallowest sources (<10 feet)
  - soil gas is 90% of source concentration for basement
  - Soil gas 30%-80% for slab-on-grade
- Deep Sources (>36 feet), soil gas:
  - Foundation scenario is 20%-30% of source
  - Slab-on-grade 10%-20% of source
- Indoor air concentrations more influenced by lateral distance than foundation (e.g., concentrations for shallow sources decrease faster with lateral depth than for deeper sources)

Variable Source Characteristics

- Transport primarily upward when source:
  - At water table
  - Ground surface uncovered
- Transport For Deep Groundwater
  - Lateral Transport More Significant thanVertical
  - Long and narrow
  - May travel over mile
- Soil Gas
  - May extend in lateral directions
  - May be larger than groundwater plume

Influence of Building Conditions

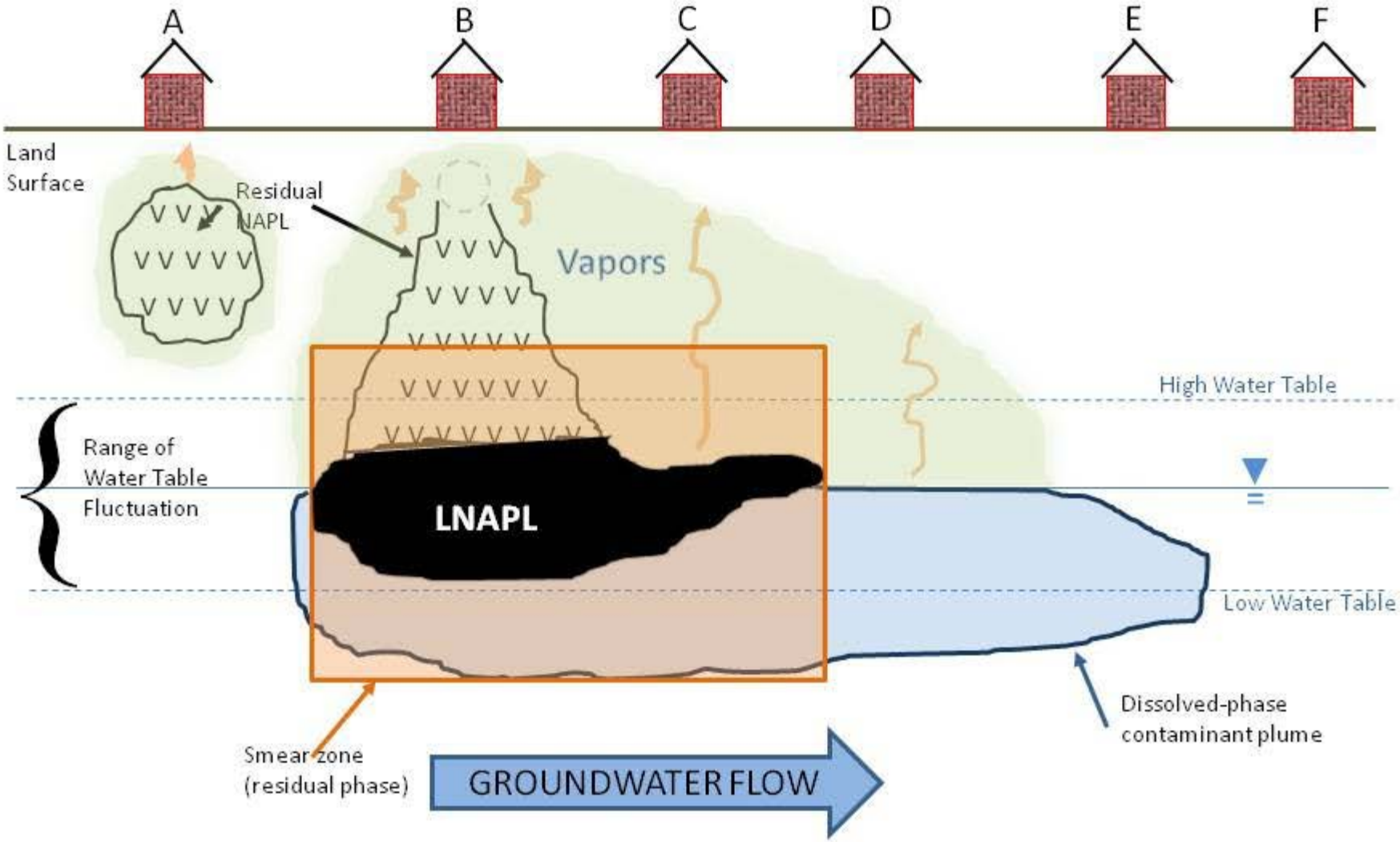
- Openings or Cracks in Foundation
- Building Pressurization-
  - Temperature Differences (Stack Effect)
  - Ventilation (Air Exchange Rate and Air Flow Rate)
  - Exhausting air may depressurize building
  - Increasing more outside air may over-pressurize bldg
- Crawl Spaces
  - Good dilution but does not impede flux

Building Influences

- Perimeter cracks (influences advection)
- Fractures or porous areas in concrete floor due to improper curing
- Conduit penetrations (sewer, water, electrical, floor drains)
- Mobil Homes
- Parking Garages

Subsurface Factors

- Soil Moisture
- Organic Material
- Soil Permeability
- Layering
- Fresh Water Lens
- Ground Cover
- Fluctuating Water Table


A
B
C
D
E
F
Land Surface
Residual NAPL
Vapors
High Water Table
Range of Water Table Fluctuation
LNAPL
Low Water Table
Dissolved-phase contaminant plume
Smear zone (residual phase)
GROUNDWATER FLOW

2012 EPA VI Initiatives

- Final Guidance For Assessing And Mitigating The Vapor Intrusion Pathway From Subsurface Sources To Indoor Air (CVI Guidance)
- Guidance For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites (PVI Guidance)
- Addition of Subsurface Intrusion (SsI) to the HRS

CVI Guidance

- Moves Away from Tiering Approach
  - Preliminary Assessment
  - Pre-emptive Mitigation?
  - Detailed Investigation
- Emphasizes
  - Empirical Data Rather Than Screening with model
  - Multiple lines of evidence
  - Collection of soil gas near source with less emphasis on data distal to source
  - Soil matrix samples to delineate source
- Lots of Recommendations

CVI Guidance Applicability

- RCRA Corrective Action
  - EI (Current Human Exposure Under Control)
  - RFI/CA
- CERCLA
  - Removal and Remedial Actions
  - Five Year Reviews (FYRs)
  - NPL Scoring
  - Federal Facilities
  - Brownfield Development

Applies to ALL Building Uses

- Residential
  - Single-family, mobile homes, multi-family
- Non-Residential
  - Schools, libraries, hospitals
- Commercial
  - Hotels, office, retail ,warehouses
- Industrial

Non-Residential Considerations For Determining if Sampling Warranted

- Contact Owners/Tenants For Site-Specific Info
  - Occupants (workers, visitors, customers, suppliers)
  - Chemicals used
  - Training, engineering controls
- Building Design
- Occupant Characteristics (general public, sensitive population, EJ)
- Background Chemicals
- ECs/workpractices in place?
- Document Reasons For No Further Action
- Request Notice of Significant Changes (e.g, building ownership, use, public access, renovation/construction)

Preliminary Assessment

- Assembling Information about building
  - History of operations and chemicals used
  - Odor or health complaints
  - Wet basements
  - Locations and history of nearby buildings for redevelopment
  - Current and reasonably anticipated future land use
  - Location of utilities
  - Identify Data Gaps
- CSM

Identify Conditions Requiring Prompt Action

- Explosive Conditions
  - Vapors in conduits, sumps or other subsurface drains exceed 10% of LEL
  - EPA recommends evacuation
- Health Concerns
  - Vapor concentrations exceed chronic or acute toxity values
  - EPA recommends ventilation, indoor air treatment or evacuation

CSM

- Understand site-specific conditions including:
  - Nature of contamination, location and spatial extent
  - Location, use and construction of local buildings
  - Surface Settings (hydrogeologic and geologic)
  - Suspected preferential pathways
  - Potentially exposed populations (children, women of child-bearing age, elderly, chronic ill and EJ)
  - Potential exposure routes (not limited to inhalation)
- Evaluate Data Quality
- Preliminary Screening

Detailed Investigation

- Collect and Evaluate Multiple Lines of Evidence to Characterize Vapor Pathway
- Modeling not recommended as only line of evidence
- Identify Indoor Air Screening Tools
- Develop Vapor "Inclusion" Zone
- Characterize Nature and Extent of Vapor Sources

Risk Management Decisions

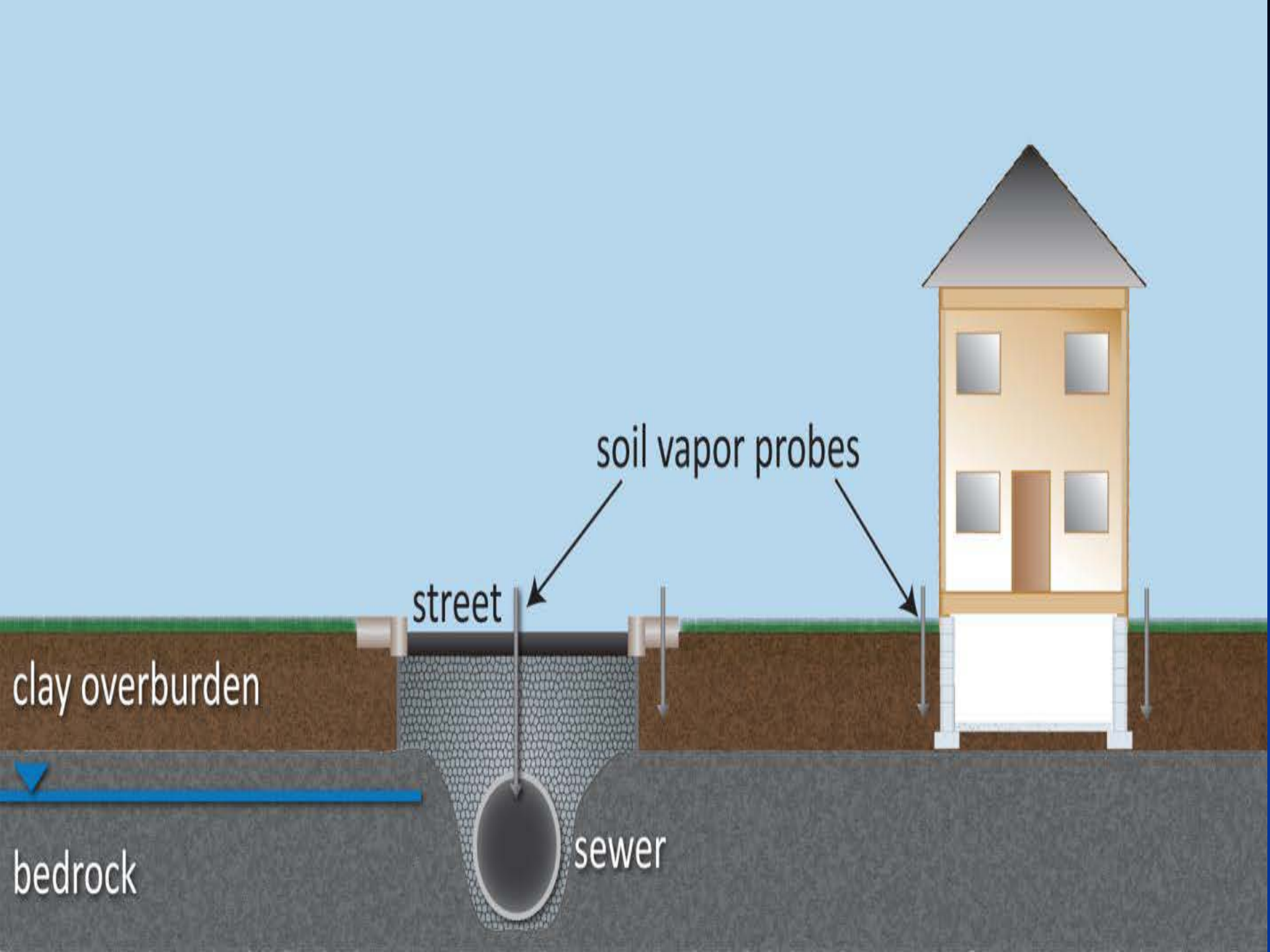
- More than one round of sampling and several may be required to understand temporal and spatial variability of indoor air concentrations
- Ensure past vapor intrusion decisions supported by current conditions
- If lines of evidence not agree or weight of evidence does not support confident decision, additional sampling or lines of evidence may be necessary
- Considerable scientific judgment may be required to evaluate lines of evidence and decide if pathway complete
- Recommends human health assessment

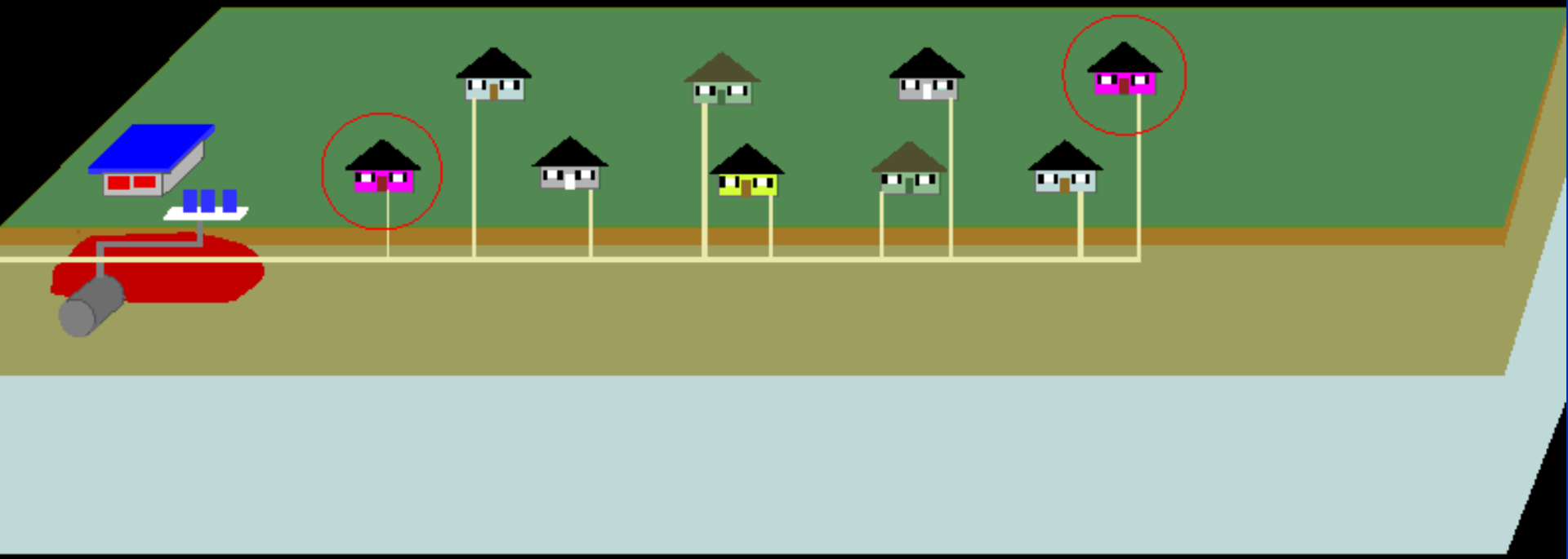
Screening Distances

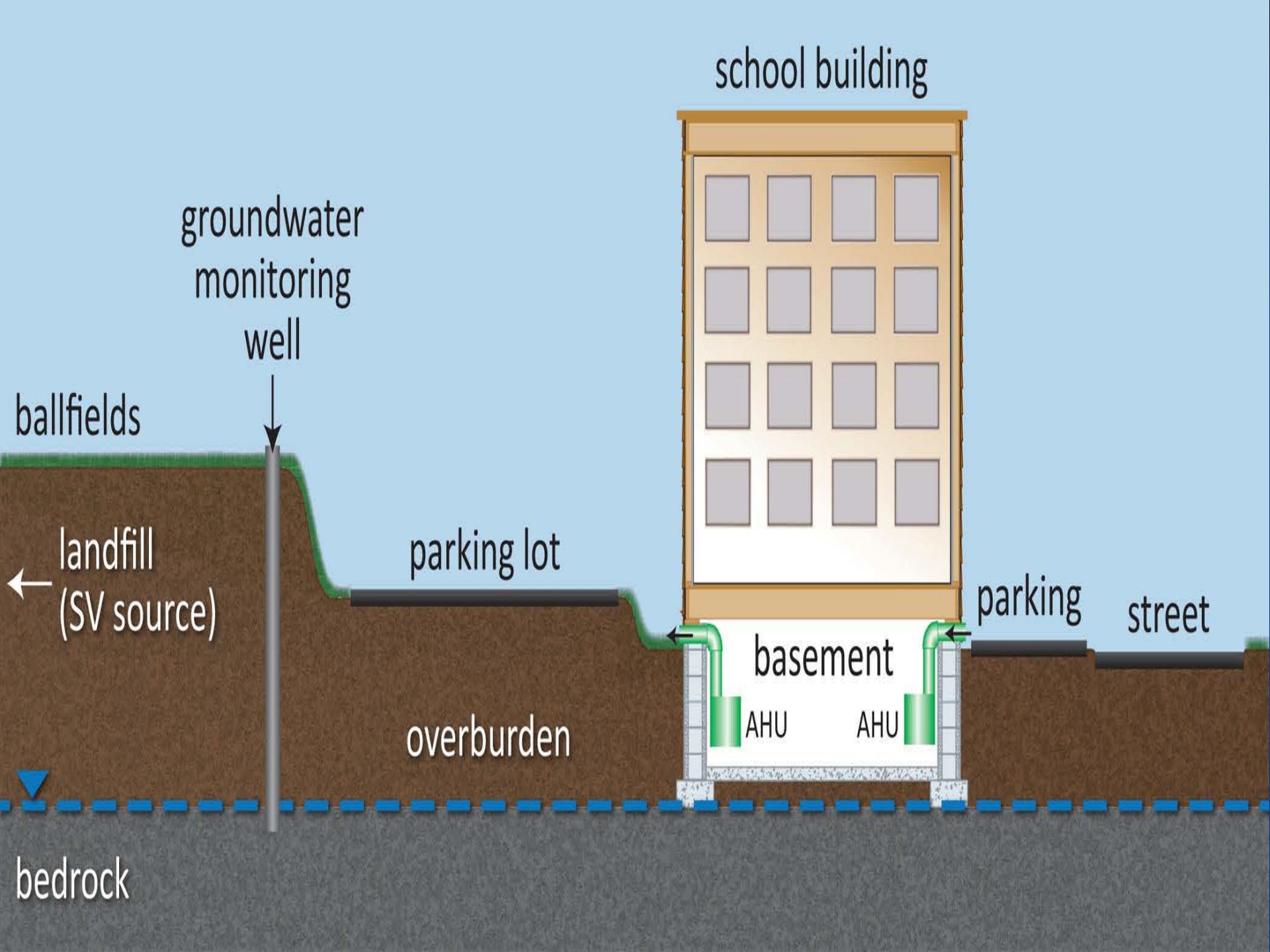
- Generally 100 Feet laterally or vertically from boundary of source
- Modify for site-specific inclusion zones
- Beware of Preferential Pathways (Conduits, sewers, hydrogeologic features) that facilitate migration of unattenuated vapors

Investigate

Preferential Pathways


soil vapor probes
street
clay overburden
bedrock
sewer




school building
groundwater monitoring well
ballfields
landfill (SV source)
parking lot
parking
street
basement
AHU
AHU
overburden
bedrock

VISL Calculator

- Identifies Chemicals Prone to Vapors
- Recommended Screening Level Concentrations
- Calculator for Site-Specific Screening Levels
  - User-defined target risk levels
  - Exposure scenarios
  - Medium specific
  - Semi-specific attenuation Factor

Empirical Attenuation Factors

- Based on Database
- 95 Percentile
- Apply Source Strength and Indoor Air Screens to eliminate "background" interference
- Soil Gas AF (50x Bkgd)
  - Residences (basements) 3E-02 (0.03)
  - Residences (slab) 1E-01 (0.01)

Attenuation Factors Cont'd.

- Groundwater AF (1000x bgkd)
  - Fine Soil 5E-04 (0.0005)
  - Coarse Soil 1E-03 (0.001)
  - Very Coarse Soil 4E-03 (0.004)
  - Depth to GW <1.5m 7E-03 (0.007)
  - Depth to GW 1.5-3m 2E-03 (0.002)
  - Depth to GW 3-5m 2E-03 (0.002)
  - Dept to GW> 5m 6E-04 (0.0006)

AF

- Exterior Soil Gas AF (50 x Bkgd)
  - All residences 3E-01 (0.3)
- Crawlspace AF (indoor air screen)
  - All residences 9E-01 (0.9)

Mitigation

- Temporary Measures
  - Increasing ventilation, sealing entry routes and treating indoor air
- Engineering Controls
  - Active Depressurization Technology (ADT) preferred for Existing Buildings
  - More options for New Buildings

Mitigation O&M

- O&M Plan Manual
  - Routine Inspections
  - Pressure Measurements
  - Air Sampling
  - Alarms
- Provide User Guide to owners and operators

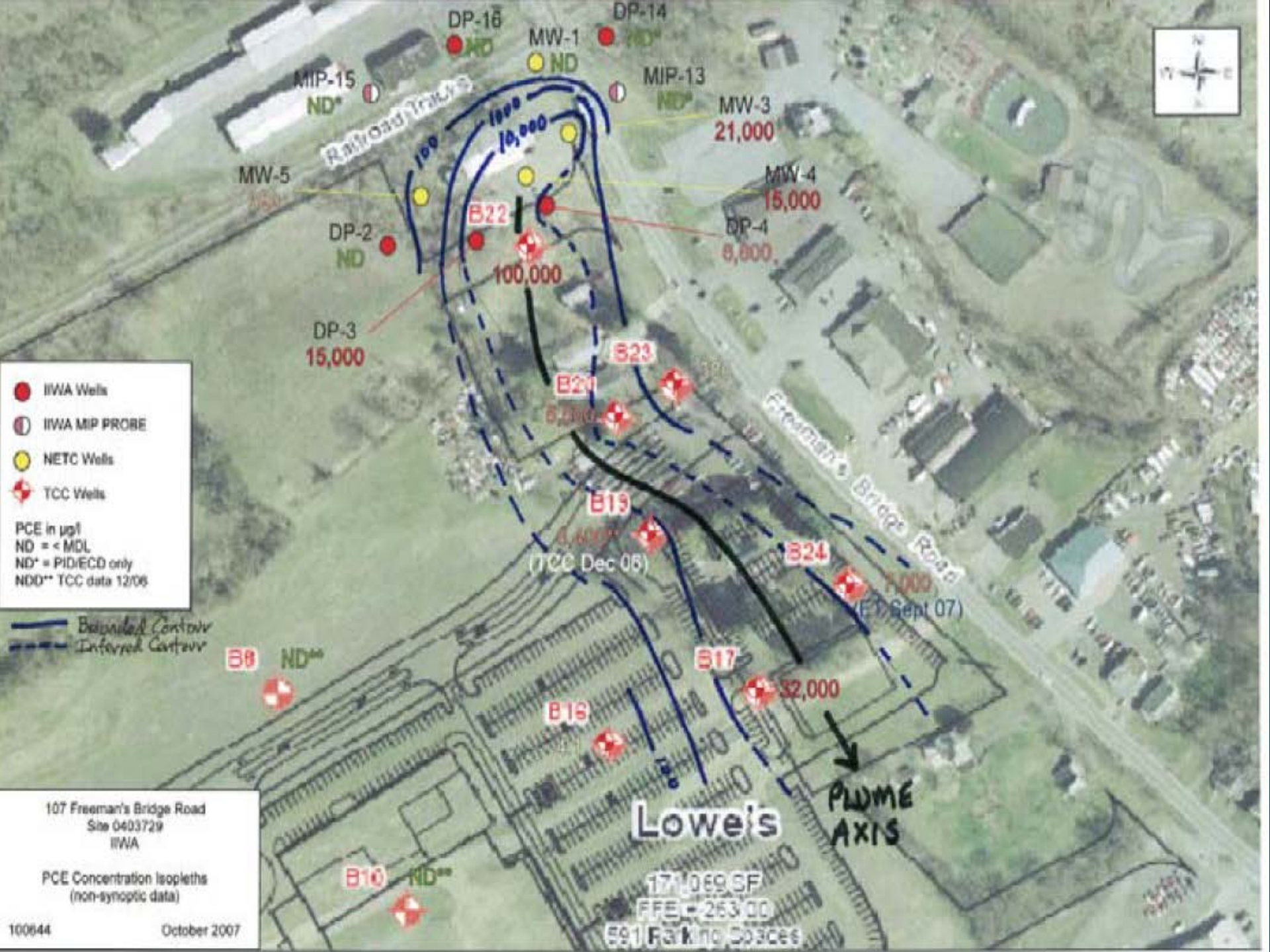
Institutional Controls

- Recommends Use of Institutional Controls Implementation and Assurance Plan (ICIAP)
- Current or Future Use
- Termination/Exit Strategy
  - Identify termination criteria
  - Cleanup levels for source areas for all media
  - Attainment period when mitigation system turned off
  - Site-specific monitoring data for passive mitigation systems

Institutional Controls for Future Use?

Railroad Tracks
N
W
E
S


N
WATER SOURCE
SAMPLE DATE 12-22-08
CIS-1,2-DCE BMDL
TCE BMDL
PCE BMDL
PIPE INLET
SAMPLE DATE 12-22-08
CIS-1,2-DCE 25 ug/L
TCE 18 ug/L
PCE 150 ug/L
DP-4D
DP-4S
B22
PIPE BREAK
SAMPLE DATE 12-22-08
CIS-1,2-DCE 68 ug/L
TCE 57 ug/L
PCE 840 ug/L
PIPE OUTLET
SAMPLE DATE 12-22-08
CIS-1,2-DCE 88 ug/L
TCE 50 ug/L
PCE 790 ug/L
CONSTRUCTION OUTLET
SAMPLE DATE 12-22-08
CIS-1,2-DCE BMDL
TCE BMDL
PCE 89 ug/L


DP-16
ND
DP-14
ND*
MW-1
ND
MIP-15
ND*
MIP-13
ND*
MW-3
21,000
Railroad Tracks
100
1000
10,000
MW-5
MW-4
15,000
B22
DP-2
ND
100,000
DP-4
6,000
DP-3
15,000
B23
B21
B19
(TCC Dec 06)
Freeman's Bridge Road
B24
(TCC Sept 07)
B8
ND**
B17
32,000
B16
PLUME AXIS
Lowe's
B10
ND**
IIWA Wells
IIWA MIP PROBE
NETC Wells
TCC Wells
PCE in µg/l
ND = < MDL
ND* = PID/ECD only
NDD** TCC data 12/06
Delineated Contour
Inferred Contour
107 Freeman's Bridge Road
Site 0403729
IIWA
PCE Concentration Isopleths
(non-synoptic data)
100644
October 2007

Pre-emptive Mitigation (PEM)

- Prevent or Reduce Vapors Into Building
- Reduce or Eliminate Vapors in Building
- Form of CERCLA "Early Action" or RCRA Interim Action and Site Stabilization
- Most suitable for:
  - Shallow acquifer
  - High-Permeable Soils
  - Preferential Pathways (conduits, bedrock fractures)

Petroleum VI (PVI)

- Guidance For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites
- Technical Support Document
  - Petroleum Hydrocarbons And Chlorinated Hydrocarbons Differ In Their Potential For Vapor Intrusion (March 2012)
  - EPA's Petroleum Vapor Intrusion Efforts Q/A (May 2011)

Petroleum VI Guidance

- RCRA Subtitle "I" USTs
- Excluded: Petroleum Releases from Petroleum Bulk Storage Terminals, Refineries, ASTs and Pipelines
- LUSTF may not be used to assess or cleanup non-UST or non-PHC contaminants (MTBE, TBA, TEL, TML, EDB, DCA)

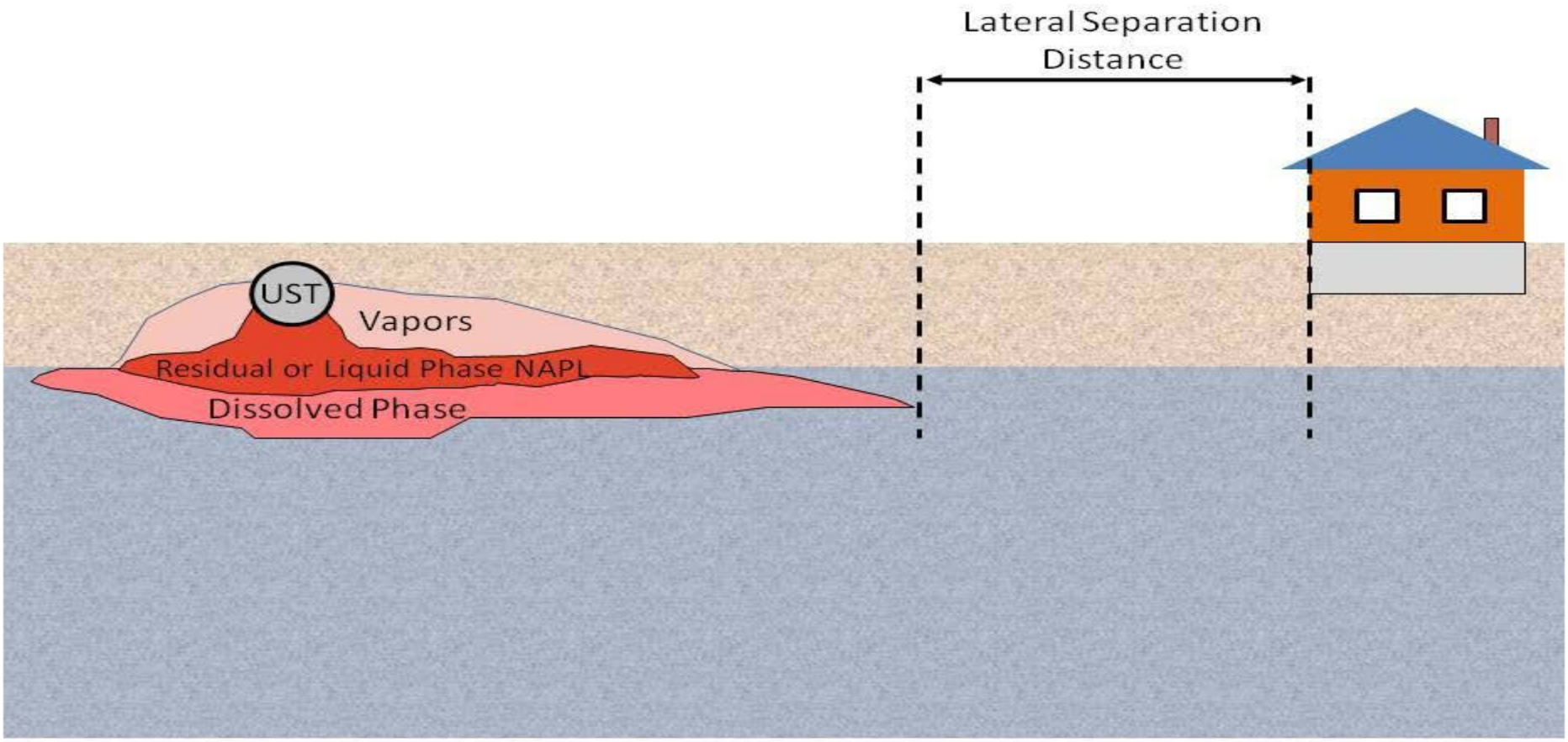
Recommended Approach

- Assess and Mitigate Immediate Threats
- Conduct Site Characterization
- Develop Conceptual Site Model (CSM)
- Delineate Lateral Inclusion Zone
- Identify Preferential Transport Pathways
- Determine Vertical Separation Distance For Each Building within Inclusion Zone
- Mitigate As Appropriate

Lateral Inclusion Zone

- Area surrounding contaminant mass where petroleum vapors may migrate.
- Properties outside zone may be excluded unless:
  - Preferential transport
  - Extensive Impermeable Cover Impeding Biodegradation
  - Inhospitable soil conditions (e.g., dry soils, high organic content)

PVI-Lateral Distance



Vertical Separation Distance

- Thickness of "clean", biologically active soil
  - 95% attenuation of benzene vapors below thresholds of concern
- Measured from lowest point of the overlying building (foundation, basement or slab) and historic water table
- Based On Site-Specific Observations On Effectiveness of Biodegradation
- No "generic" vertical separation distance

No Further Investigation

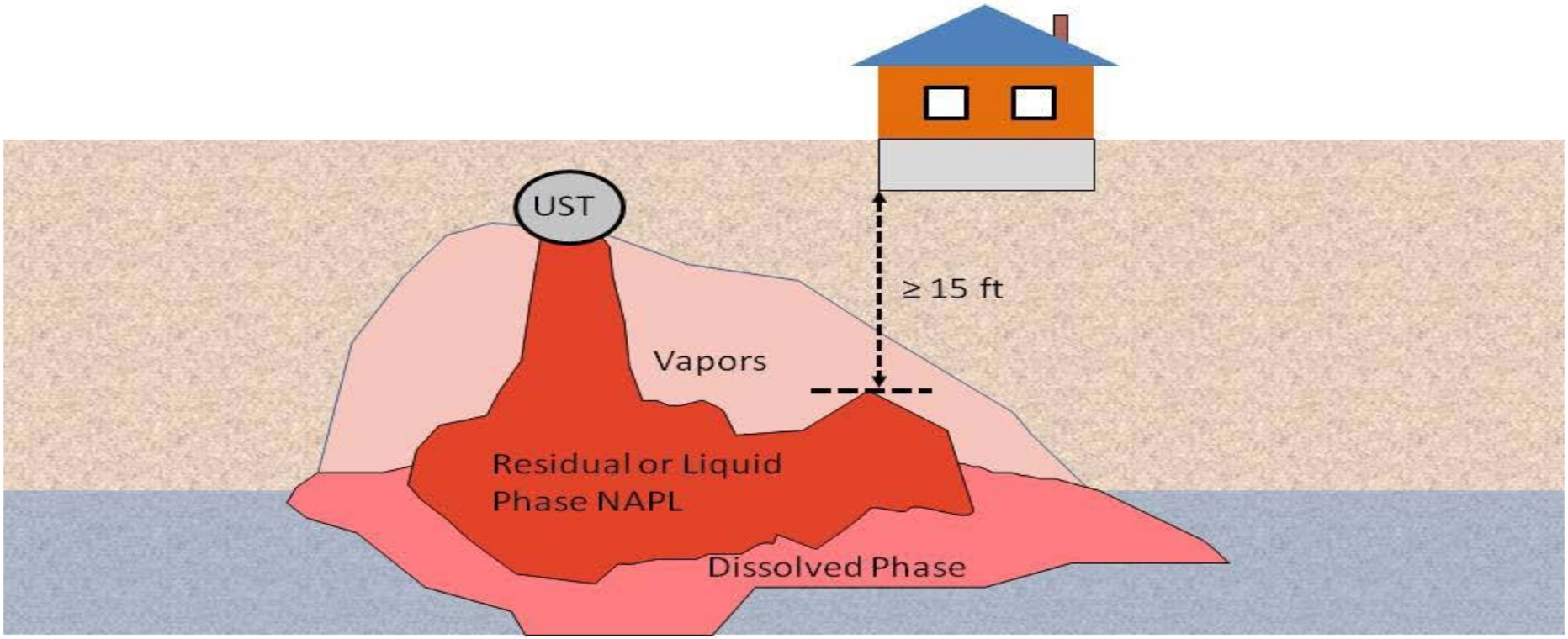
- Vertical Separation Distance 6 or more feet
  - GW has no more 5 mg/l Benzene or 30 mg/l TPH (gasoline); or
  - Soil contamination no more 250 mg/kg TPH (gasoline) or 10 mg/kg Benzene
  - These are indirect LNAPL thresholds

- Vertical Separation 15 or more feet
  - GW has > 5 mg/l benzene) or 30 mg/l (TPH), or
  - Soil is > 10 mg/kg benzene or 250 mg/kg TPH

Sampling Recommendations

- Sub-Slab
  - Dissolved GW w/i 6 ft
  - LNAPL w/i 15
- Exterior Soil Gas and bulk soil sampling
  - LNAPL w/i 15 to 30 ft

PVI-Vertical Distance



Impact on Due Diligence

- Revisions to ASTM E1527
- Viability of E2600

VI IS DILIGENCE GAME CHANGER

- Historic Uses
- Urban "Rogue" Plumes
- Old/ RBCA Cleanups (Dry Cleaner Funds)
- Off-site Sources
- School and Day Care Facilities
- Varying State Standards
- Complex Pathway
- Often the Only Completed Pathway

OFF-SITE MIGRATION

- Driving Listing and Re-opener Decisions
- Leading Cause of Litigation

VAPOR INTRUSION LIABILITY

- CERCLA (Removal Actions, UAOs, RI, RD/RA, 5-YR Reviews, HRS?)
- RCRA Corrective Action (EI/HE)
- UST
- State Remedial Programs
- Common Law
- Disclosure Laws

CERCLA and VI

- EPA considering incorporating VI into HRS
  - HRS weighted to drinking water
  - New pathway or incorporate into groundwater or air pathways
- Impact on Listing Decisions?

CERCLA and VI

- Exclusion from Releases:
  - Exposures to persons solely in workplace
  - for claims asserted against employer (workers compensation?)
- 1993 Contaminated Building Guidance
- 1986 Methane Guidance

OSHA

- 2002 Guidance-PELs not applicable for indoor air contaminated by releases from the environment
- Regions ask for further clarification b/c PELs used at RCRA sites for Human Exposures Under Control EI
- OSHA Reportedly Conceded in 2004 That No Authority to Preclude EPA from Taking Action Under CERCLA

CERCLA Continued

- Third Party Defense
  - Due Care Element
  - Precautionary Element
- ILO, BFPP and CPO
  - appropriate care (Pre-emptive Mitigation?)

RCRA

- Corrective Action 3004 (u) and (v)
- Closure (TSDF and Generator)
- Section 3013 AO
- Section 7002
- Section 7003
- Section 3008(h)
- Sub-title I (USTs)

RCRA 7002

- Perhaps More Important Than CERCLA
- Low Pleading Threshold
  - May be "contributing to"
  - May be creating "Imminent and Substantial Endangerment
- Injunctive Relief
- Attorney Fees

Primary Jurisdiction

- Asserted in cases with outgoing cleanups
- Most courts are rejecting use with common law claims
- Mixed results in RCRA 7002

Common Law

- Negligence
- Trespass
- Nuisance
- Strict Liability
- Negligent Misrepresentation
- Malpractice
- State Disclosure

Notable 2012 Litigation

- Ivory v International Bus. Machines Corp, 2012 N.Y. Misc. LEXIS 5229 (Sup. Ct.-Broome Cty 11/15012)
- Forest Park Nat'l Bank & Trust v. Ditchfield, 2012 U.S. Dist. LEXIS 103007 (N.D.Ill. 7/24/12)
- Sisters of Notre Dame De Namur v. Mrs. Owen J. Garnett-Murray, 2012 U.S. Dist. LEXIS 78747 (N.D. Cal. 6/6/12),

2012 Litigation Cont'd.

- Doris Alexander v Exxon Mobil, No. BC435640, Super. Ct-Los Angeles cty 06/06/2012)
- Voggenthaler v. Md. Square LLC, 2012 U.S. Dist. LEXIS 69395 (D.Nv. 5/17/12)
- Leese v. Lockheed Martin, 2012 U.S. Dist. LEXIS 50963 (D.N.J. 4/11/2012)
- Grace Christian Fellowship v. KJG Invs., Inc., 2012 U.S. Dist. LEXIS 43421 (E.D. Wisc. 3/29/12)
- Tilot Oil, LLC v. BP Prods. N. Am., Inc, 2012 U.S. Dist. LEXIS 5365 (E.D.Wisc. 1/17/12)

Other Notable Litigation

- Voggenthaler v Maryland Square LLC (D.NV 7/10)
- Stoll v Kraft (S.D.Ind. 6/10)
- U.S. v. Apex (7th Cir 8/25/09)
- West Coast Home Builders v. Aventis Cropscience; SPPI-Sommersville v TRC Cos. (N.D. Ca. 8/21/09)

Notable Litigation

- Rochester Technology Park (NY VCA)
- Moutenot v DuPont (NJ-Passaic Cty)
- Spear v. Chrysler LLC; First Property Group, Ltd v. Behr Dayton Thermal Products LLC; Martin v. Behr Dayton Thermal Products LLC
- Sher v. Raytheon
- Sunrise Harbor Realty, LLC v 35th Sunrise Corp, 2011 N.Y. App. Div. LEXIS 5834 (App. Div-2nd Dept 7/11)

Statute of Limitations

- *Aiken, et al. v. General Electric Co (*2008 N.Y. App. Div. LEXIS 9212*)*
  - *20-year old groundwater plume*
  - *SOL not preclude claim because VI pathway not known*
- *Role of newspapers, public meetings for determining when person should have reasonably known of potential exposure*
- *Federal Commencement Date*

Disclosure

- NY Adopted Vapor Intrusion Notification Law
- Common Law Disclosure Obligations
  - Misrepresentation
  - Fraud
  - Negligent Non-Disclosure

Environmental Quality Review Litigation

- Citizens for Upholding Zoning Regs v. City of Palo Alto, 2012 Cal. App. Unpub. LEXIS 4246 (6th app. Dist. 6/1/12)
- Bronx Committee for Toxic Free Schools v. NYSCA, 2012 N.Y. LEXIS 2742 (10/23/2012)

Useful EPA Websites

- EPA Vapor Intrusion webpage: http://www.epa.gov/oswer/vaporintrusion
- EPA Vapor Intrusion and the Superfund Program (HRS Website): http://www.epa.gov/superfund/sites/npl/hrsaddition.htm
- EPA Technical Documents and Tools Prepared to Support Guidance Development: http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item7
- EPA Clean-up Information website for Vapor Intrusion: http://www.clu-in.org/issues/default.focus/sec/Vapor_Intrusion/cat/Overview/
- EPA OUST Petroleum Vapor Intrusion (PVI) Webpage: http://www.epa.gov/oust/cat/pvi/index.htm