



# River Raisin Area of Concern

## Post-Interim Cover Investigations



Presented by  
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# Discussion Topics

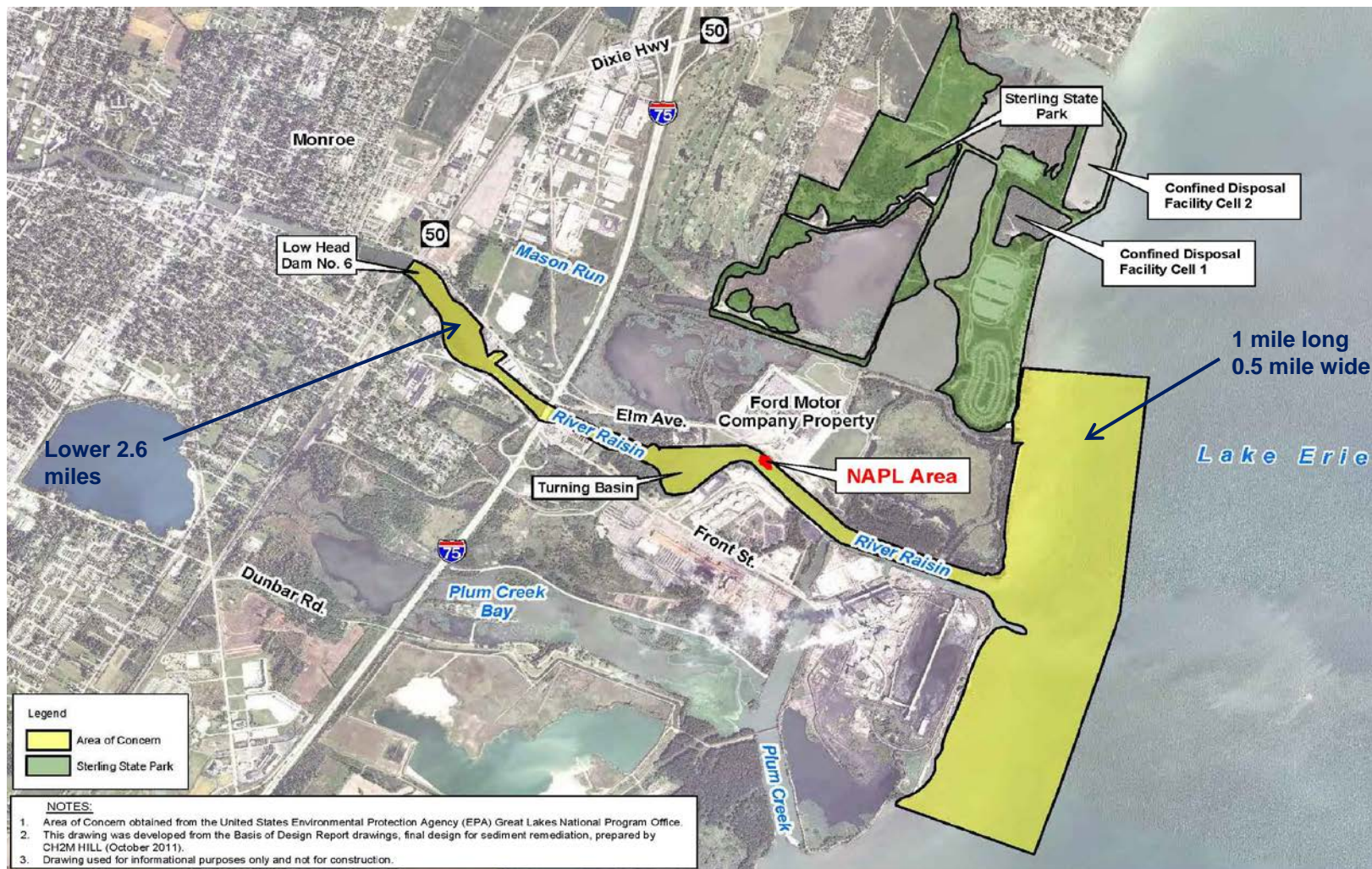
- Project Team
- Area of Concern (AOC) Description
- Non-Aqueous Phase Liquid (NAPL) Area Description
- Interim Cover
- Supplemental Investigation Scope and Results
- Remaining Tasks

# Project Team

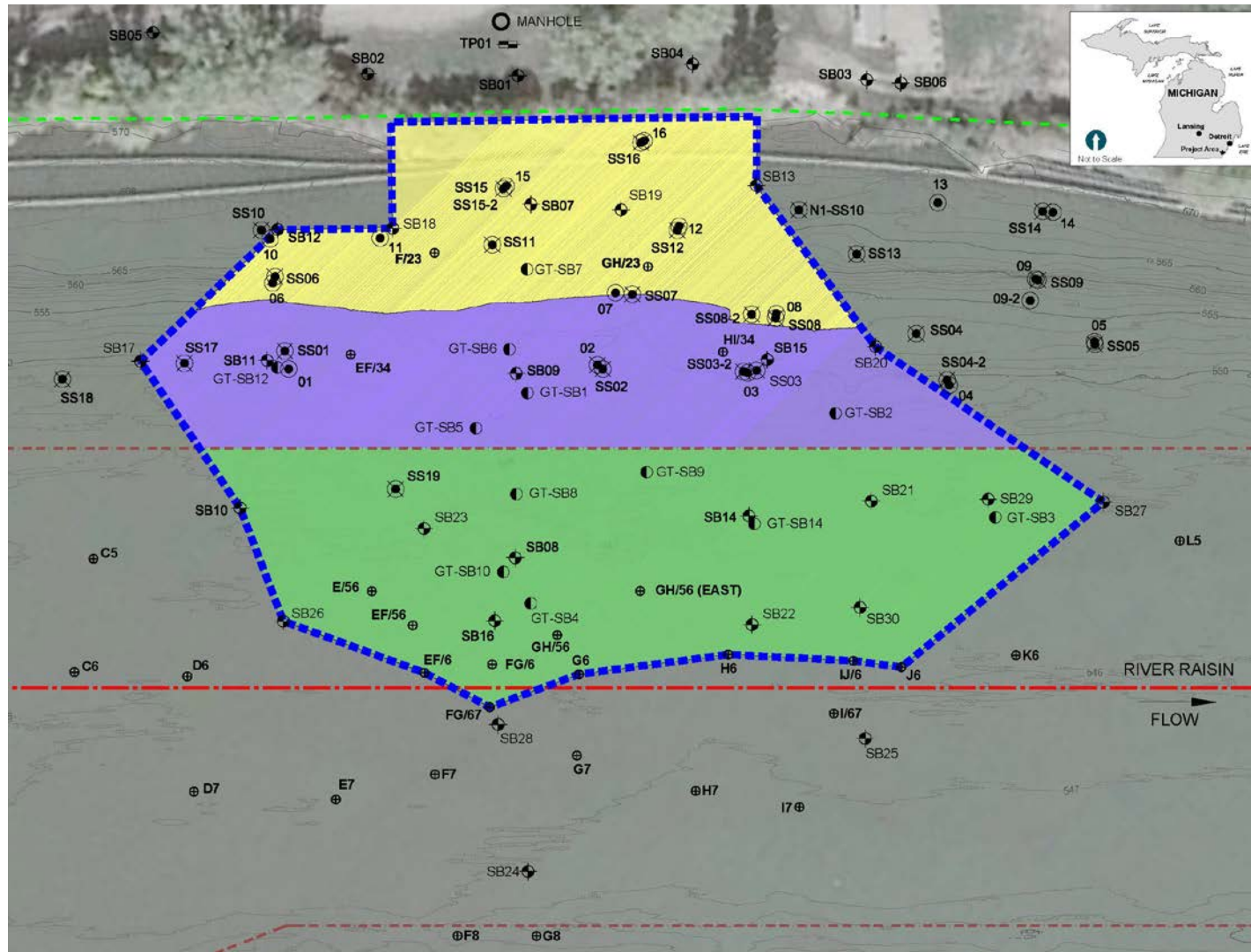
- Throughout this evaluation, extensive collaboration and discussion occurred between
  - Great Lakes National Program Office
  - Toxic Substances Control Act Division
  - Michigan Department of Environmental Quality
  - Ford Motor Company



# Area of Concern



# NAPL Area





## NAPL Area (cont.)

- PCBs and NAPL present
- Water depth in channel approximately 25 feet
- Dredging projects implemented in 1997 (Ford) and 2012 (Project Partners GLNPO, MDEQ, and Ford)
- Interim cover installed in 2012
- Initial delineation of NAPL performed in 2012
- Additional investigations in 2013 and 2014

# NAPL Area (cont.)

- 2013 and 2014 Investigations included:
  - PCB sampling and analysis
  - Surface water/groundwater temperature monitoring
  - Seepage meter monitoring
  - Porewater PCB sampling
  - Geotechnical analysis/cross-hole seismic evaluation
  - NAPL mobility testing
    - Water drive
    - Centrifuge

# PCB Sediment Results

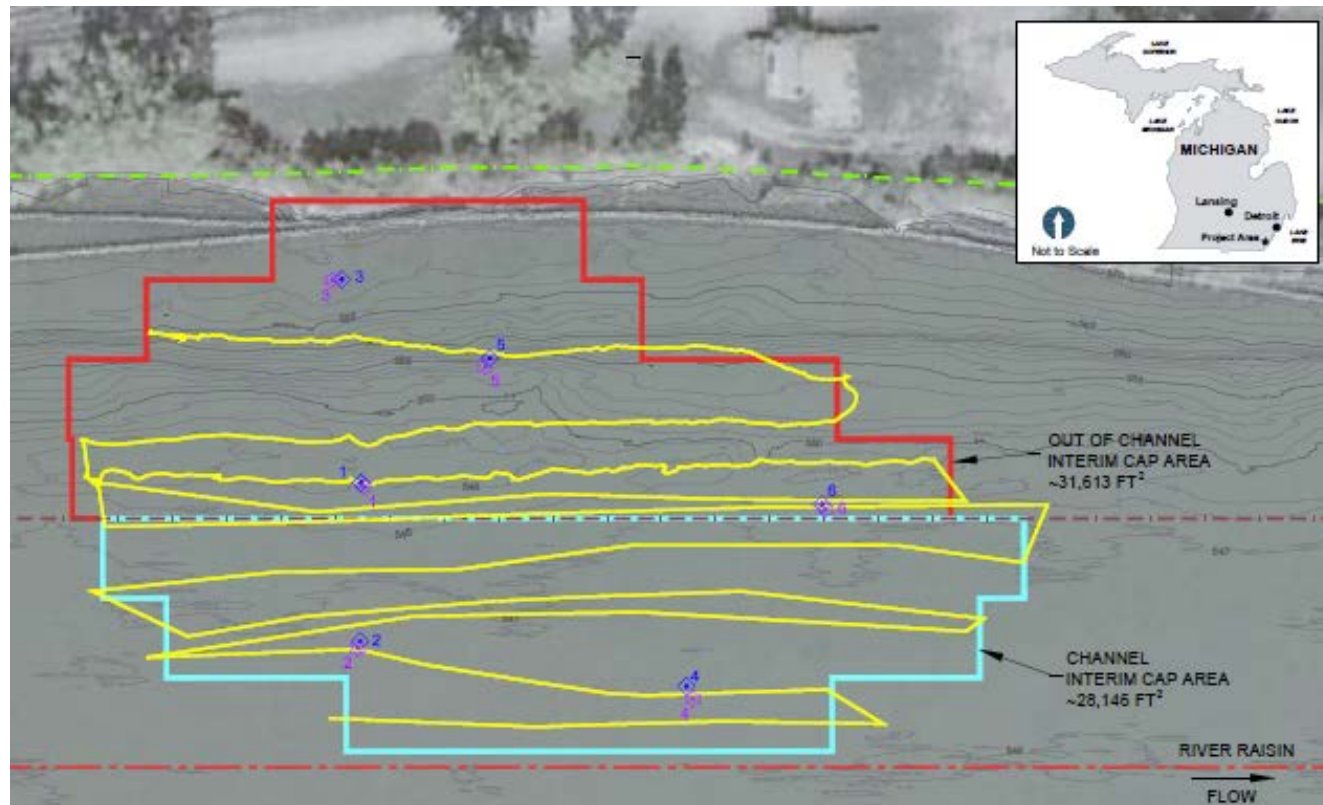


- Stiff glacial till throughout
- Extensive historical AOC dataset
- 689 PCB samples analyzed from 107 locations
- Maximum PCB concentration is 75,000 ppm (surface sample)
- PCBs greater than 50 ppm at depths greater than 28 feet bss
- NAPL observed up to 24 feet bss



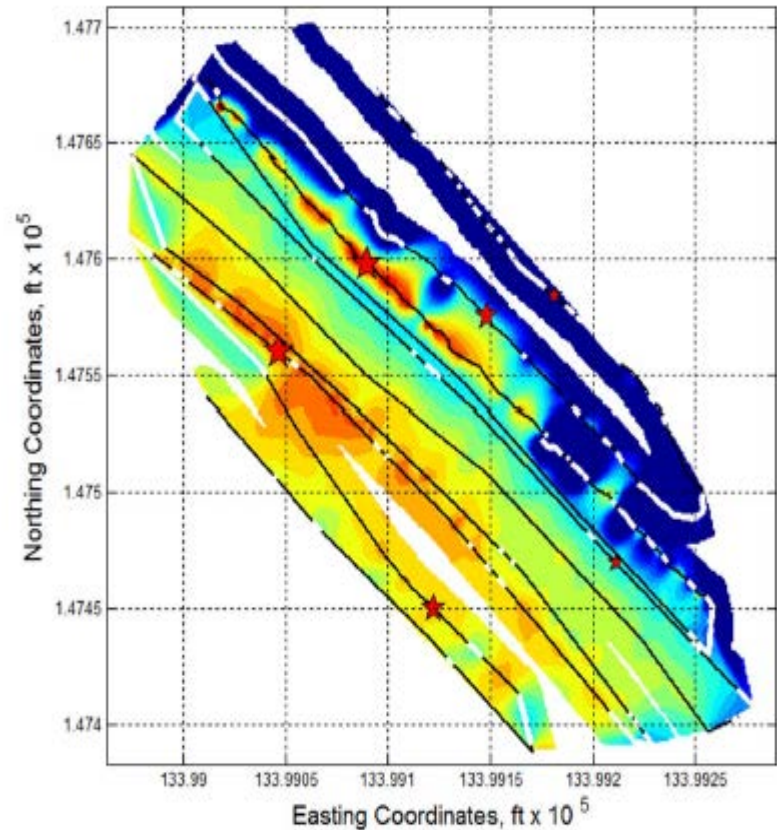
# Porewater Temperature Monitoring

- Buried fiber optic cable installed by divers
- Identified potentially high and low seepage areas



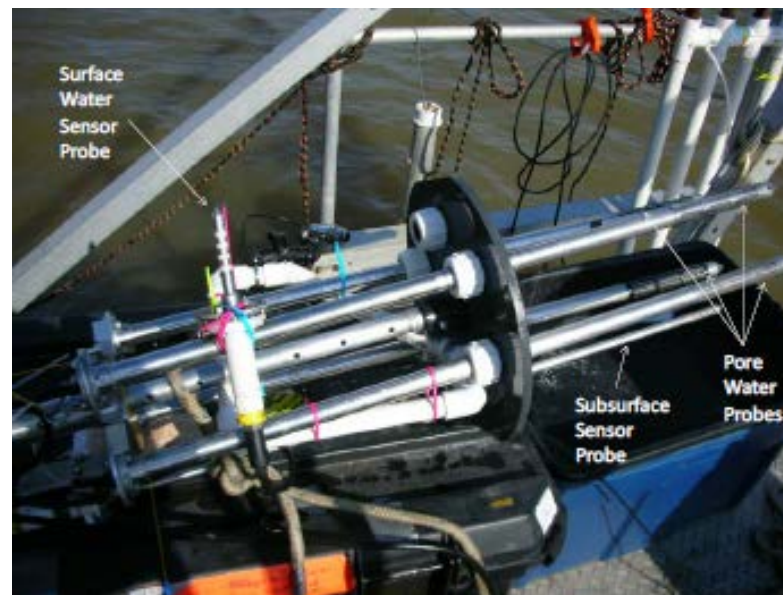
# Seepage Monitoring

- Seepage meters at 6 locations
  - Two at high temperature differences
  - Two at low
  - One at moderate
  - One at unknown (cable could not be installed)
- Values ranged from 0.16 to 1.69 cm/day (0.86 cm/day average)
- Good coloration between fiber optic and seepage meter results



# Porewater Sampling

- Six locations co-located with seepage meters
- Filtered and unfiltered samples collected with Trident Probe
- Filtered range: 1 to 88  $\mu\text{g/L}$  (17  $\mu\text{g/L}$  average)
- Unfiltered range: 1 to 105  $\mu\text{g/L}$  (20  $\mu\text{g/L}$  average)
- Highest PCB concentration observed at lowest seepage rate location
- Porewater and seepage meter data combined to determine net PCB flux through the NAPL Area





# Boring Installations





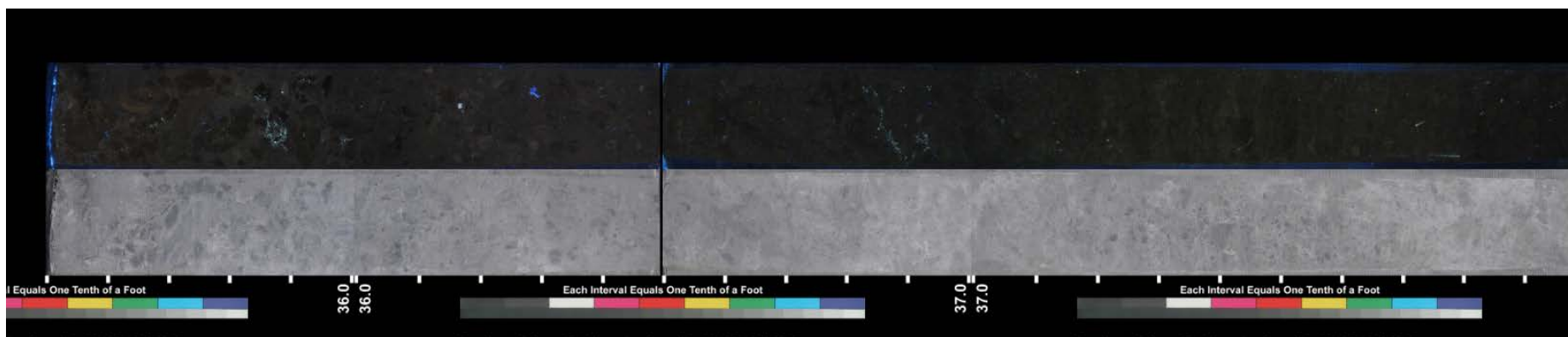
# Geotechnical Results

- Twelve locations
- Rotosonic drilling
  - Stiff glacial till observed
- Primarily clay, silt, sand, and some gravel
- Cross-hole seismic and geotechnical data
  - Subsurface materials consistent with glacial till or weathered rock
  - Material “rippable” but difficult to remove



# NAPL Mobility Testing

- Samples collected in 2012 and 2013
- Samples collected from most visually impacted locations/depths
- Water drive test – 25 pounds per square inch
- Centrifuge test – 1,000 times gravity
- NAPL is immobile under pressures that are higher than normal environmental conditions

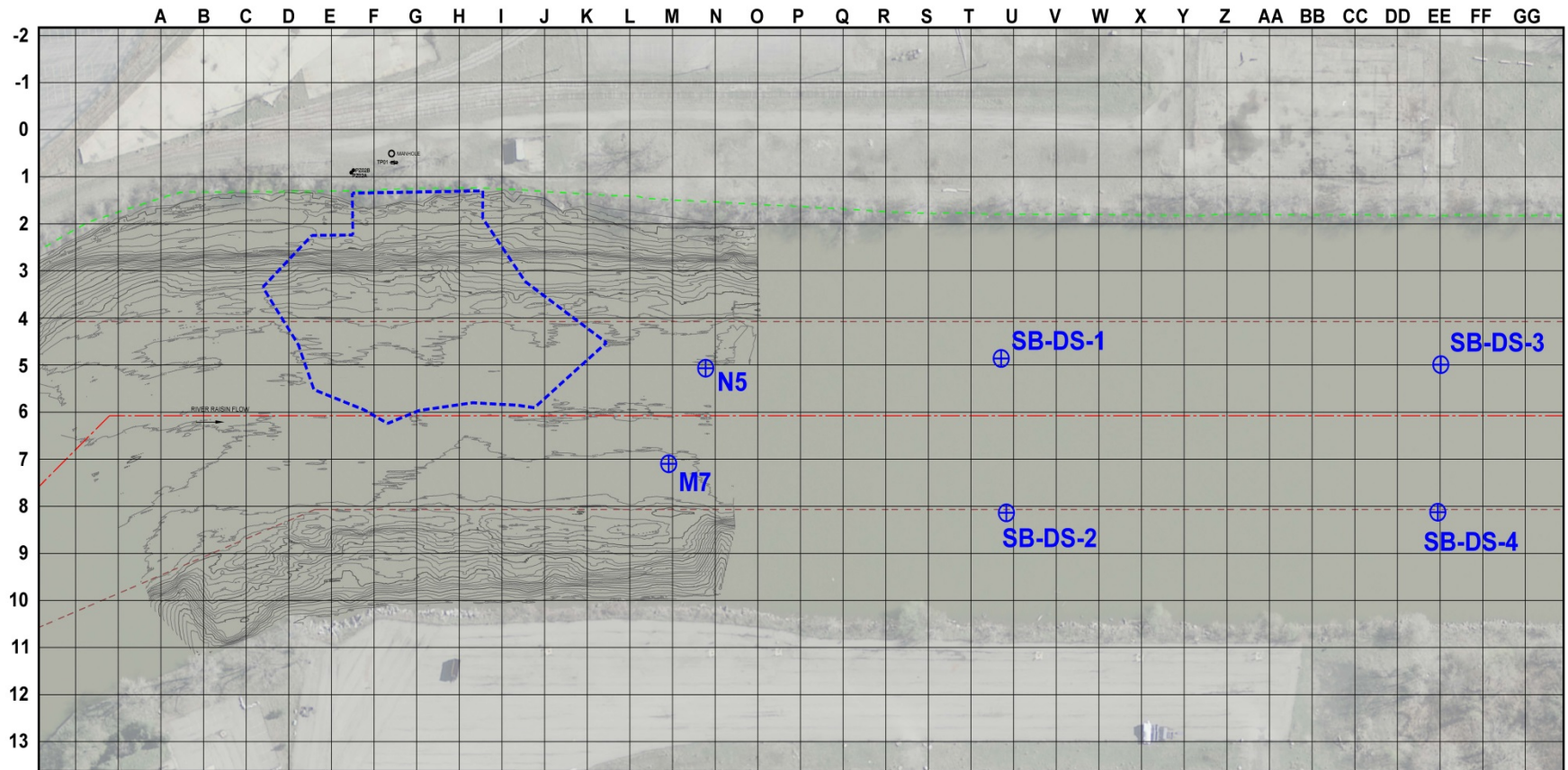


# Downstream Investigation Results in 2014

- Six coring locations
- Each location advanced to 12 ft bss
- Continuous PCB sampling in 2-foot increments
  - 100 feet downstream from the NAPL Area at Locations M7 and N5 ranged from non-detect to 0.84 ppm
  - 450 feet downstream from the NAPL Area at Locations DS-1 and DS-2 ranged from non-detect to 0.30 ppm
  - 975 feet downstream from the NAPL Area at Locations DS-3 and DS-4 ranged from non-detect to 0.13 ppm

# Supplemental Investigation Results

- Downstream





# Remaining Tasks

- Finalize remedy
- Final design details/permitting
- Construction contracting
- Implementation – likely 2016
- Long-term monitoring and maintenance

# Questions/Discussion

