RISK BASED CLOSURE ALTERNATIVE TO REMEDIATION AT AN URBAN SITE

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January 17, 2011

OVERVIEW

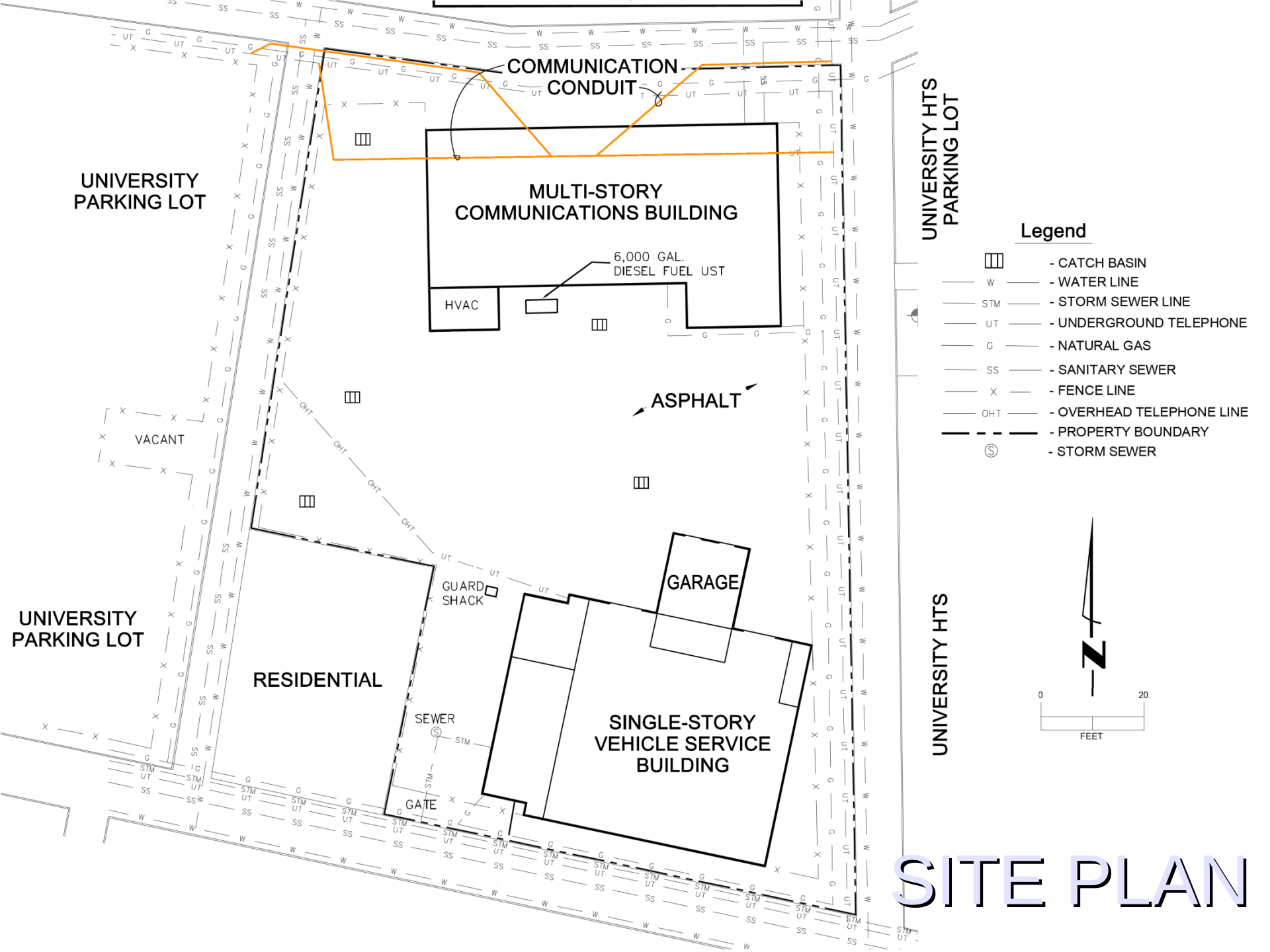
- This presentation will illustrate the use of the Ohio Voluntary Action Program (OVAP) to mitigate environmental impact on an active urban site.
- In this example, the solution focuses on the use of risk-based criteria and program elements unique to OVAP.
- Following Phase II activities, the Volunteer chose to leave an existing chlorinated VOC source in soil and groundwater in place, rather than remediate or remove this source.

OVERVIEW (cont)

- This decision based on unique site setting and Volunteer metrics and preferences (cost and timelines).
- The solution also relies on elements available through the OVAP program.

Facility Status and Setting

- Communication Utility since 1935
  - Active operations continue
    - Vehicle Maintenance Center
    - Communications Center
    - Critical telecommunication support services to Cleveland area.
- Located in Urban Setting
  - Light commercial, educational & residential setting
  - Adjacent to major college
  - High level of pedestrian traffic


COMMUNICATION CONDUIT
UNIVERSITY PARKING LOT
MULTI-STORY COMMUNICATIONS BUILDING
6,000 GAL. DIESEL FUEL UST
HVAC
UNIVERSITY HTS PARKING LOT
ASPHALT
VACANT
GUARD SHACK
GARAGE
UNIVERSITY PARKING LOT
RESIDENTIAL
SEWER
SINGLE-STORY VEHICLE SERVICE BUILDING
GATE
UNIVERSITY HTS
Legend
- CATCH BASIN
W - WATER LINE
STM - STORM SEWER LINE
UT - UNDERGROUND TELEPHONE
G - NATURAL GAS
SS - SANITARY SEWER
X - FENCE LINE
OHT - OVERHEAD TELEPHONE LINE
- PROPERTY BOUNDARY
S - STORM SEWER
N
0
20
FEET

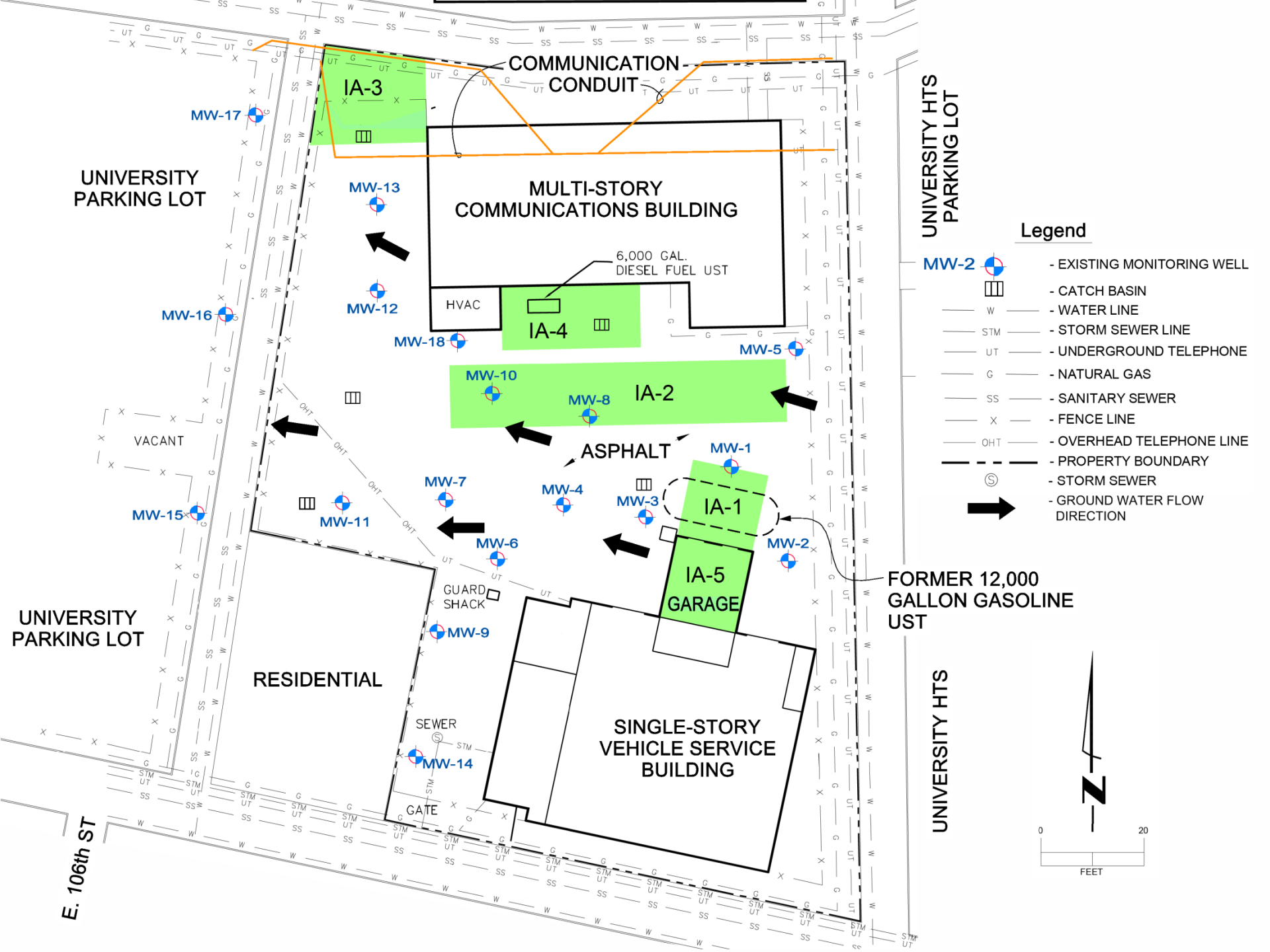
SITE PLAN

Client Requirements

- **Corporate Office Metrics**
  - Timeliness/Progress
  - Cost
- **Local Office**
  - Future site use same as current
  - Ownership into foreseeable future
  - Minimize impact of activities to operations
  - Protective of Union workforce

Previous Investigations

- Eight investigation / remediation events - 1993-2006
  - Gasoline and diesel USTs
  - No closure for source areas
- Groundwater impacted by CVOCs and BTEX
    - Onsite and Offsite impacts exceed USEPA MCLs - up to 20mg/L CVOC onsite
- 2006 OVAP Phase I draft


COMMUNICATION CONDUIT
IA-3
MW-17
UNIVERSITY PARKING LOT
MW-13
MULTI-STORY COMMUNICATIONS BUILDING
6,000 GAL. DIESEL FUEL UST
HVAC
IA-4
MW-12
MW-16
MW-18
MW-5
MW-10
MW-8
IA-2
VACANT
ASPHALT
MW-1
MW-7
MW-4
MW-3
IA-1
MW-15
MW-11
MW-6
MW-2
IA-5
GARAGE
GUARD SHACK
MW-9
UNIVERSITY PARKING LOT
RESIDENTIAL
SEWER
MW-14
GATE
SINGLE-STORY VEHICLE SERVICE BUILDING
E. 106th ST
UNIVERSITY HTS PARKING LOT
UNIVERSITY HTS
FORMER 12,000 GALLON GASOLINE UST
Legend
MW-2 - EXISTING MONITORING WELL
- CATCH BASIN
W - WATER LINE
STM - STORM SEWER LINE
UT - UNDERGROUND TELEPHONE
G - NATURAL GAS
SS - SANITARY SEWER
X - FENCE LINE
OHT - OVERHEAD TELEPHONE LINE
- PROPERTY BOUNDARY
S - STORM SEWER
- GROUND WATER FLOW DIRECTION
N
0
20
FEET

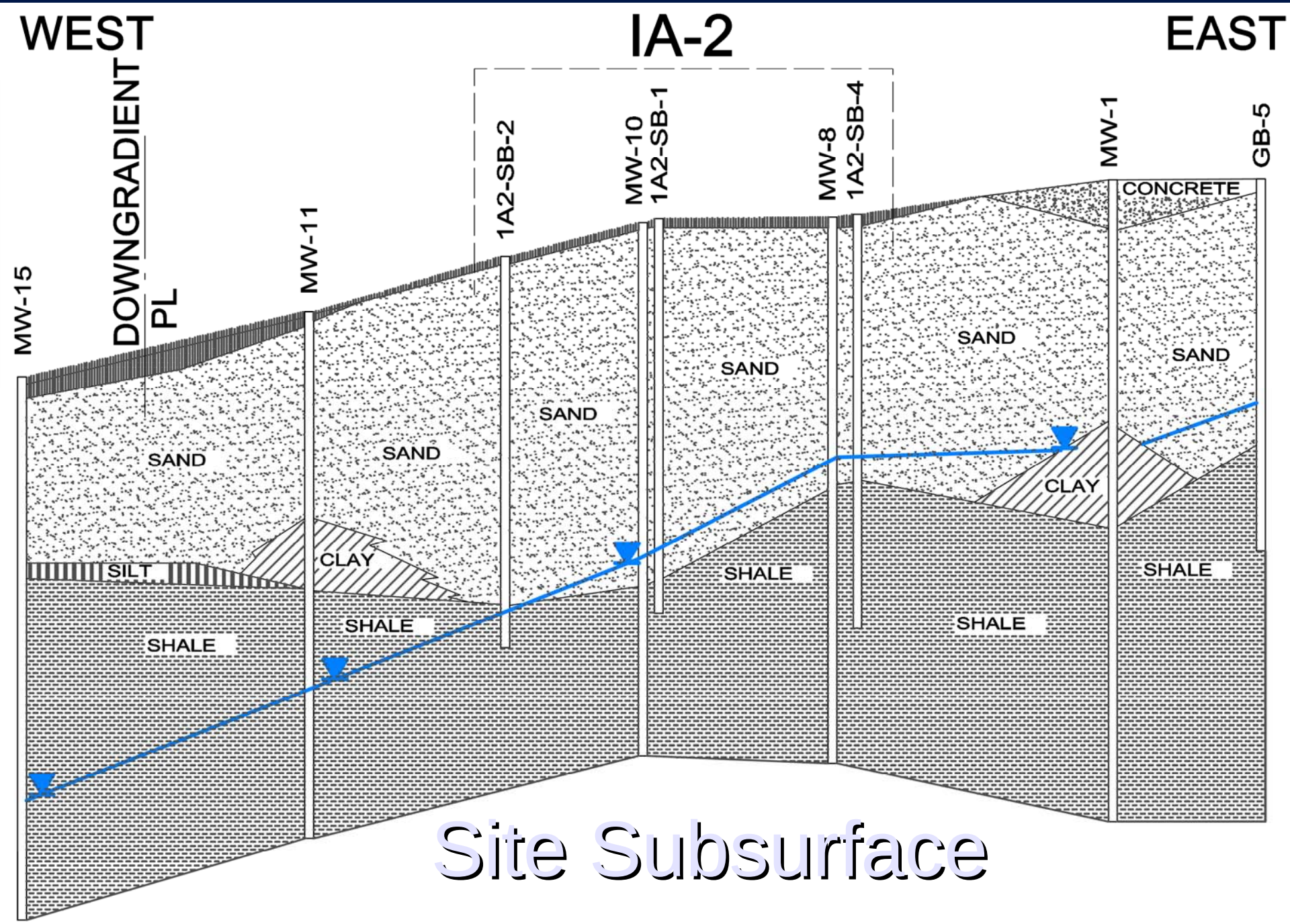
Previous Investigation (cont)

- OVAP Phase I
  - IA-1 through IA-5
  - Eligibility Issues- BUSTR
    - IA-1 Gasoline UST
    - IA-3 Historic fuel station
  - Sources
    - IA-1 Residual HC impacted Soils
    - IA-2 Former Dry Cleaner (**PCE and CVOC)**
    - IA-5 Garage – Vehicle Lift

OVAP Phase II Investigation

OBJECTIVES

- Address eligibility issues from Phase I;
- Are Applicable standards met? If not, then..
- **Implement Remedial and/or Risk-based** activities at the remaining IAs.

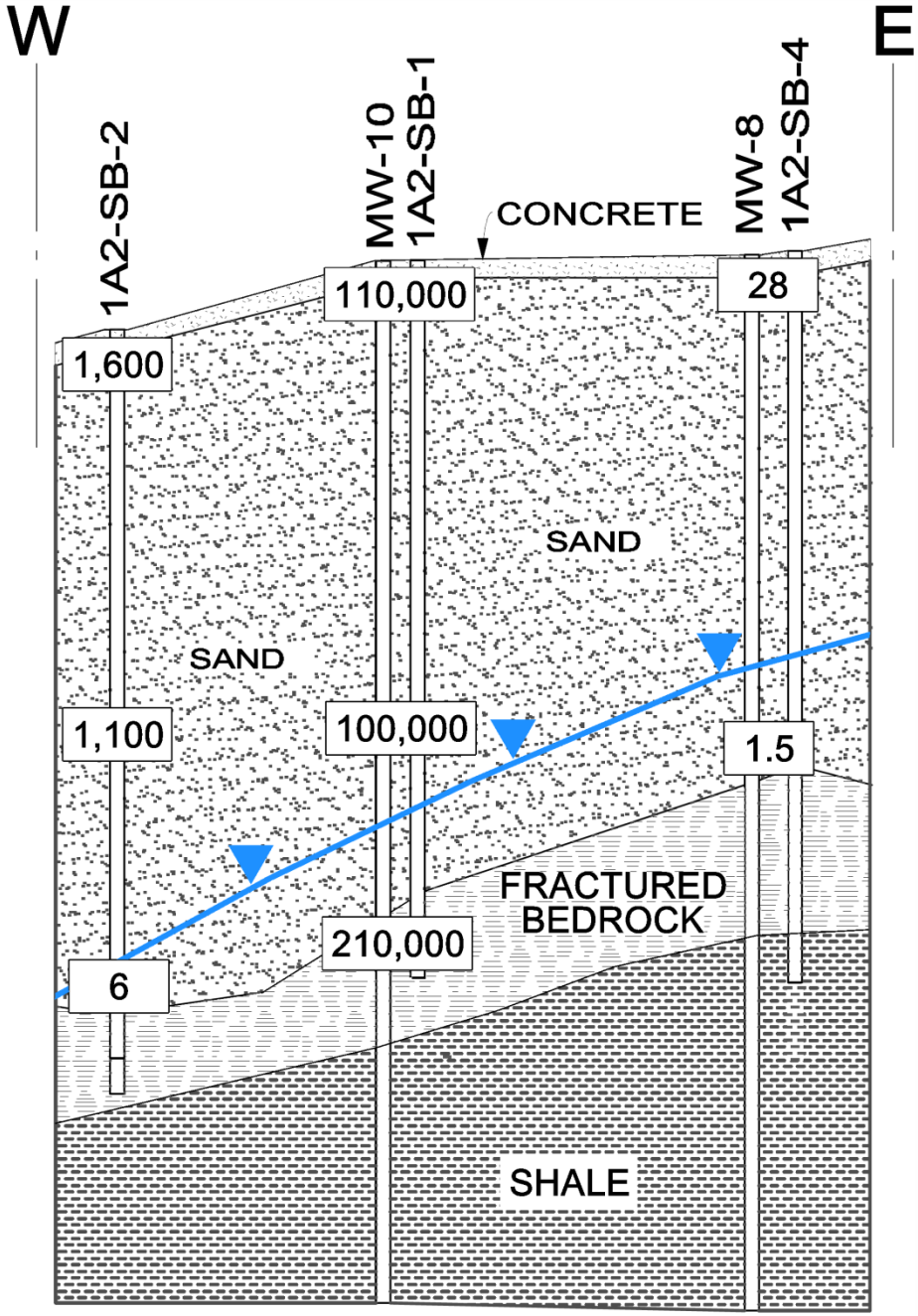

WEST
IA-2
EAST
DOWNGRADIENT
PL
MW-15
MW-11
1A2-SB-2
MW-10
1A2-SB-1
MW-8
1A2-SB-4
MW-1
GB-5
CONCRETE
SAND
SAND
SAND
SAND
SAND
SAND
CLAY
CLAY
SILT
SHALE
SHALE
SHALE
SHALE
SHALE
Site Subsurface

Phase II Investigation Results

- Results Summary
  - Eligibility
    - BUSTR NFA- IA-1
    - BUSTR letter relinquishing authority- IA-3
  - Soils- To meet generic numeric standards
    - IA-4- Surface soil excavation
    - IA-5 – Removal of hydraulic lift and hydrocarbon impacts
    - Following mulitchemical adjustment, the Property meets all VAP commercial / industrial standards for soils.

Phase II Investigation Results
(cont)

- Groundwater – Assessed on site-wide basis
  - Applicable standards not met
  - Issues
    - --Upper groundwater zone exceeded UPUS
    - --potential DNAPL impacts to deeper groundwater
  - Groundwater Response
    - --Property within an Ohio USD area, Class A groundwater.
    - --Massive shale bedrock (approximately 300 feet thick) underlies the soil-bedrock interface.
- Vapor Pathway Complete- IA-2



LEGEND

- CONCRETE
- SILT
- SAND
- CLAY
- SHALE
- 42,000 PCE CONCENTRATION (µg/kg)
- WATER LEVEL

0' 3' VERTICAL SCALE

0' 45' HORIZONTAL SCALE

PCE Source Area

IA-2 Remediation Approaches

- Groundwater Source Removal and Groundwater Treatment
- Source Area Treatment, and GW monitoring
  - Chemical Oxidation OR Dual Phase Extraction
- Source Area Removal GW monitoring

IA-2 Remediation Approaches (cont)

- Did meet client preferences for liability reduction, but,
- Did NOT meet client preferences for :
  - Cost and Timeliness
    - Cost range- $200K-500K
    - Time range 2-3 years with monitoring
  - Interference with site activities; adjacent residential concerns;
  - Uncertain, lengthy source area investigation in fractured bedrock

Risk Based Considerations

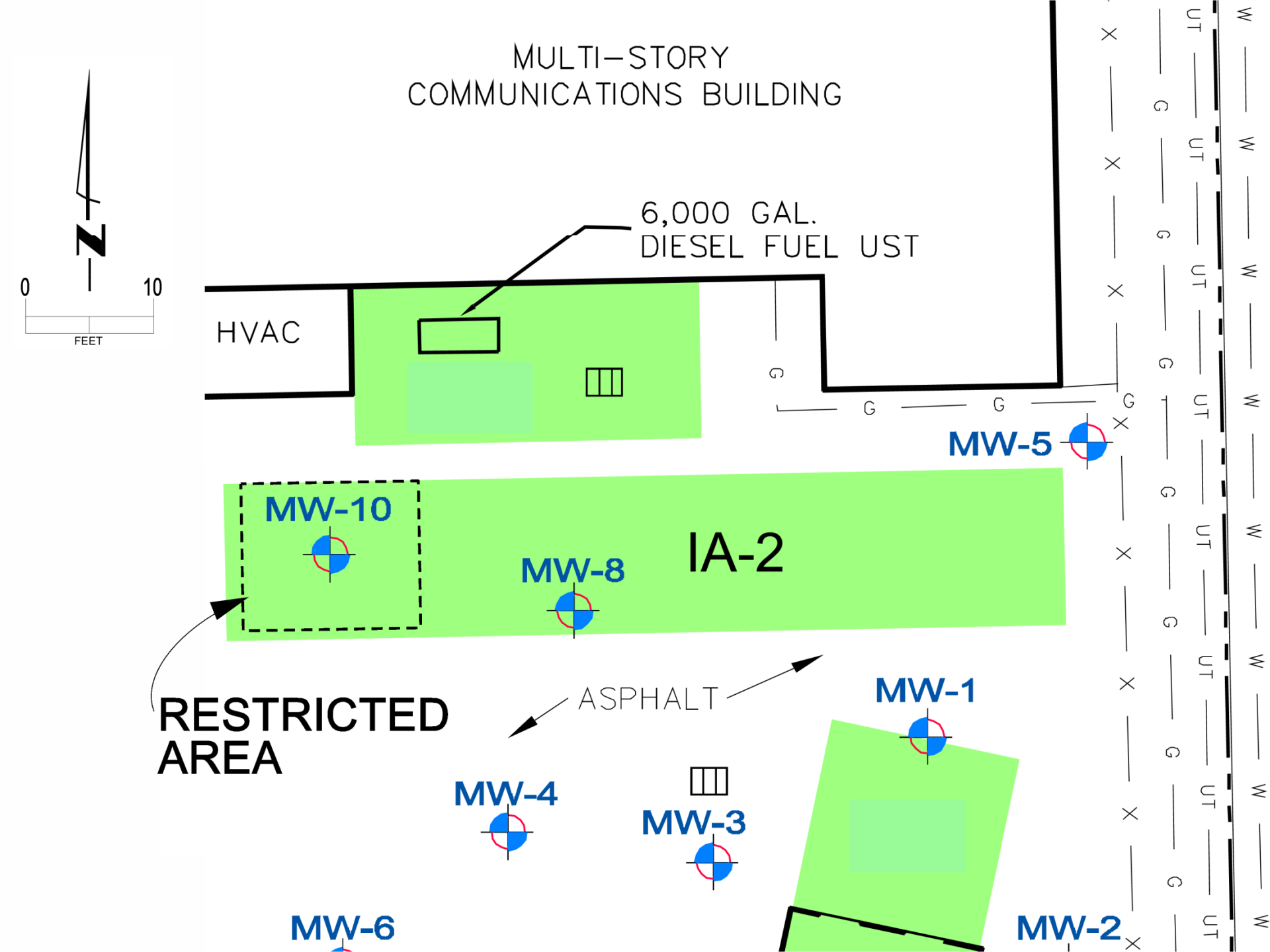
1. Reason to consider leaving in place;
   - Soil source small and well defined
   - COCs in groundwater are static and decrease quickly in down gradient wells
   - Future Property transaction unlikely
   - Future changes in Volunteer's site activities unlikely
   - Preliminary RA- engineering controls likely not needed.

Risk Assessment Activities

- Address Vapor pathways (IA-1, IA-2, IA-5)
  - On-site Potable- Site Workers
    - On-site & Off-site Non-Potable/Incidental Contact - Construction Workers
    - On-site Vapor Intrusion to Indoor Air - Site Workers
    - Off-site Vapor Intrusion to Indoor Air – Residences
- Site-wide institutional control prohibiting removal or use of groundwater

Risk Assessment Activities (cont)

- Re-sampled Groundwater
- IA-1,IA-5- Assessed indoor air based on post-excavation results.
- IA-2 – Conducted Vapor Sampling
  - Adjacent Communication Building
  - Seven first floor, two basement locations
  - Results- <1 ppbv for COCs


MULTI-STORY
COMMUNICATIONS BUILDING
6,000 GAL.
DIESEL FUEL UST
HVAC
N
0
10
FEET
MW-5
MW-10
MW-8
IA-2
RESTRICTED
AREA
ASPHALT
MW-1
MW-4
MW-3
MW-6
MW-2

Risk Assessment Results

- IA-1, IA-5; Applicable standards for indoor air satisfied.
- IA-2 -- Institutional control implemented
  - Prevents excavation and building construction above PCE source area (30’x30’)
  - Addresses future on-site exposures to ground water via non-potable (construction worker incidental contact) uses;
- No ongoing remedies, and no engineering controls required by OVAP

SUMMARY

- In summary, no unacceptable risk to current or future human health remain, and NFA and CNTS received.
- Use of a risk-based solution relied on the following OVAP elements:
  - Groundwater responses in USD settings, and deed restriction for future use;
  - Required indoor air sampling to evaluate risk from to nearby active buildings from current and future exposures to volatile emissions;
  - Institutional control preventing building construction or excavation within the source area IA.

BENEFITS

- Benefits of Risk-Based Approach
  - Meets Local and Corporate Client Requirements
  - Avoid cost of remedial investigation and DNAPL remediation/ removal;
  - No interruption to local operations
  - No engineering controls, or O&M activities
  - A ‘greener’ remedial approach;
  - Source Area secure- Future property transaction unlikely.

Questions?