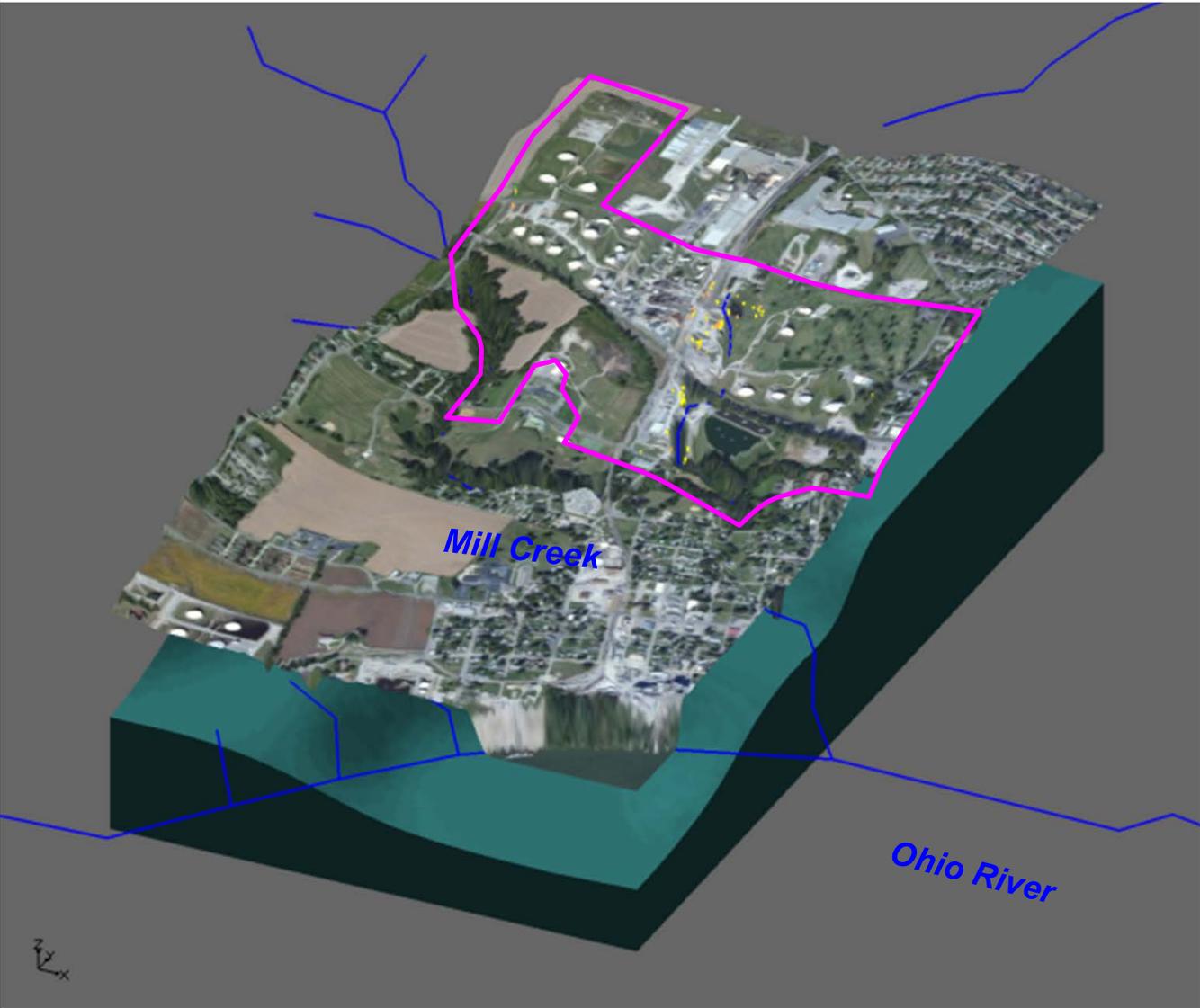


# Review of Existing Data to Develop a Preliminary Conceptual Site Model

Countrymark Site in Mt. Vernon, IN



# Conceptual Site Model – Site View



**Legend**

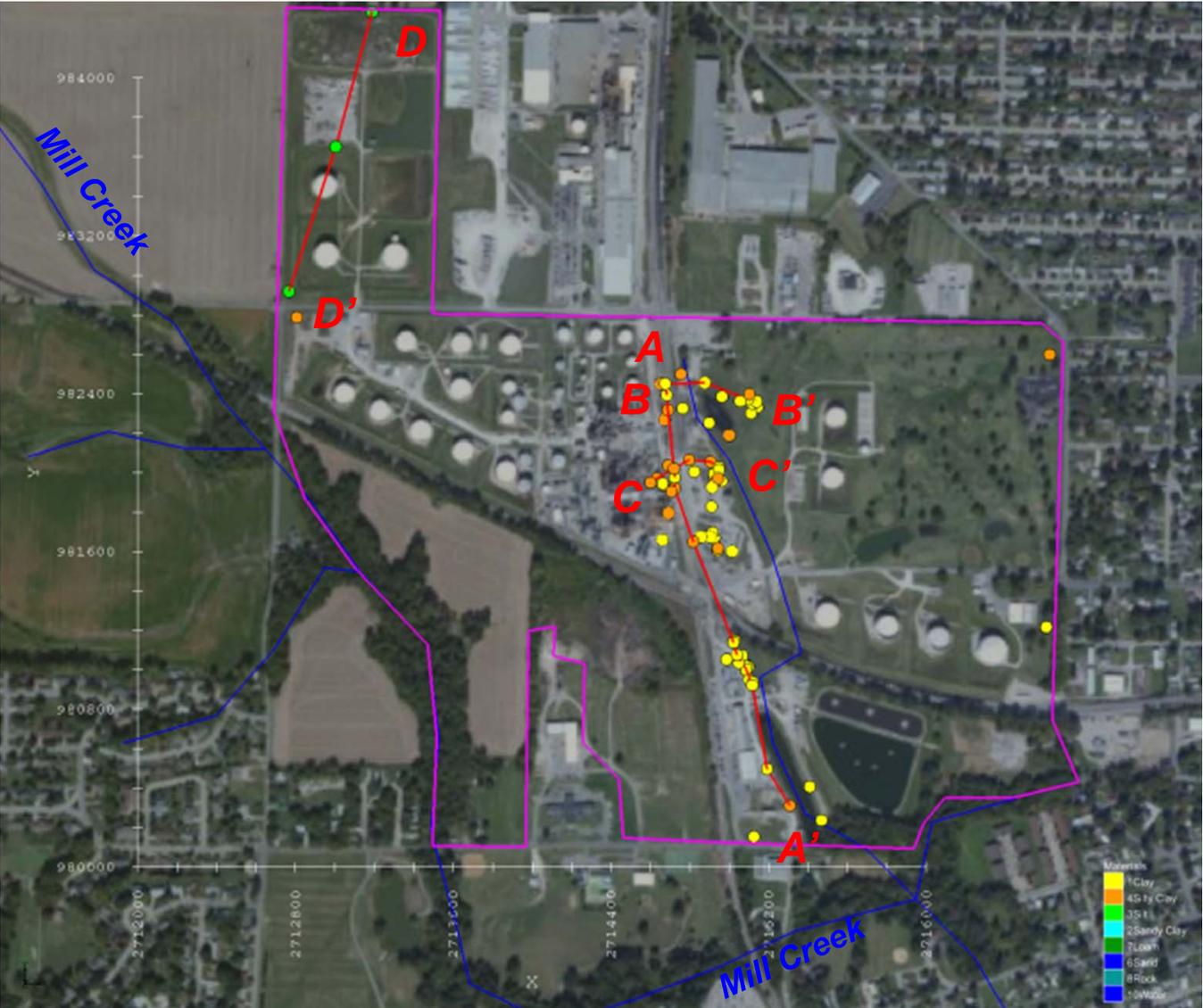
- Wells/boreholes
- 3-D drainage networks
- Bedrock
- Property boundary on 3-D ground surface

**Note:**

- 10x vertical exaggeration
- Viewing northwest
- Aerial image draped over 3-D ground surface



# Cross Section Trace Map

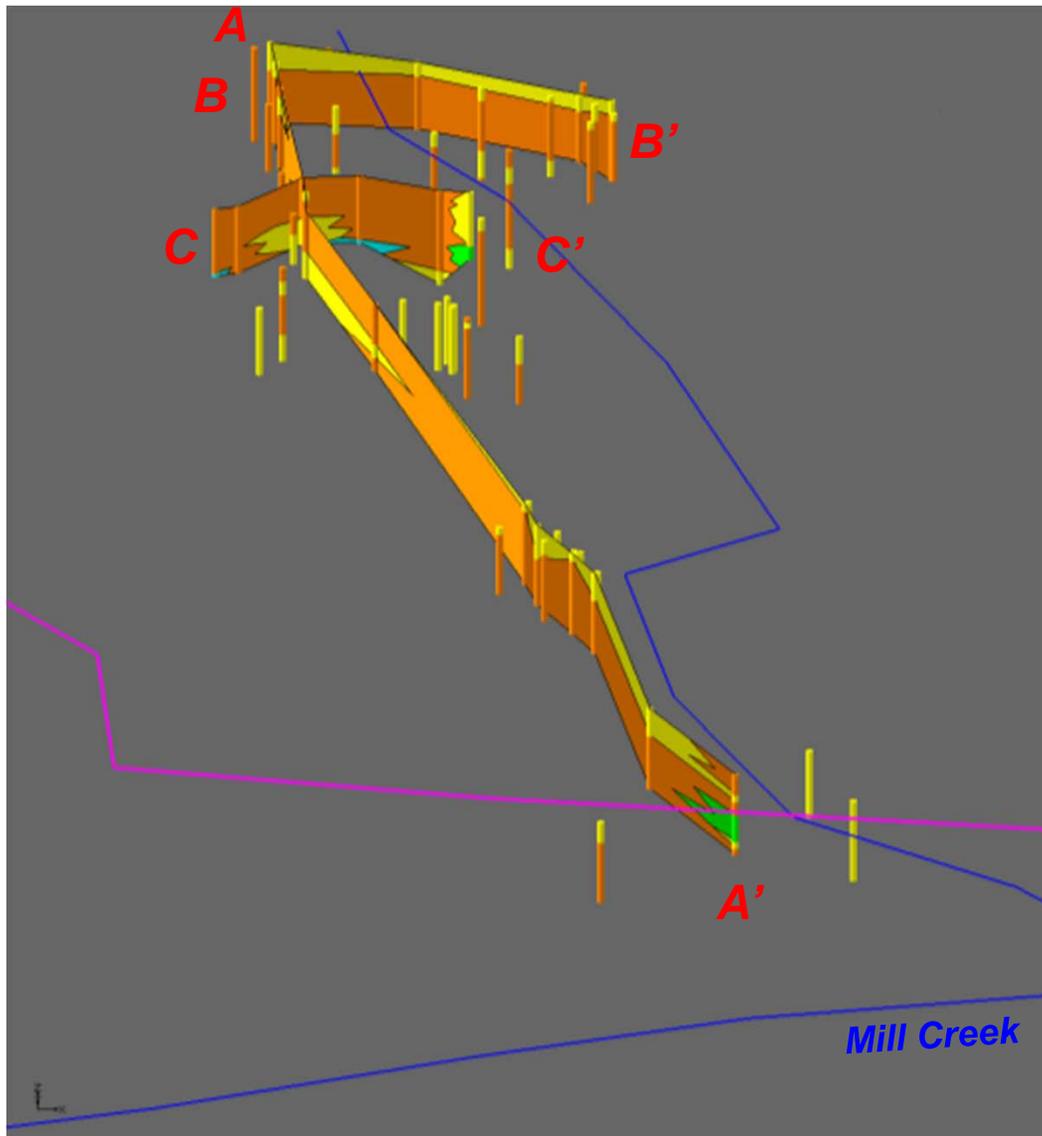


- Legend**
- Wells/boreholes
  - 3-D drainage networks
  - Geological cross-section locations
  - 3-D property boundary on ground surface

**Note:**  
 Scale: 1" = 800'  
 NAD83 IN State Plane  
 Coordinate System West  
 Zone in feet  
 2711300, 984400, 979280

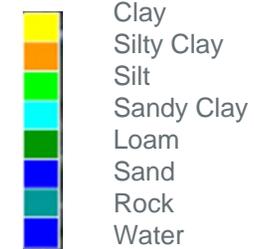


# Geologic Cross Sections



## Legend

- Wells/boreholes
- 3-D drainage networks
- 3-D property boundary on ground surface

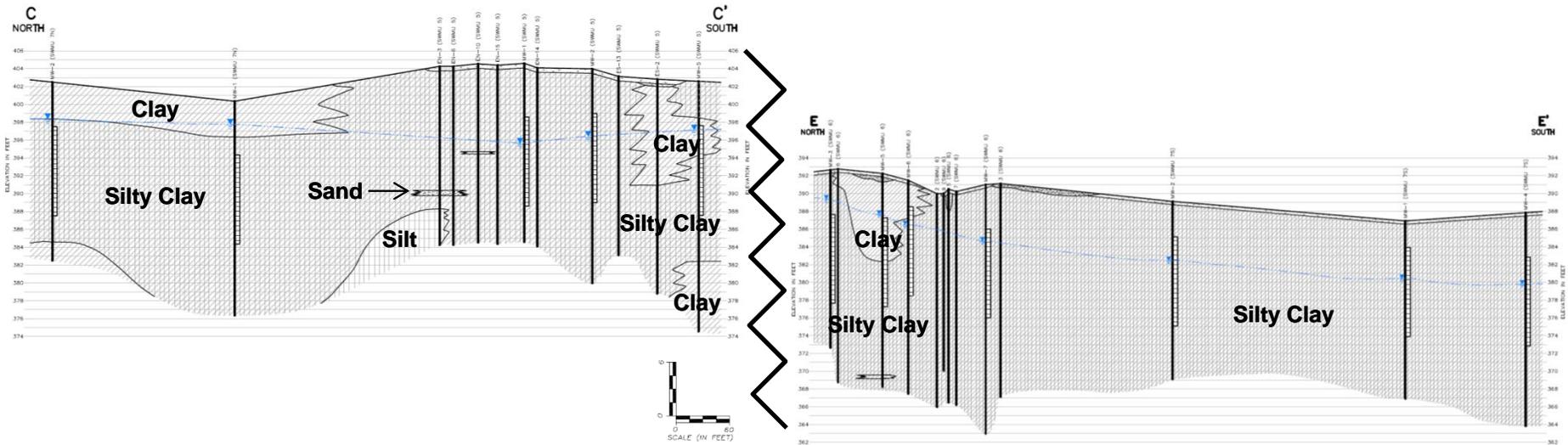


## Note:

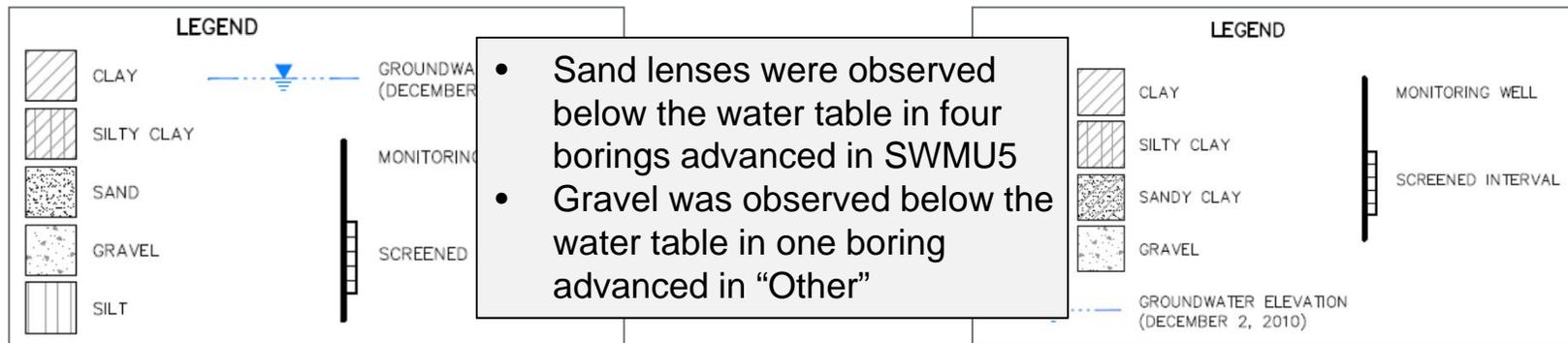
- 5x vertical exaggeration
- Viewing north



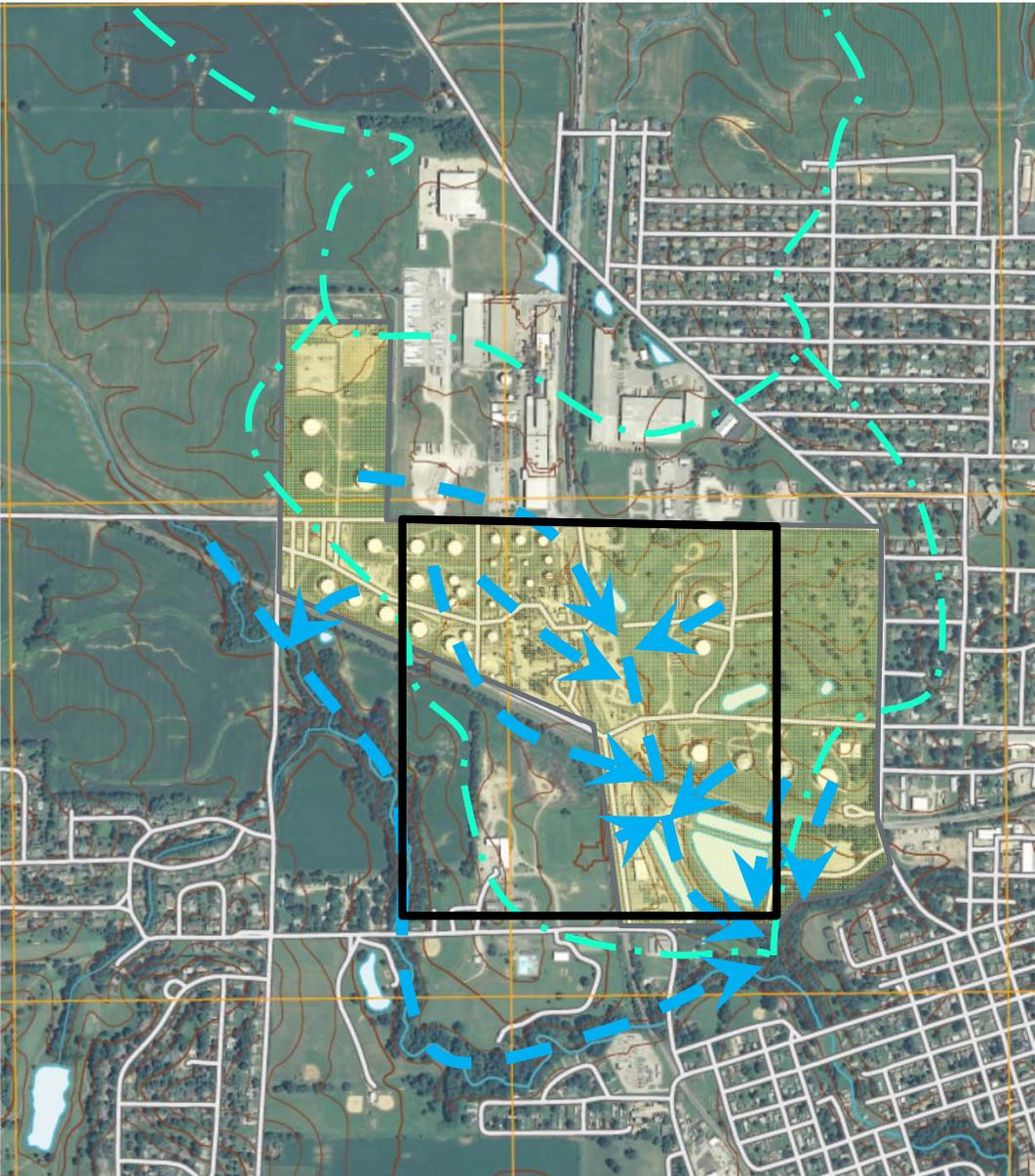
# Geologic Cross Section



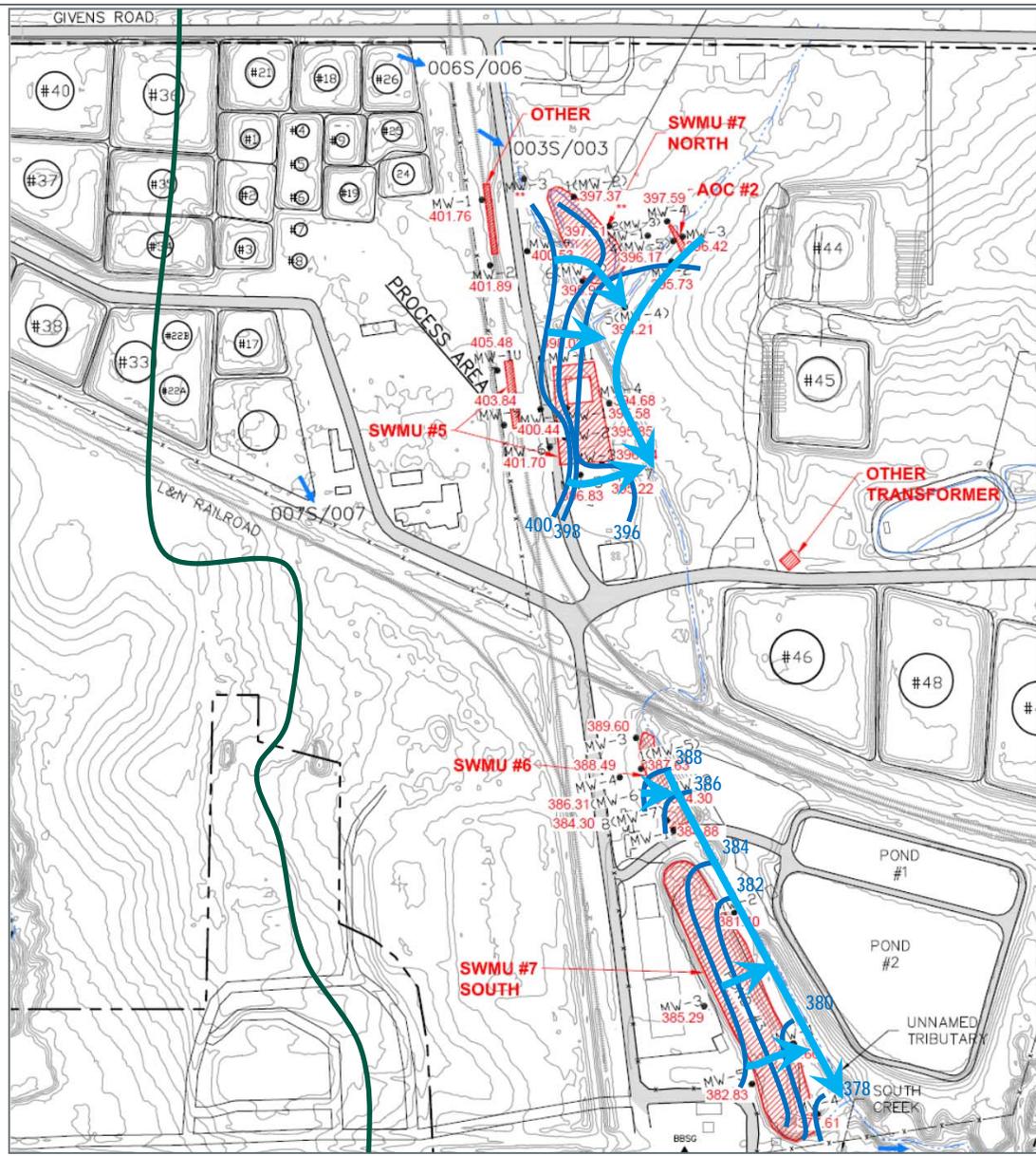
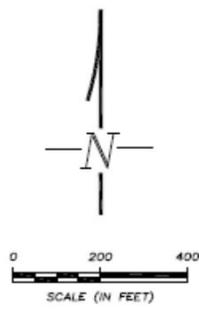
Geometric Average Hydraulic Conductivity (K) Value:  $4 \times 10^{-4}$  cm/s  
 (K values range from  $3 \times 10^{-5}$  to  $2 \times 10^{-3}$  cm/s)



# Drainage Basins



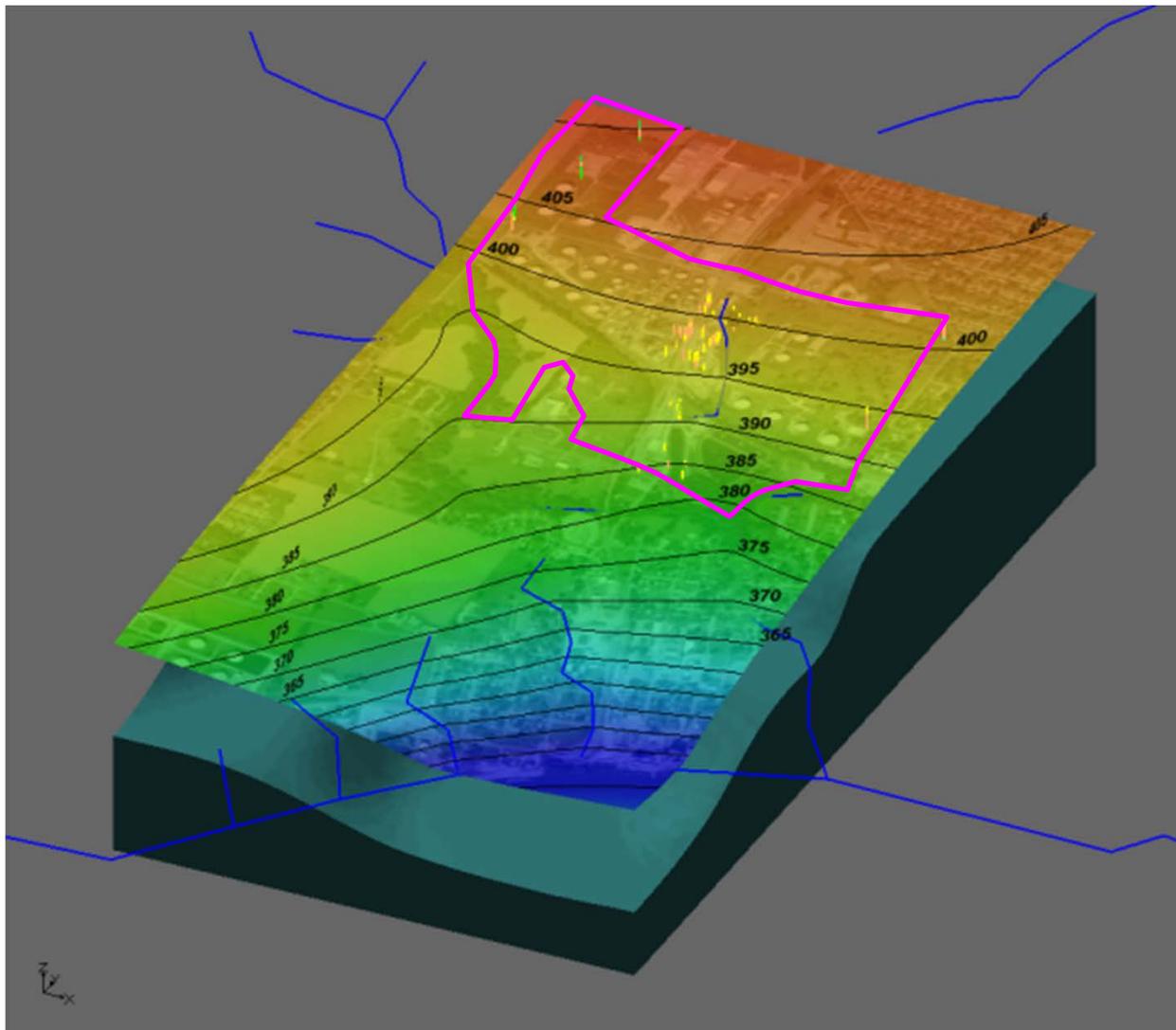
# Shallow Groundwater Elevation Data



**Legend**  
 ——— Drainage Basin Divide



# Modeled Regional Groundwater Contours



## Legend

- Wells/boreholes
- 3-D drainage networks
- Bedrock
- Modeled groundwater contours, feet amsl

## Note:

10x vertical exaggeration

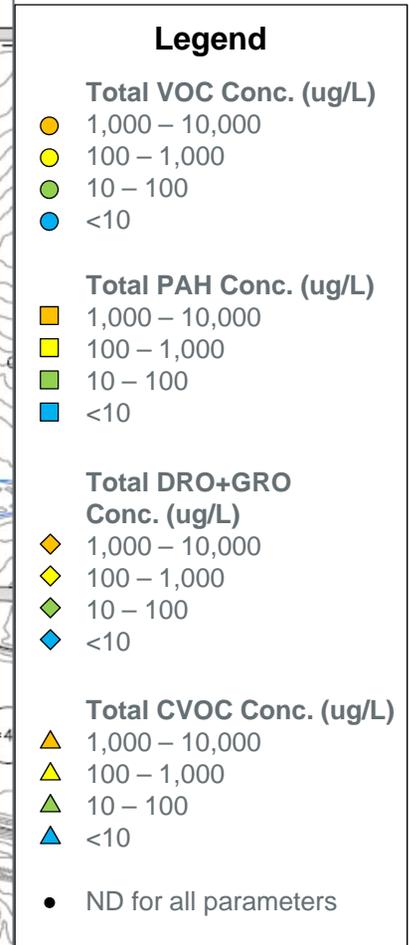
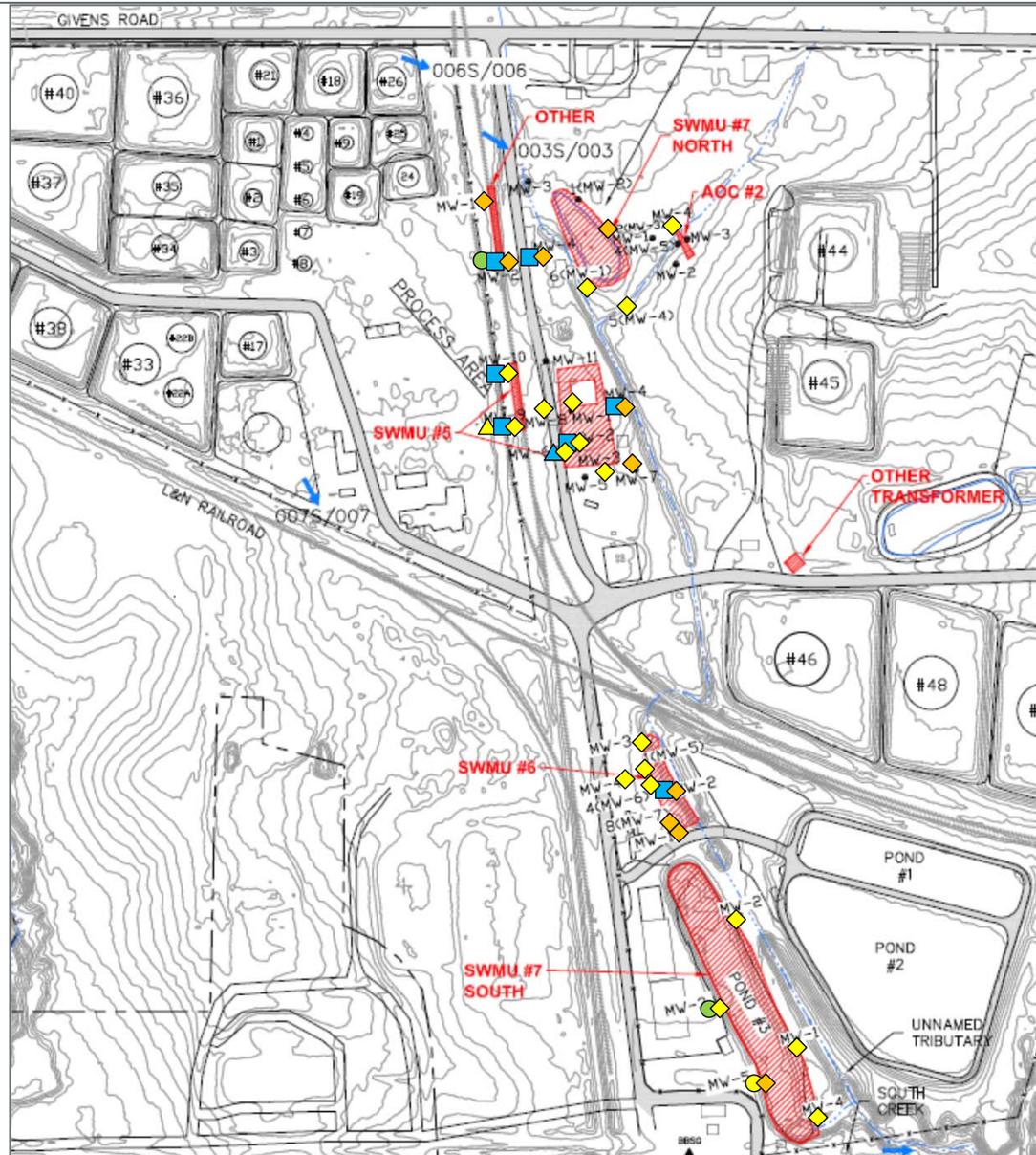
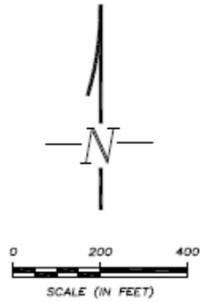
Viewing northwest

Groundwater contours developed based on observed data at the Site and regional groundwater modeling

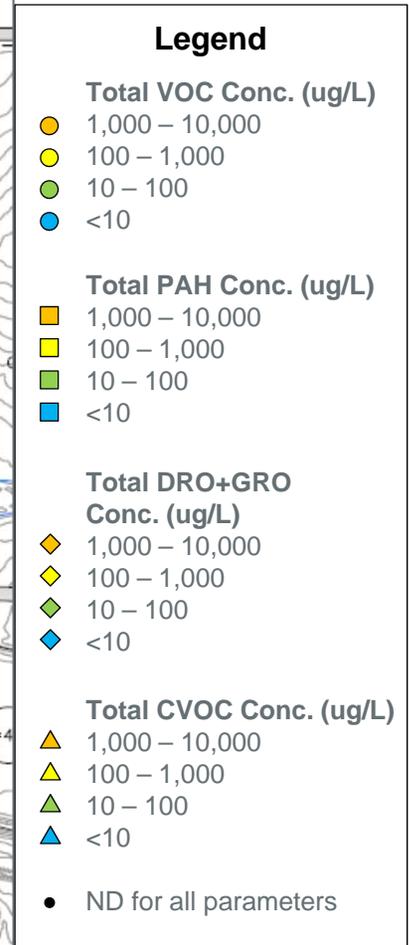
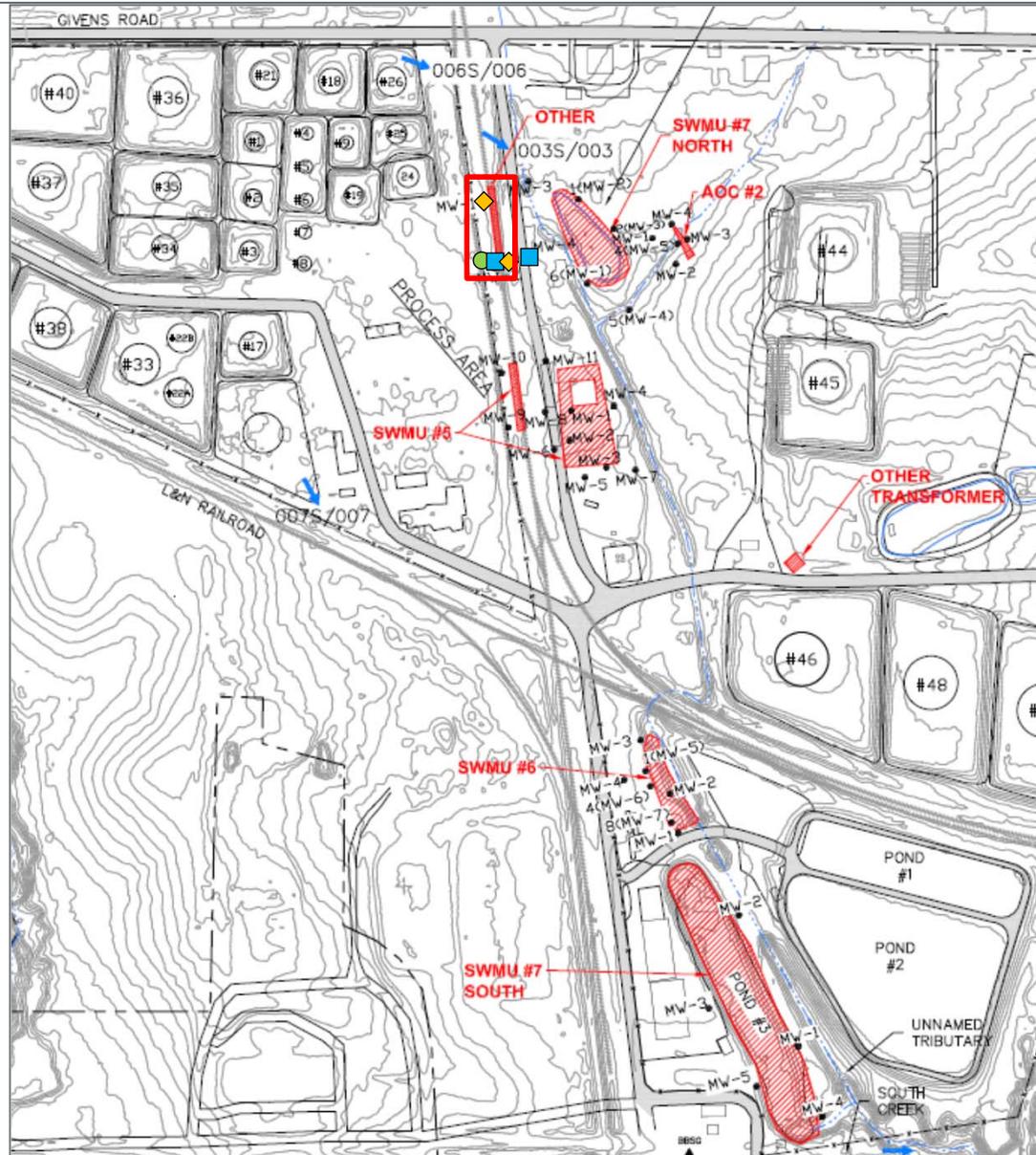
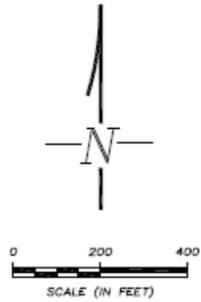
Aerial image draped over 3-D groundwater table



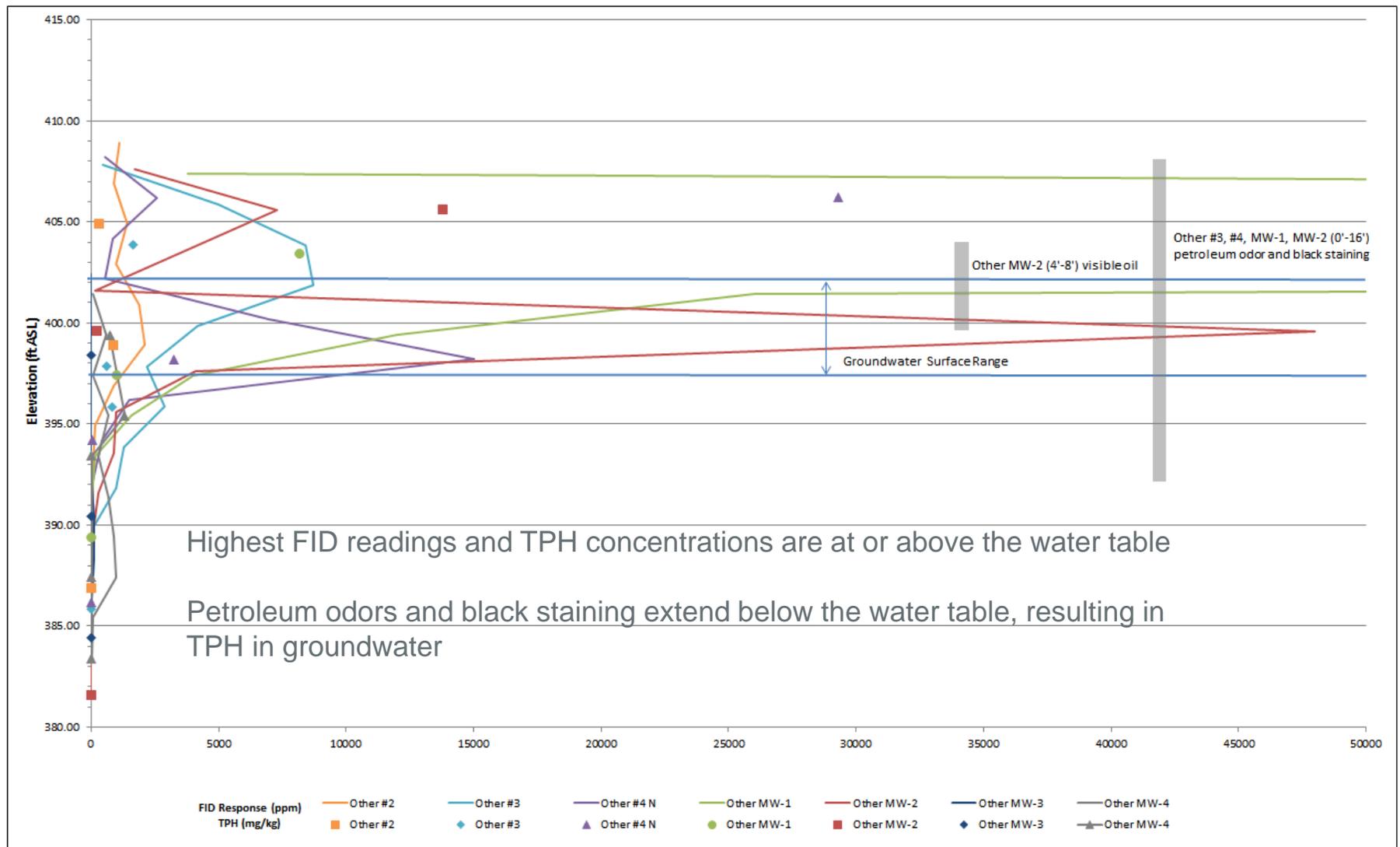
# Groundwater Contamination



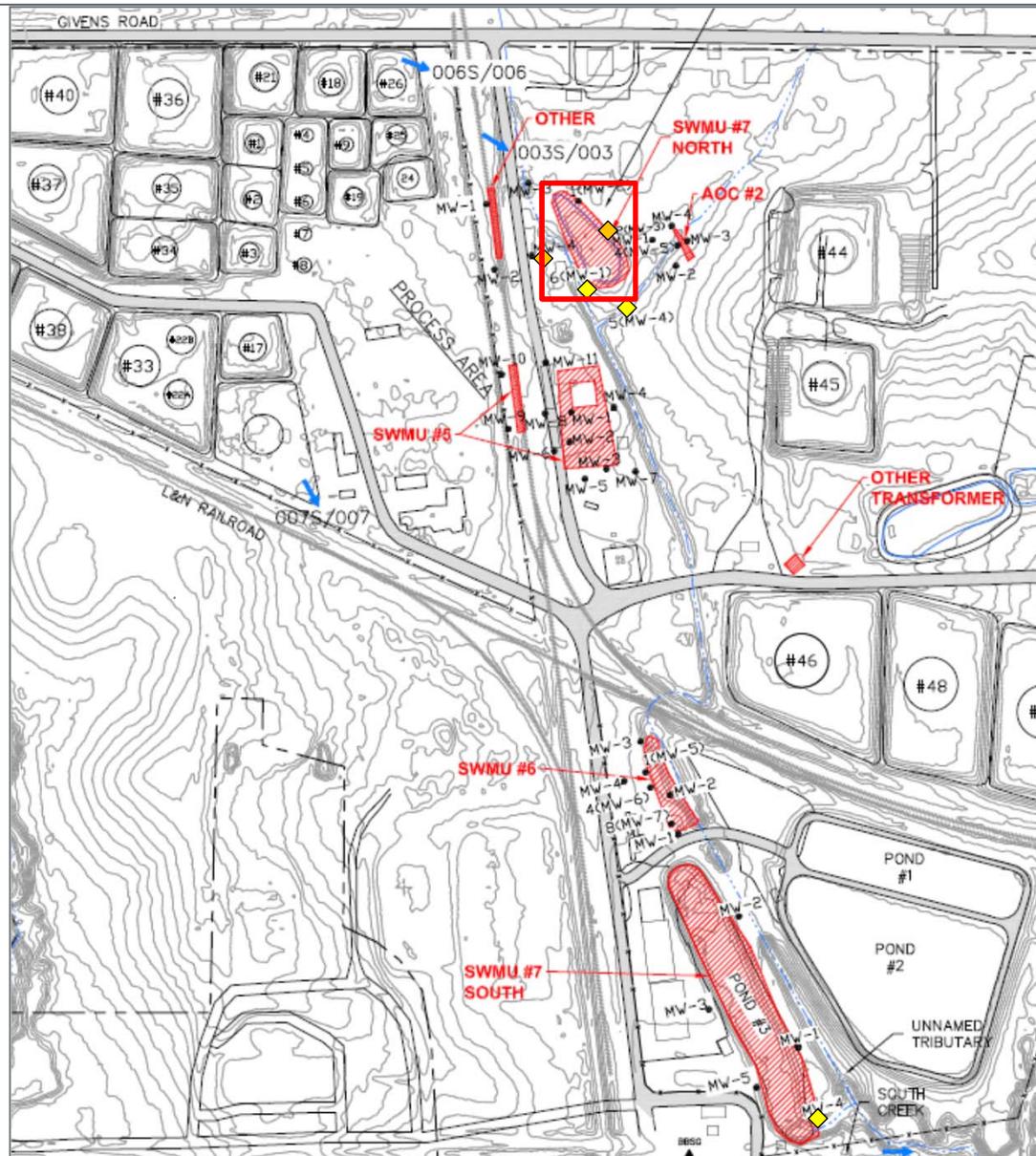
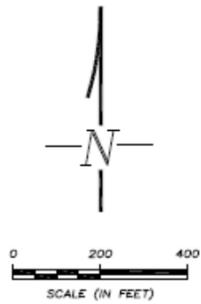
# Groundwater Contamination: Other



# Other Composite Soil Dataset



# Groundwater Contamination: SMWU 7 North



**Legend**

**Total VOC Conc. (ug/L)**

- 1,000 – 10,000
- 100 – 1,000
- 10 – 100
- <10

**Total PAH Conc. (ug/L)**

- 1,000 – 10,000
- 100 – 1,000
- 10 – 100
- <10

**Total DRO+GRO Conc. (ug/L)**

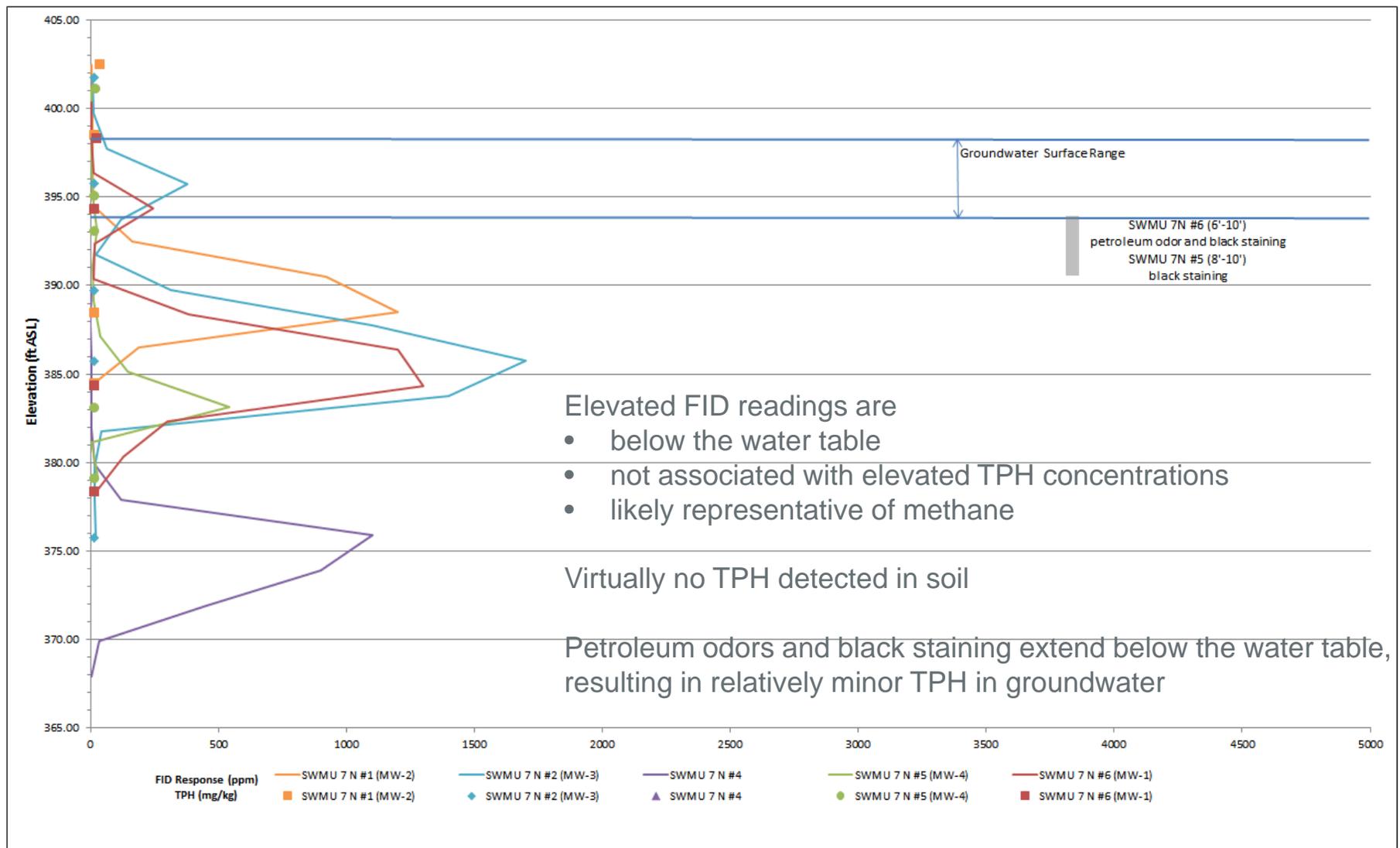
- ◆ 1,000 – 10,000
- ◆ 100 – 1,000
- ◆ 10 – 100
- ◆ <10

**Total CVOC Conc. (ug/L)**

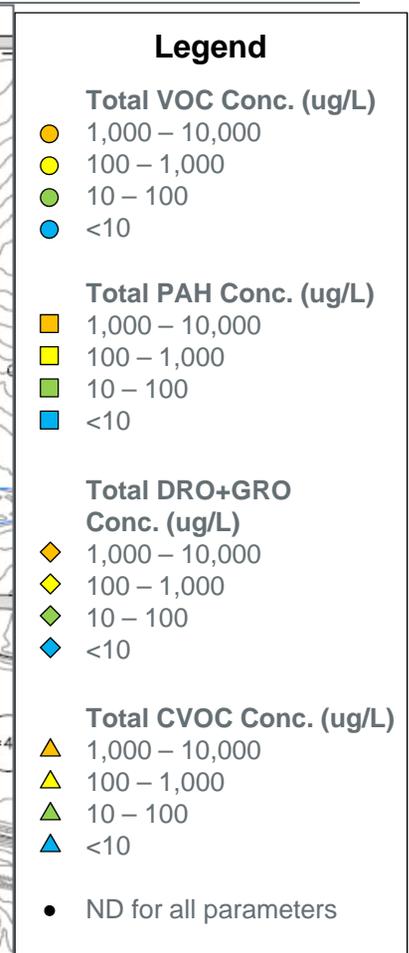
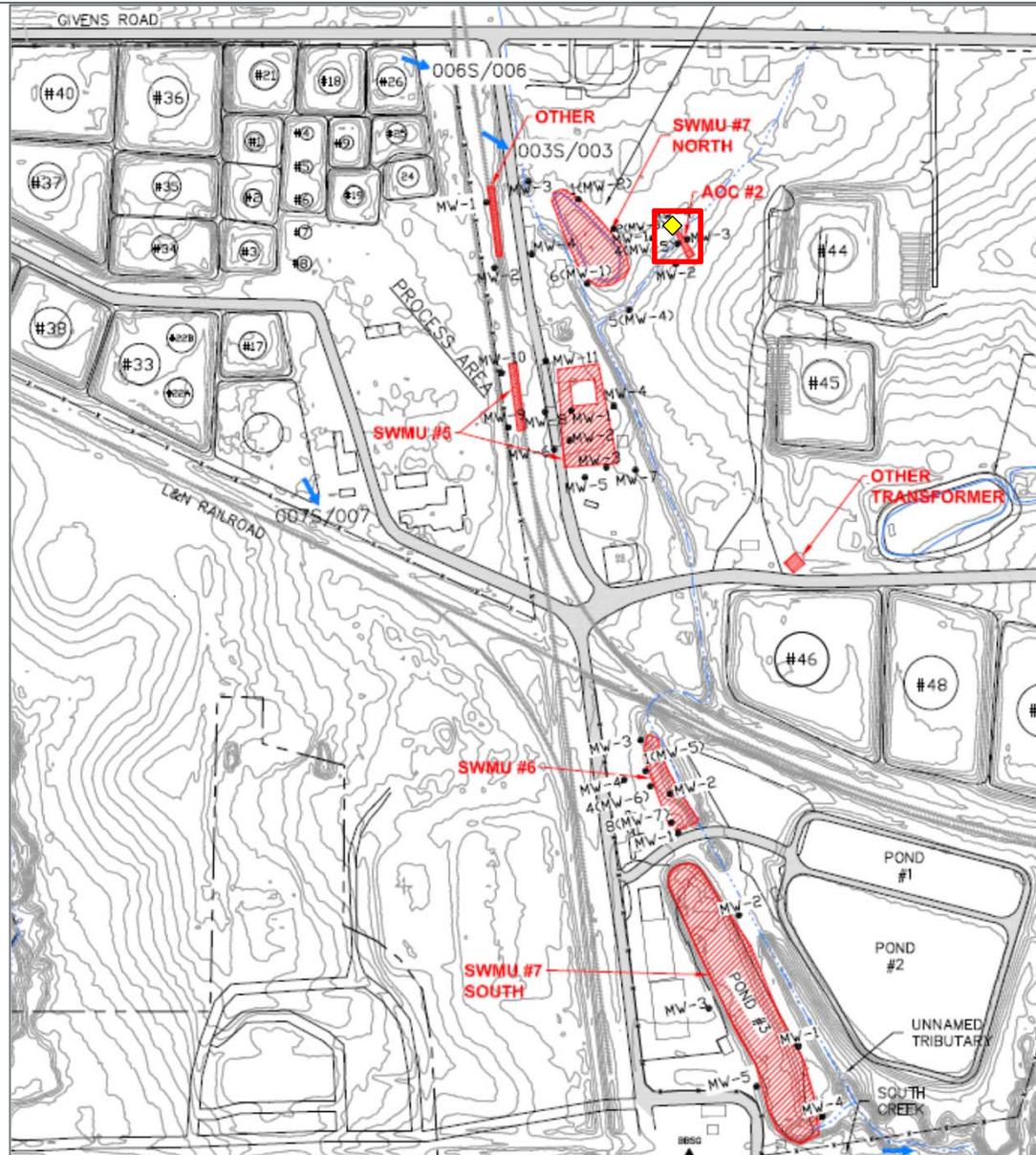
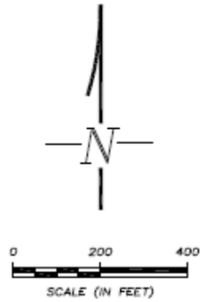
- ▲ 1,000 – 10,000
- ▲ 100 – 1,000
- ▲ 10 – 100
- ▲ <10

● ND for all parameters

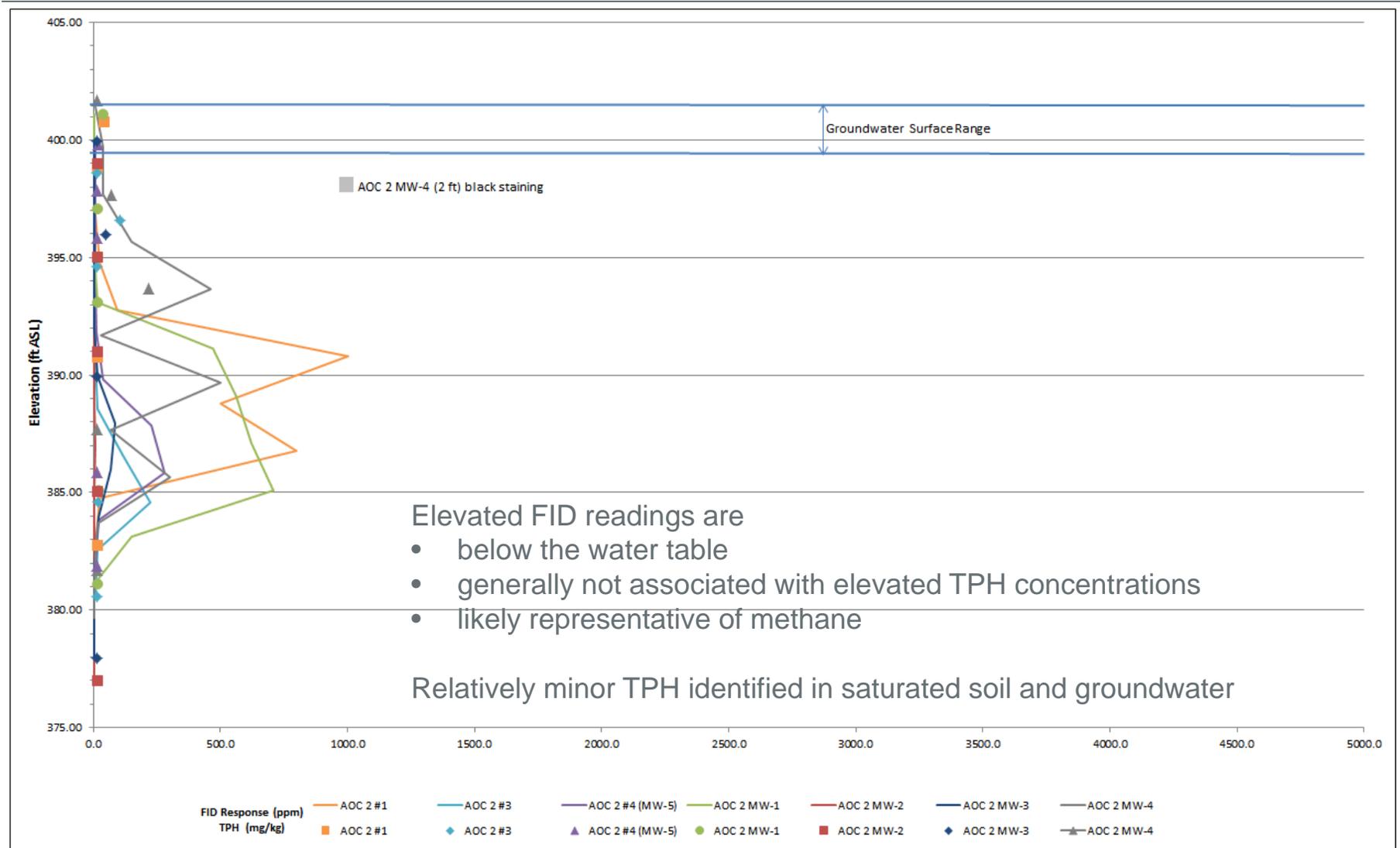
# SMWU 7 North Composite Soil Dataset



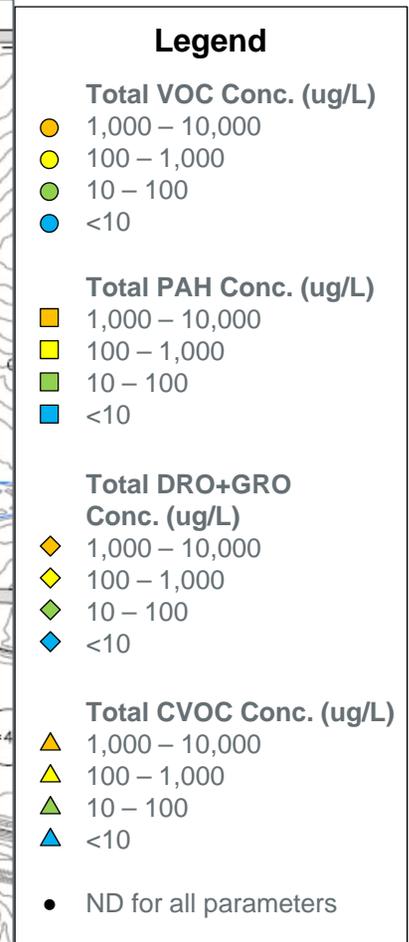
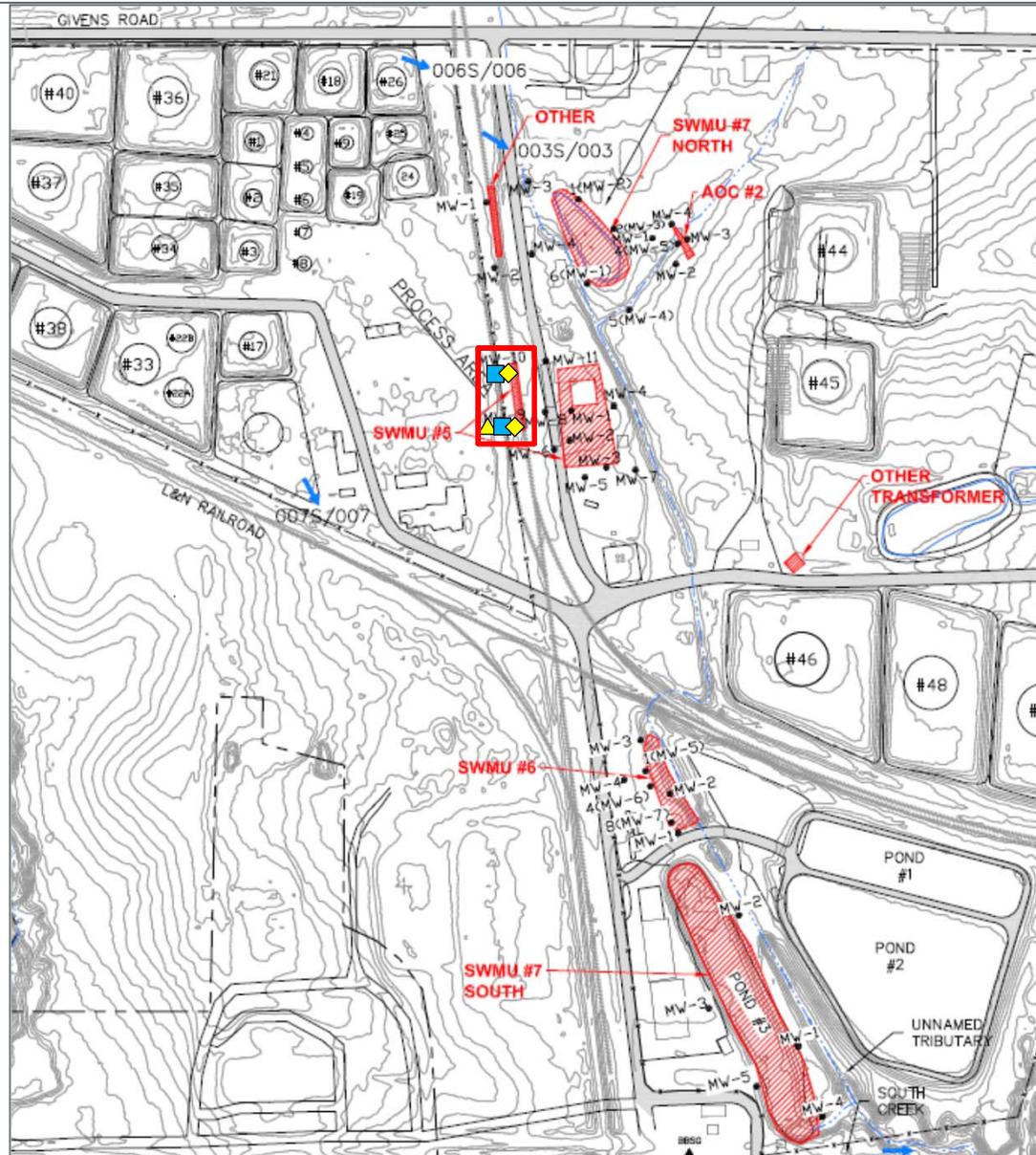
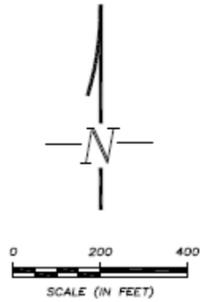
# Groundwater Contamination: AOC 2



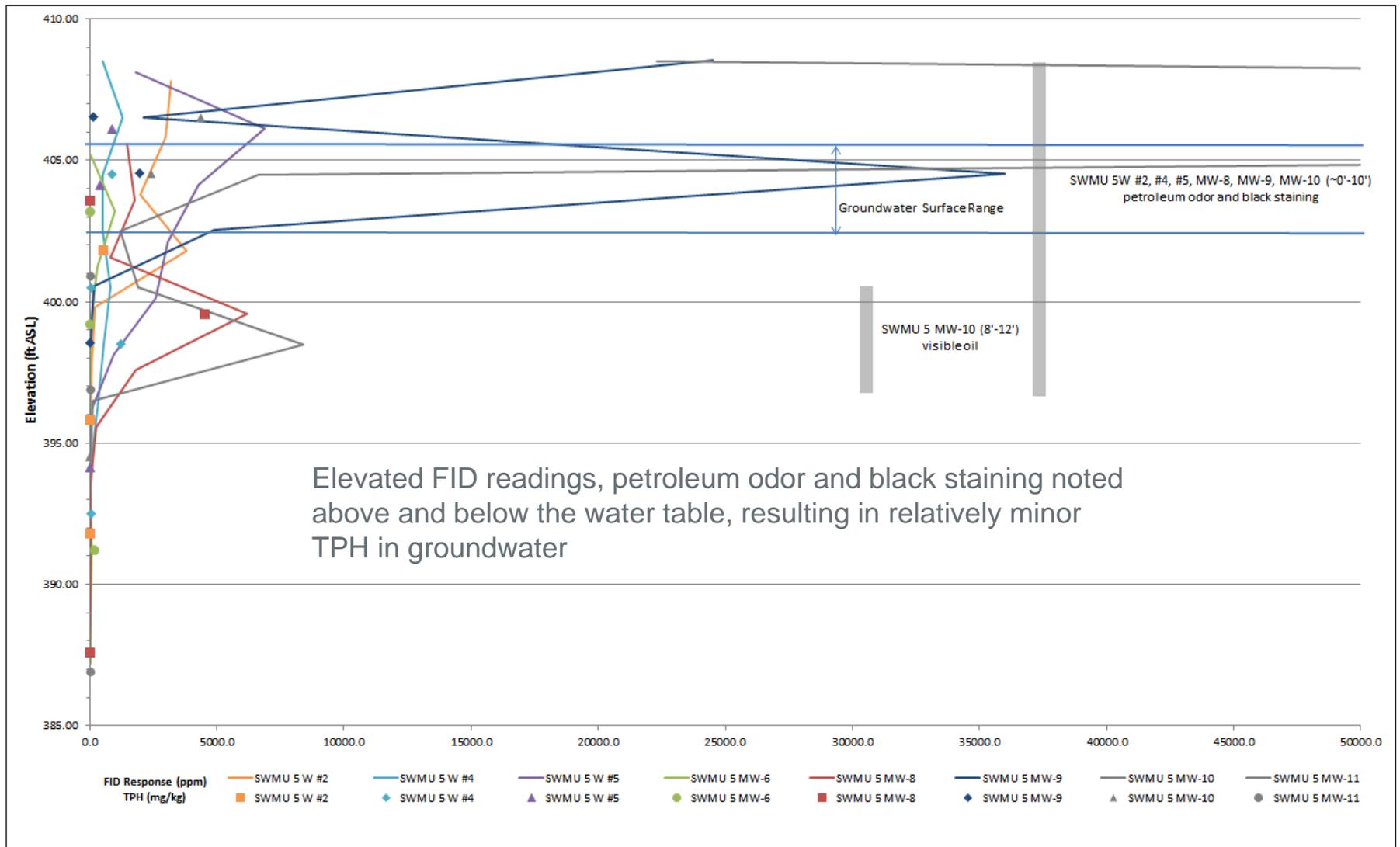
# AOC 2 Composite Soil Dataset



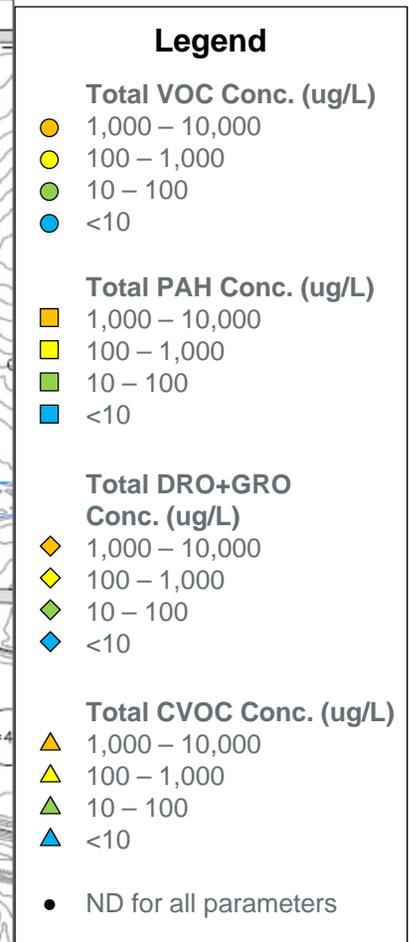
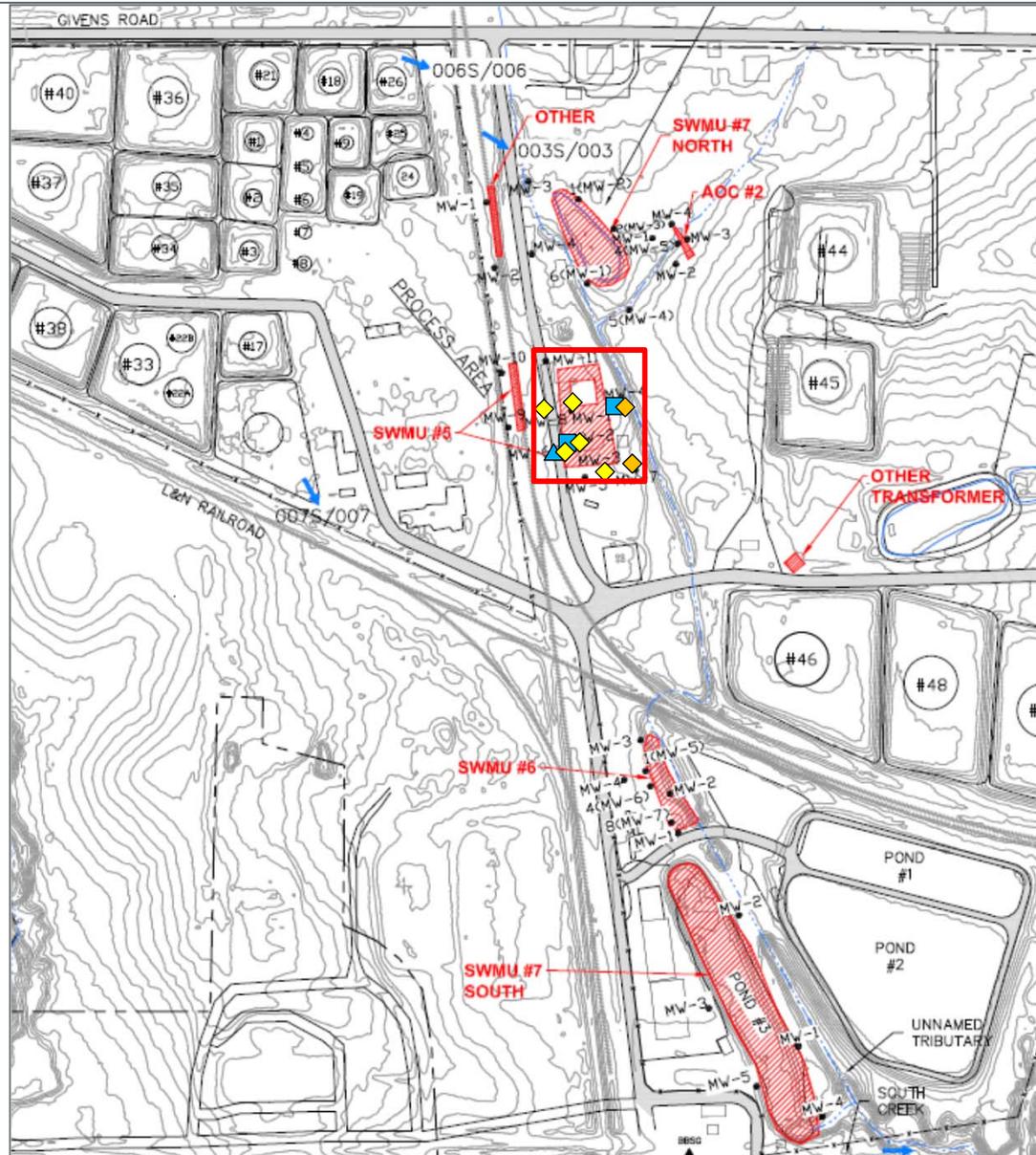
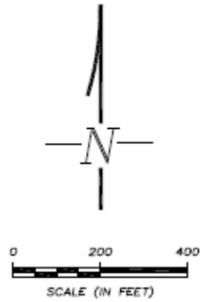
# Groundwater Contamination: SMWU 5 (west)



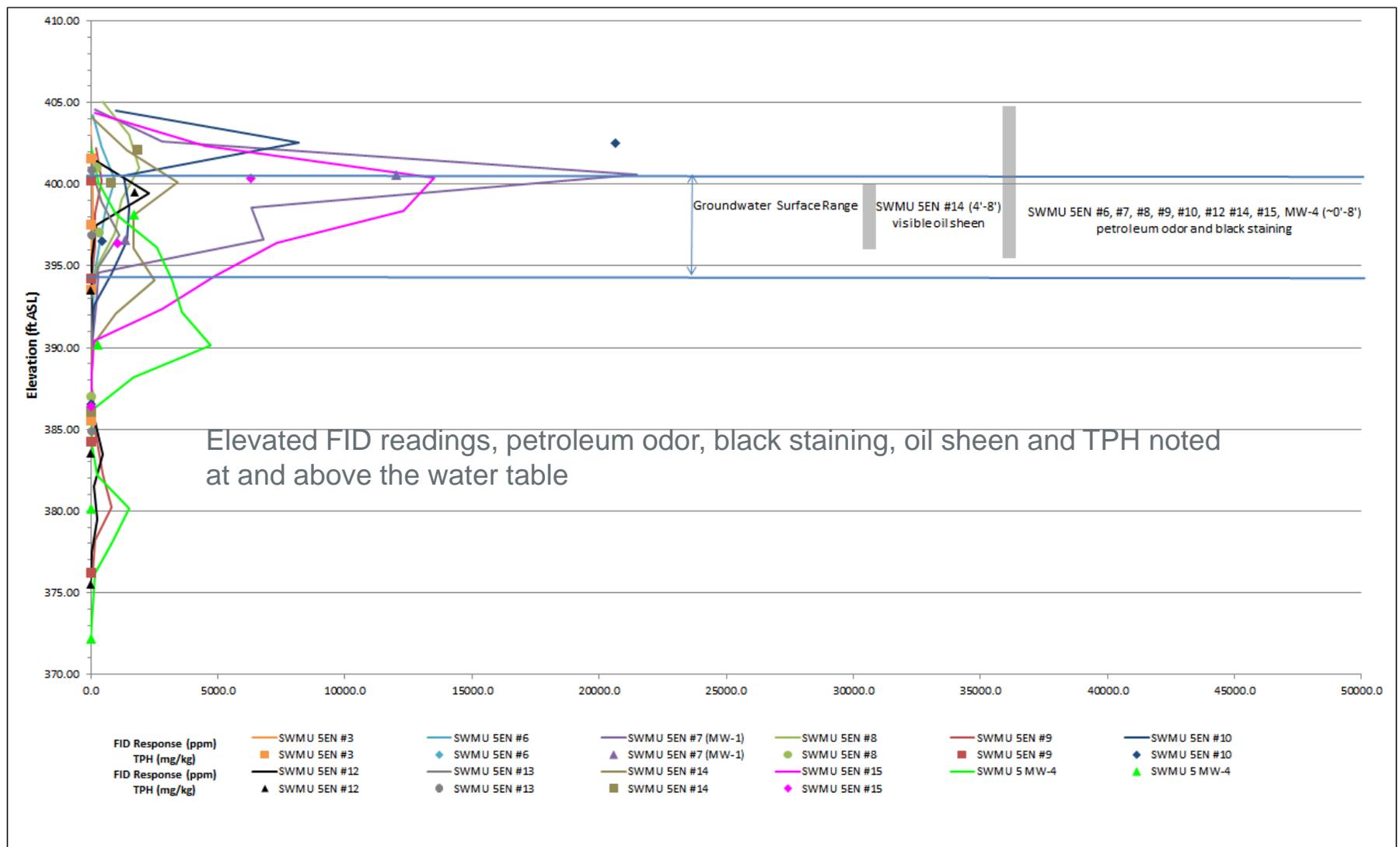
# SMWU 5 (west) Composite Soil Dataset



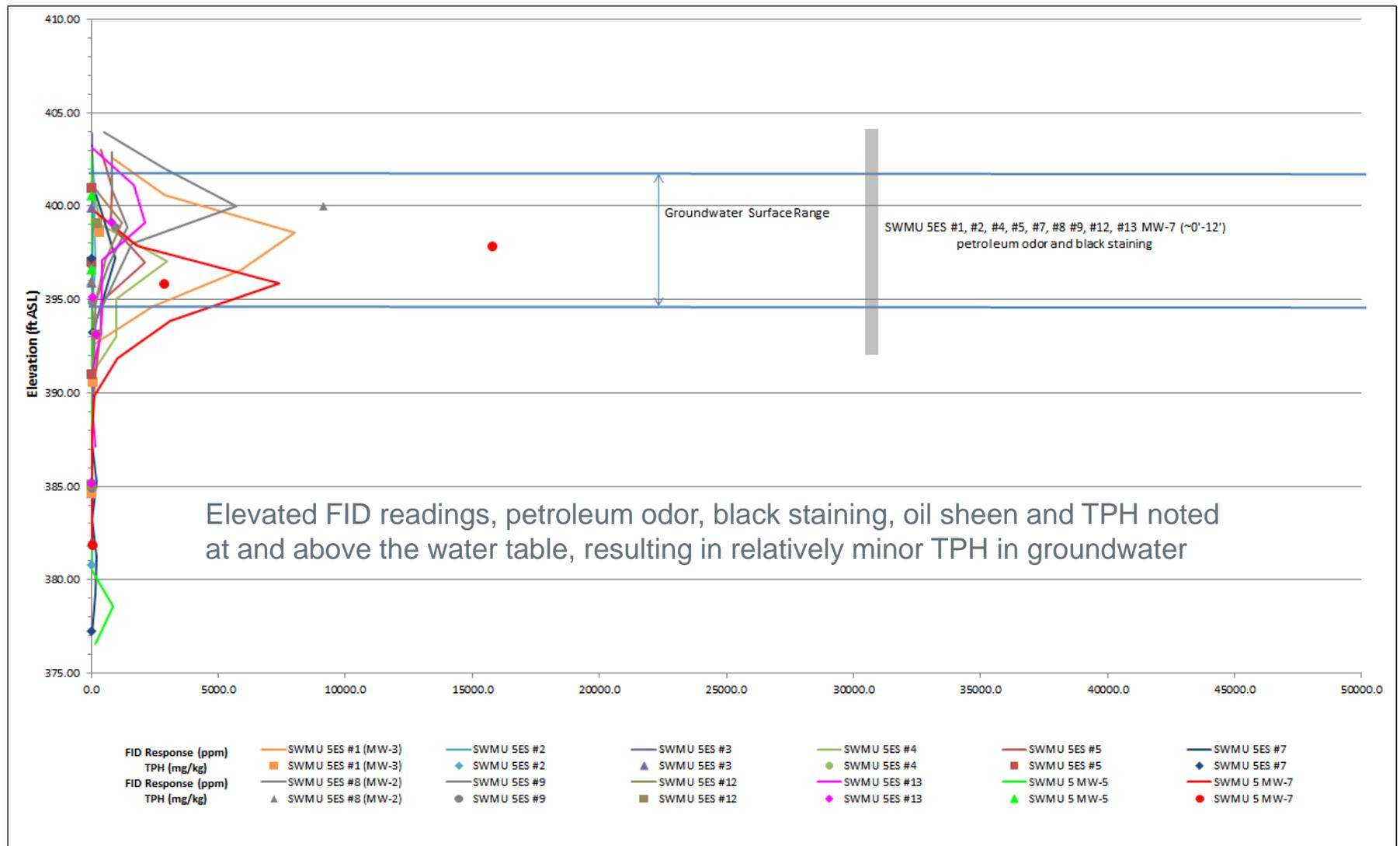
# Groundwater Contamination: SMWU 5 (east)



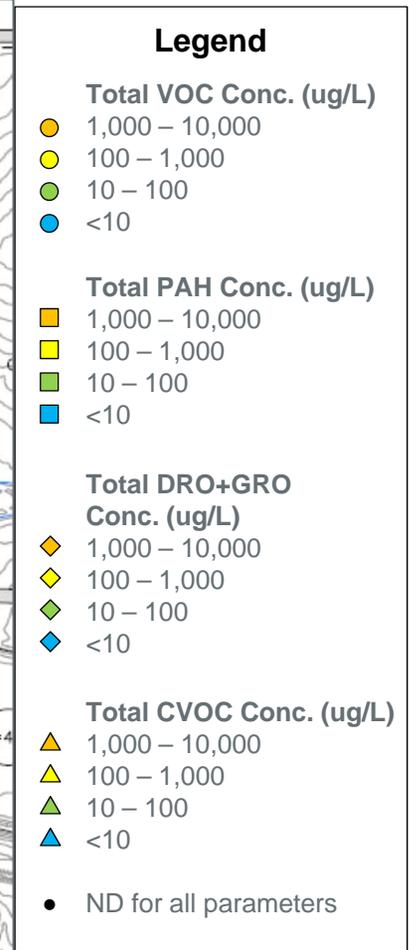
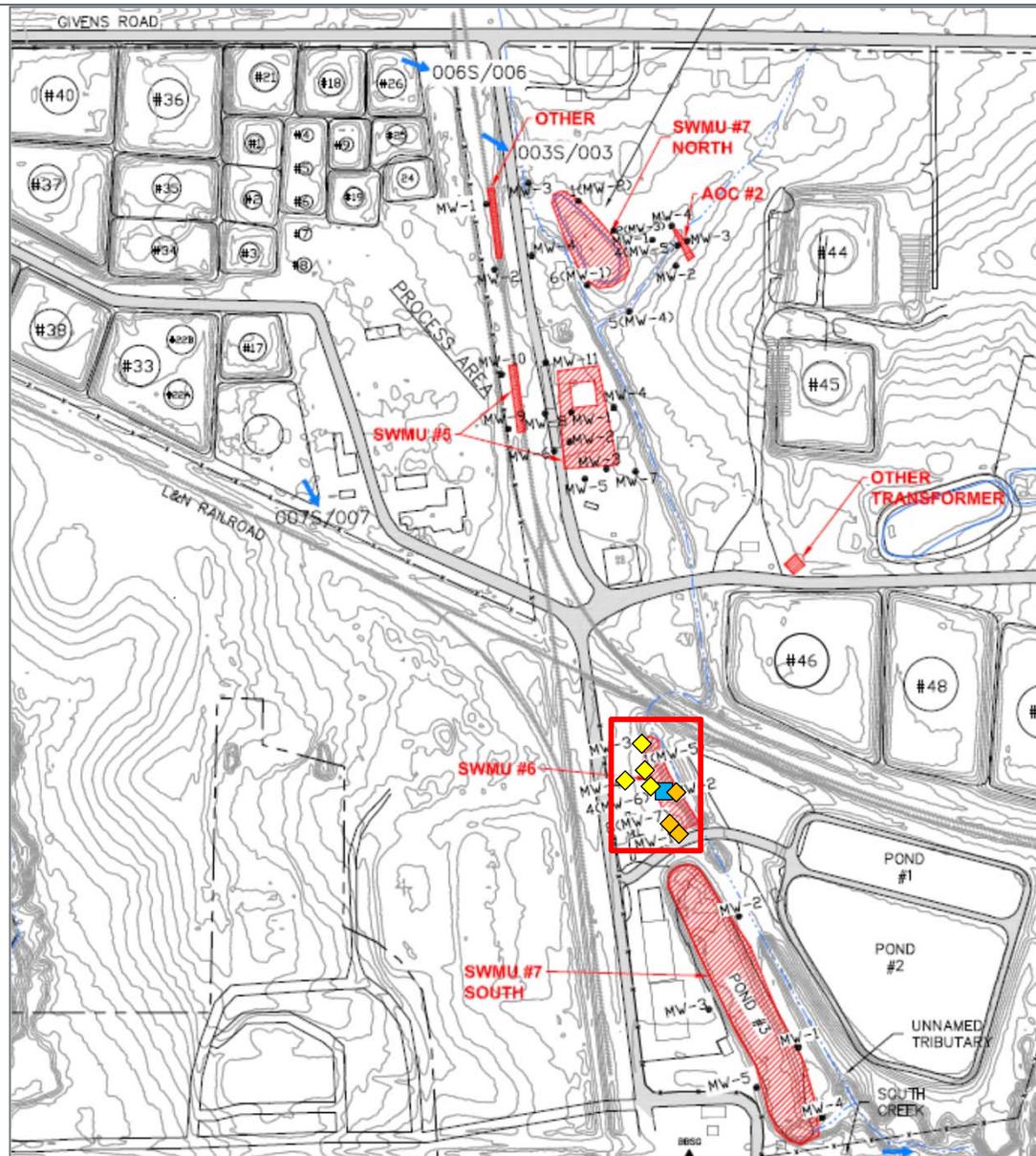
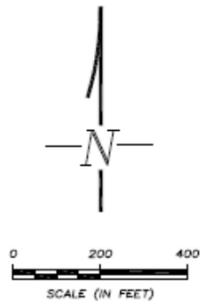
# SMWU 5 (east) Composite Soil Dataset (north)



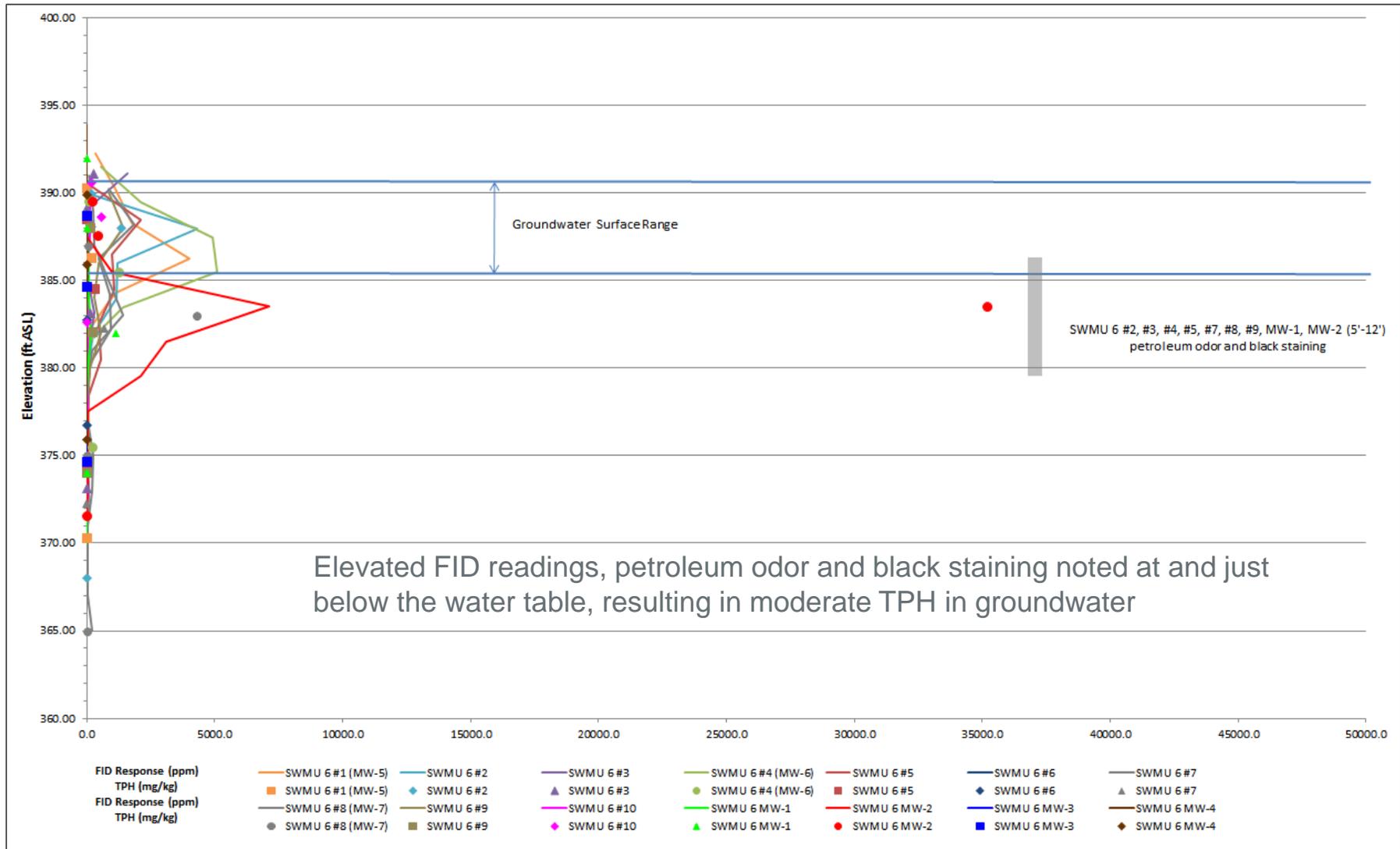
# SMWU 5 (east) Composite Soil Dataset (south)



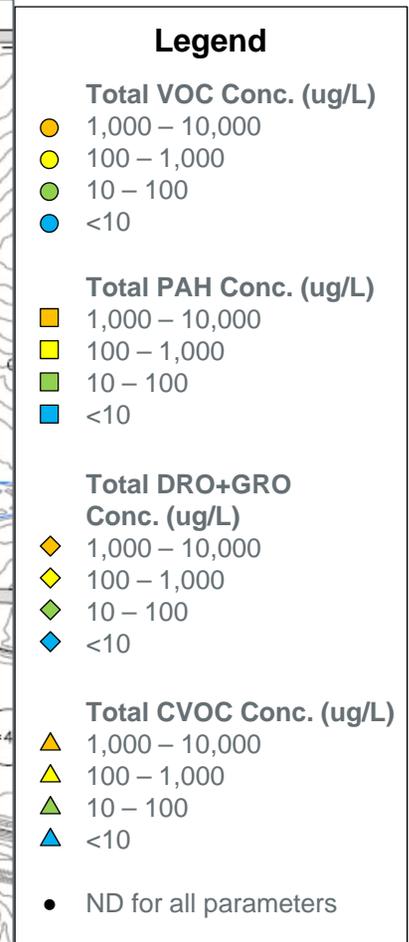
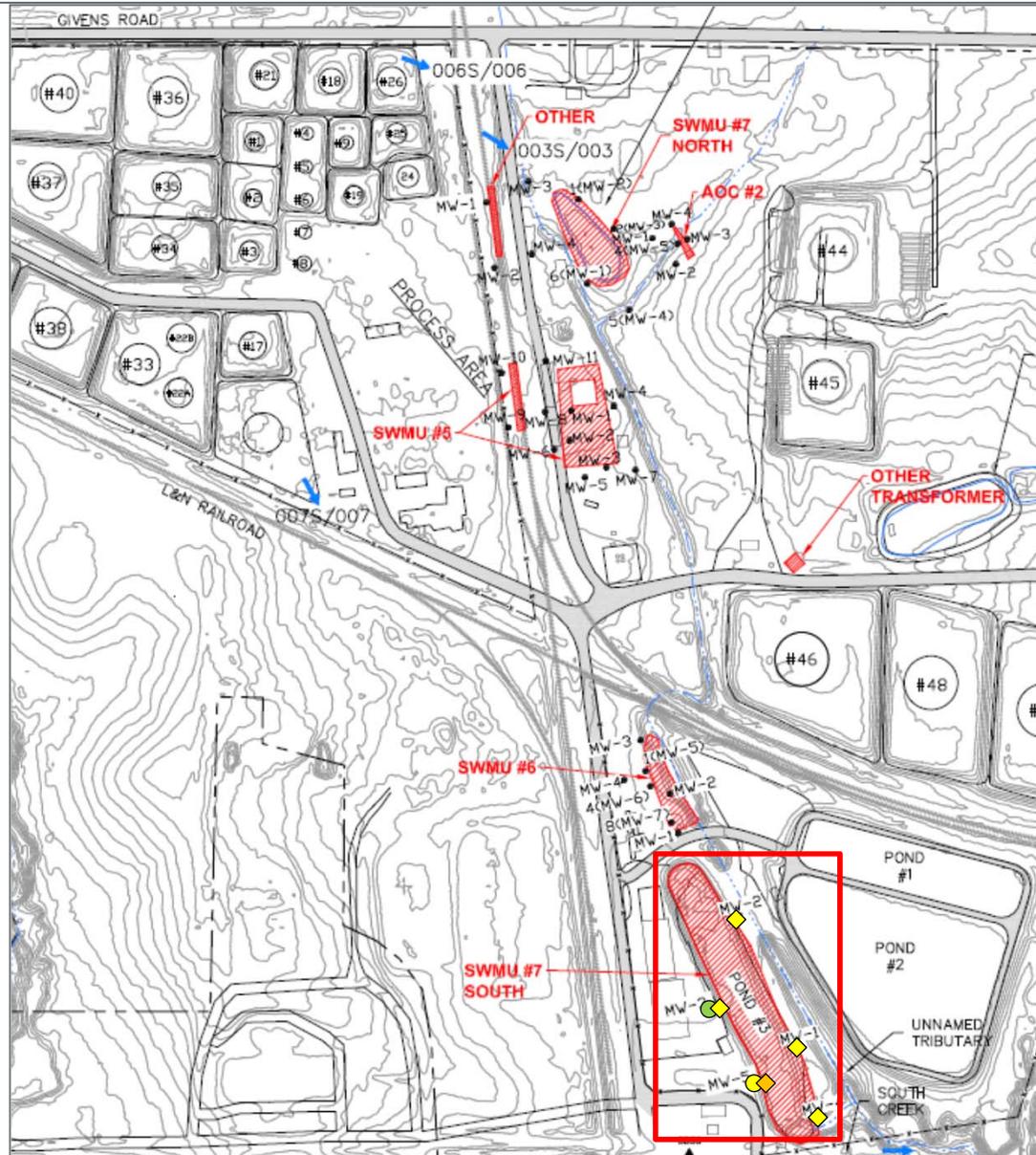
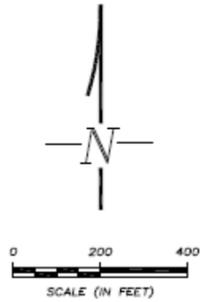
# Groundwater Contamination: SMWU 6



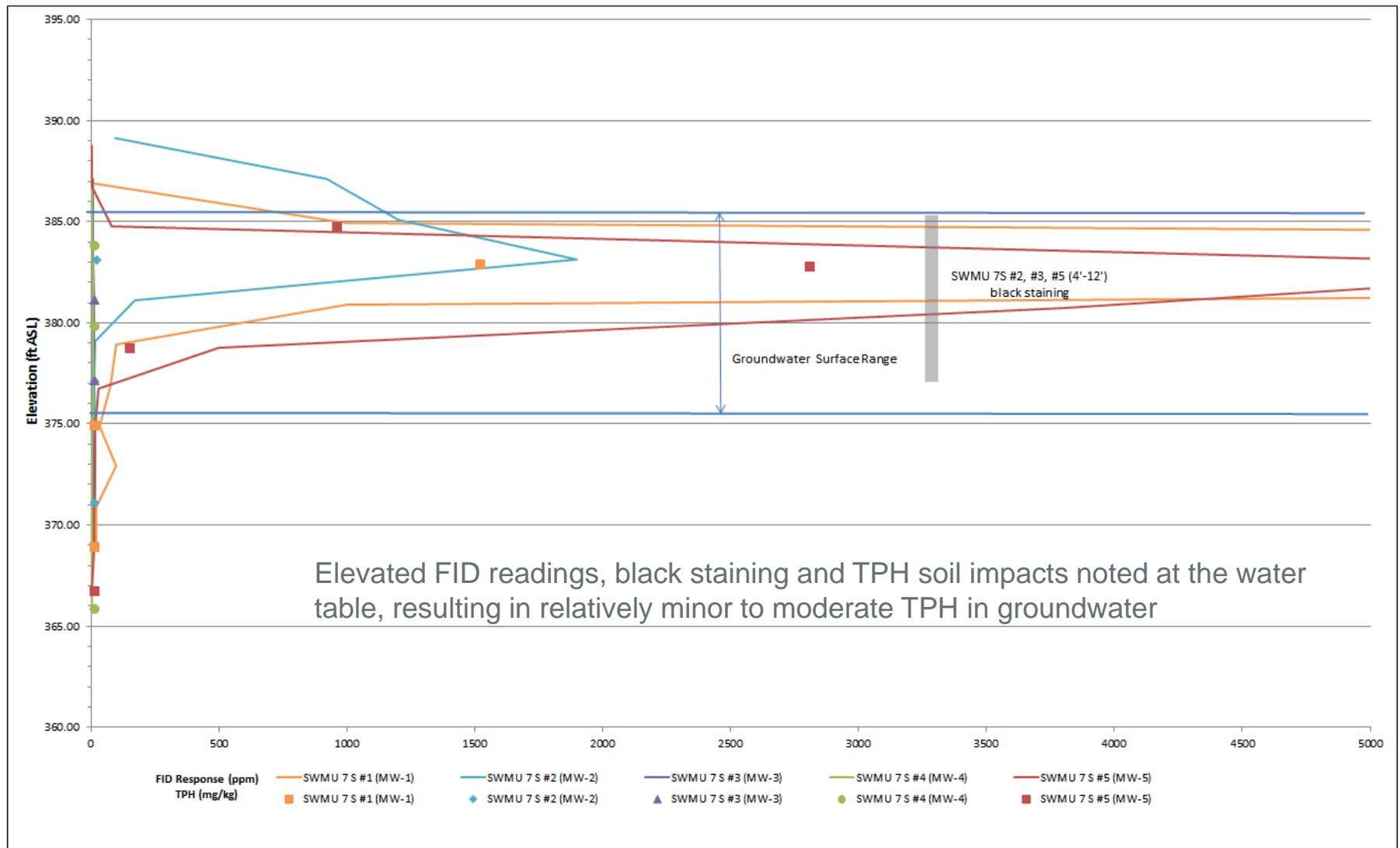
# SMWU 6 Composite Soil Dataset



# Groundwater Contamination: SMWU 7 South



# SMWU 7 South Composite Soil Dataset



# Conceptual Site Model Summary

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- Geology consists of low-permeability silts and clays overlying a reported sand layer, which overlies low-permeability bedrock
- Low-permeability silts and clays
  - Groundwater flow appears to mirror the ground surface topography
  - Groundwater flow velocities are likely very low
- Higher-permeability sand layer
  - Groundwater flow is expected to be to the south toward the Ohio River
  - Groundwater flow velocities are expected to be moderate
  - This geologic layer likely represents a preferential groundwater migration pathway

# Conceptual Site Model Summary

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- Elevated FID readings, black staining and petroleum odors identified in the vicinity of the water table in most SMWUs
- In general, significant TPH in soil identified at and above the water table
- Relatively low TPH identified in groundwater in most SMWUs
- Moderate TPH identified in groundwater downgradient of Other and SMWU 6, and possibly SMWU 5 (east)
- Minor localized VOC and PAH impacts to groundwater identified
- Minor CVOC impacts identified upgradient of SMWU5 (west), likely emanating from production area

# Next Steps

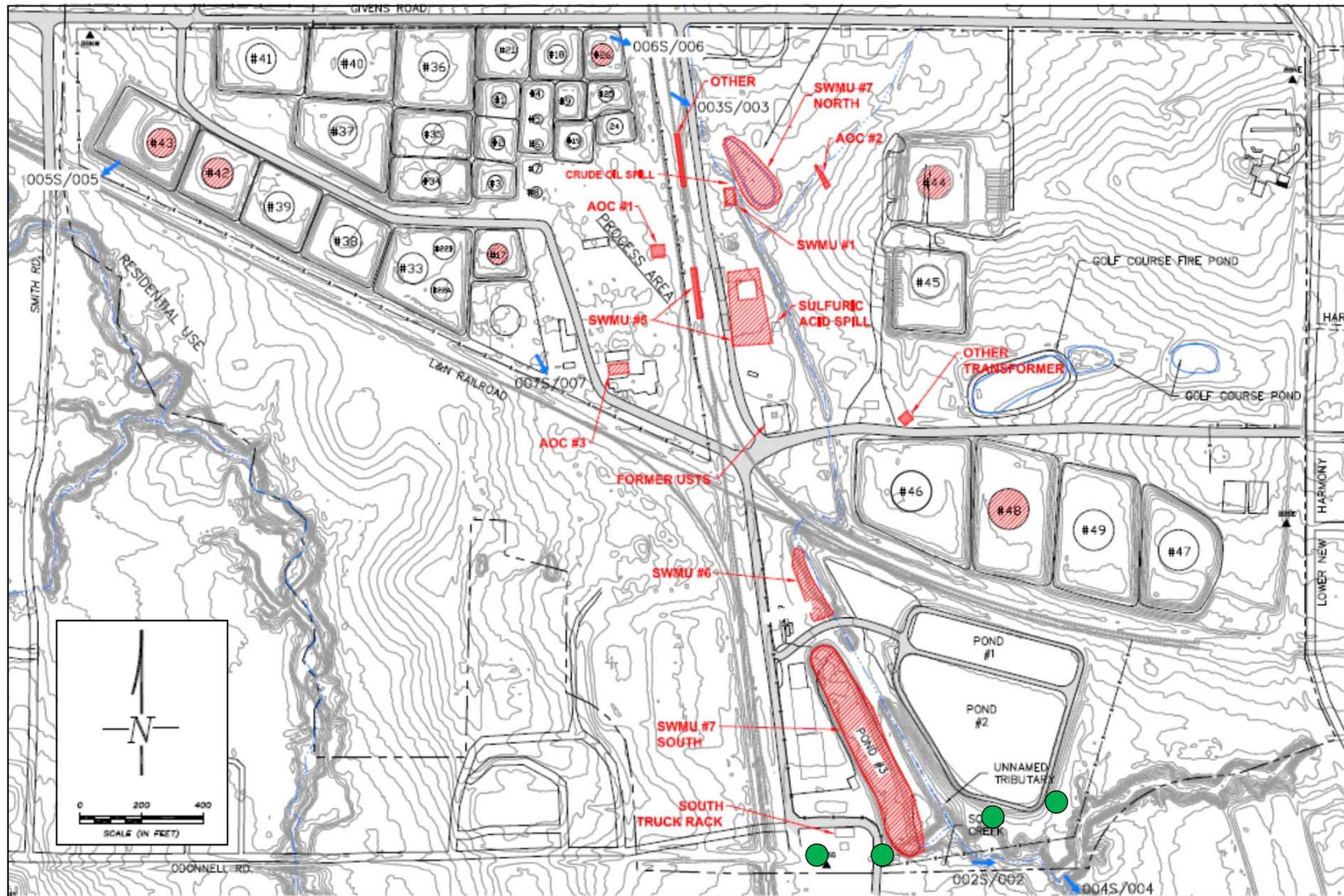
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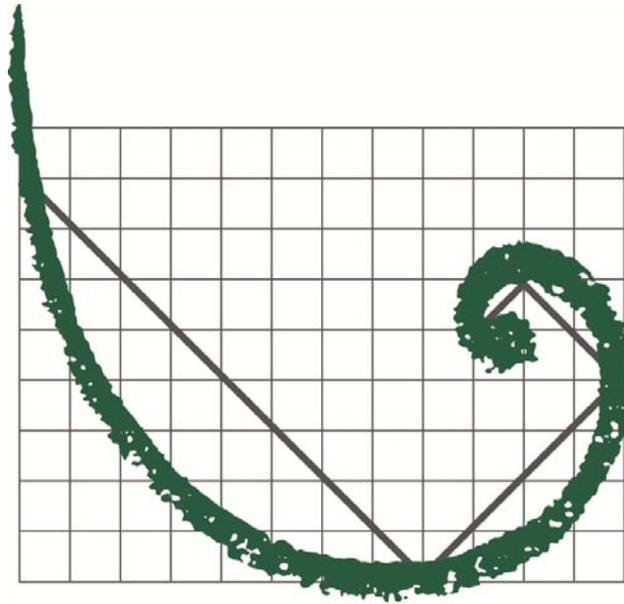
Conduct Waterloo<sup>APS</sup> program along downgradient site boundary to

- Refine understanding of site geology and hydrogeology
- Evaluate presence of dissolved-phase plumes that could migrate off site

Develop strategic plan to efficiently complete site characterization activities

# Proposed Waterloo<sup>APS</sup> Program





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