Former Hercules Facility
Hattiesburg, Mississippi

February 4, 2021

Agenda

1 Introduction & Objectives

2 Site management strategy

3 Timeline and next steps

4 Conceptual site model and follow up investigations

5 Baseline risk assessment update

6 Remedial action

7 Open discussion

Introductions

USEPA:

- Graham Burkhalter
- Colleen Michuda
- Stacey Haire
- Sandra Harrigan
- Maher Budeir
- Kathy Schroer
- David Egetter
- Tim Frederick

MDEQ:

- Hunter Hudson
- Thomas Wallace
- Lisa Ouzts

Hercules/Ashland:

- Tim Hassett
- Robin Lampkin

Beveridge and Diamond:

- Bryan Moore

Arcadis:

- Jason Hughes
- Brian Burke
- Antonio Cardoso

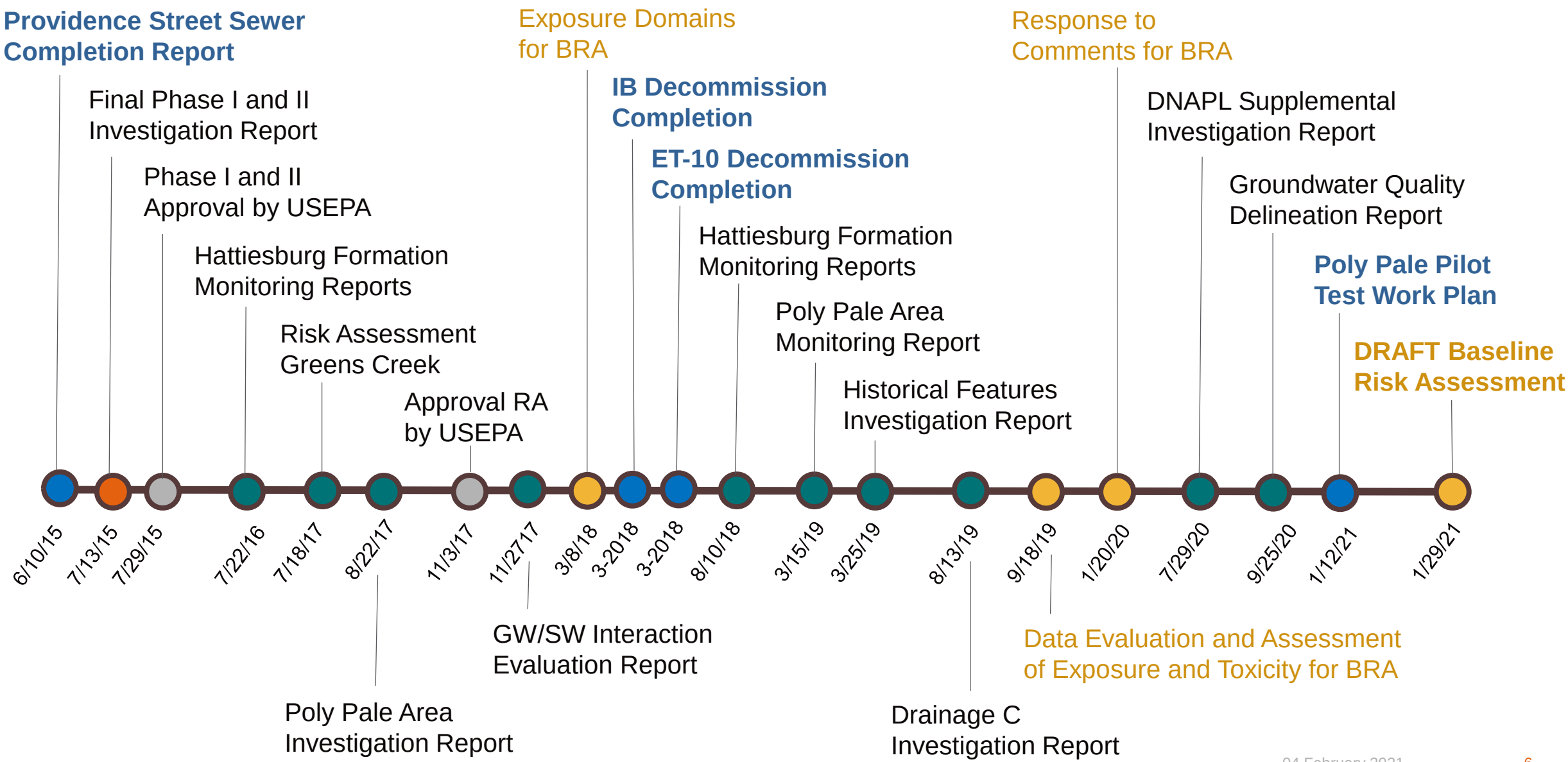
Objectives

- Provide update of site activities completed in compliance with USEPA and MDEQ Orders and directives:
  - Investigations and Remedial Measures
  - Reporting
  - Baseline Risk Assessment
  - Routine compliance monitoring
- Path forward

Site Management Strategy

- Complete work as required by USEPA RCRA 3013(a) and 3008(h) Orders
- Maintain compliance with 2008 MDEQ RUAO
- Protect human health and environment through risk management strategies
- Position the site for commercial/industrial reuse (consistent with the RUAO)
- Proactively address areas of interest
- Maintain working relationship with stakeholders
- Execute projects safely and efficiently
- Work with USEPA and MDEQ community relations staff for public participation

Timeline (June 2015 – Present)

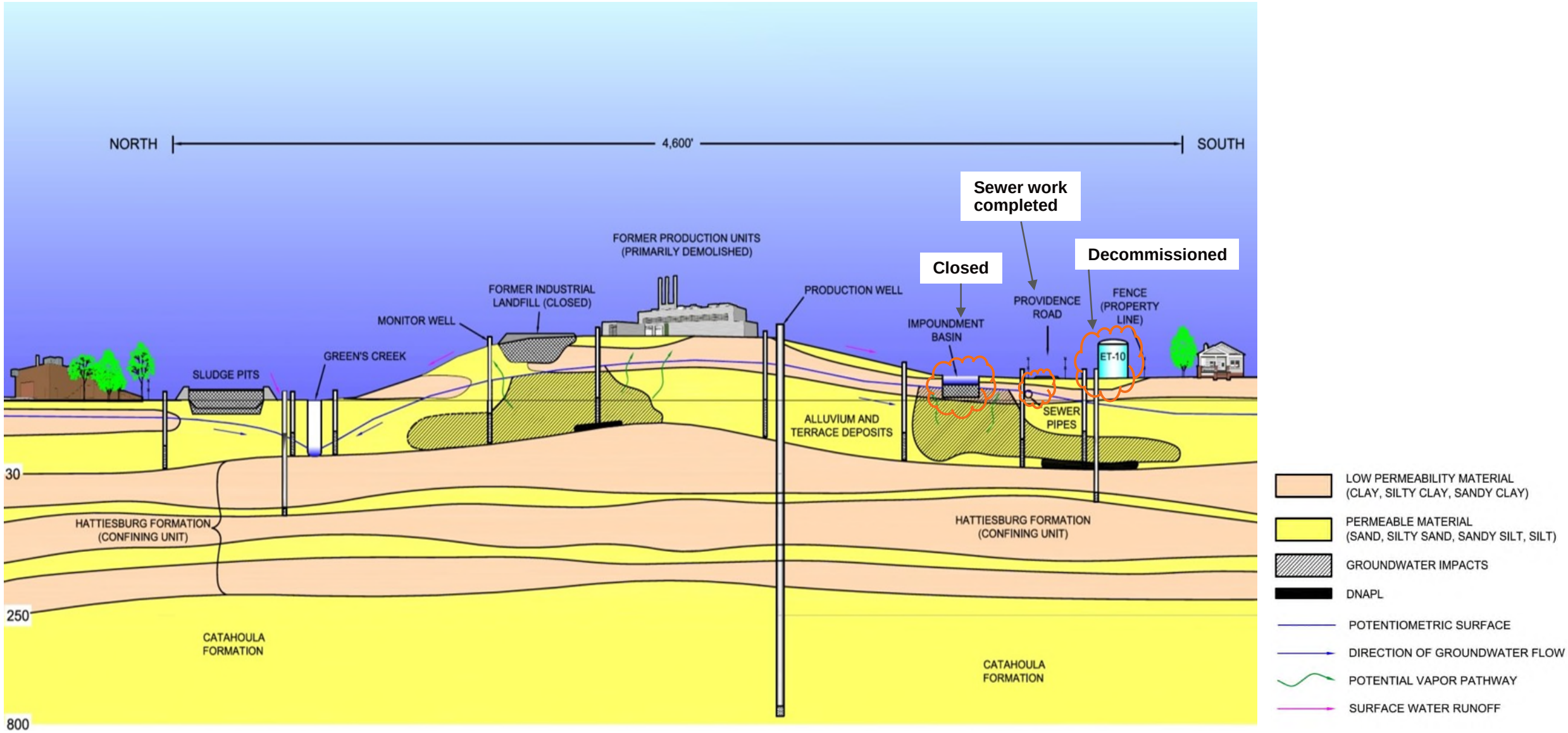


Next Steps

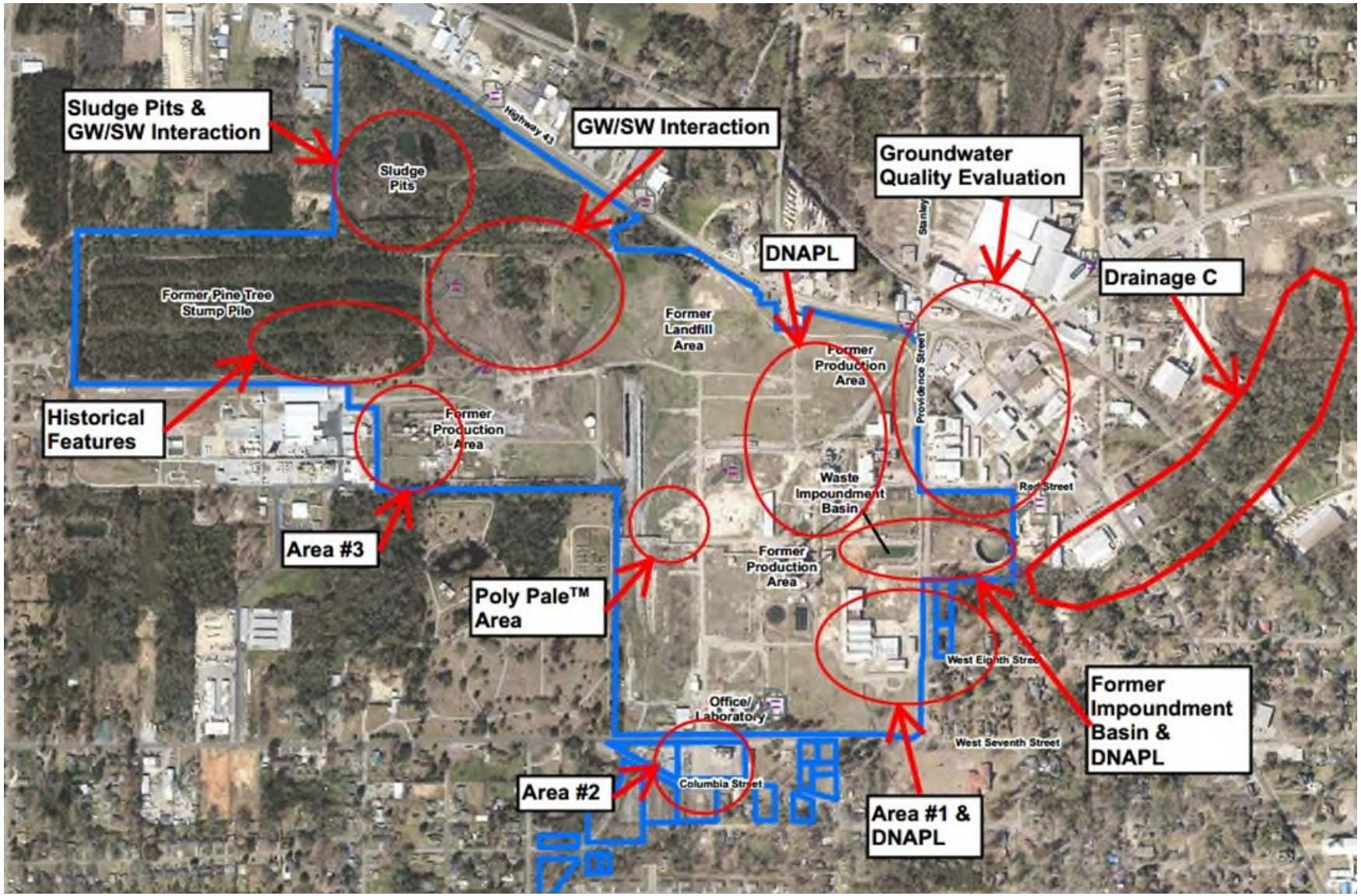
- Evaluate source reduction/limit mass flux within focused areas:
  - Poly Pale™ Area remediation (soil, groundwater, DNAPL) using AS/SVE
  - Potential to expand AS/SVE to other areas (e.g., former IB area, northeast property boundary)
  - In-situ treatment for 1,4-dioxane (e.g., former landfill area)
  - Thermal enhancement treatment (e.g., former Delnav unit area)
- Consolidation, stabilization and capping of Sludge Pits
- Confirmatory sampling for total dioxathion to demonstrate data generated before 2018 may not accurately represent total dioxathion concentrations in the samples
- Expansion of current land and groundwater use restrictions to areas not covered by the RUAO/Notice of Land Use Restrictions
- Development of Soil Management Plan and other control measures for potential exposure pathways

Conceptual Site Model and Follow Up Investigations

Conceptual Site Model

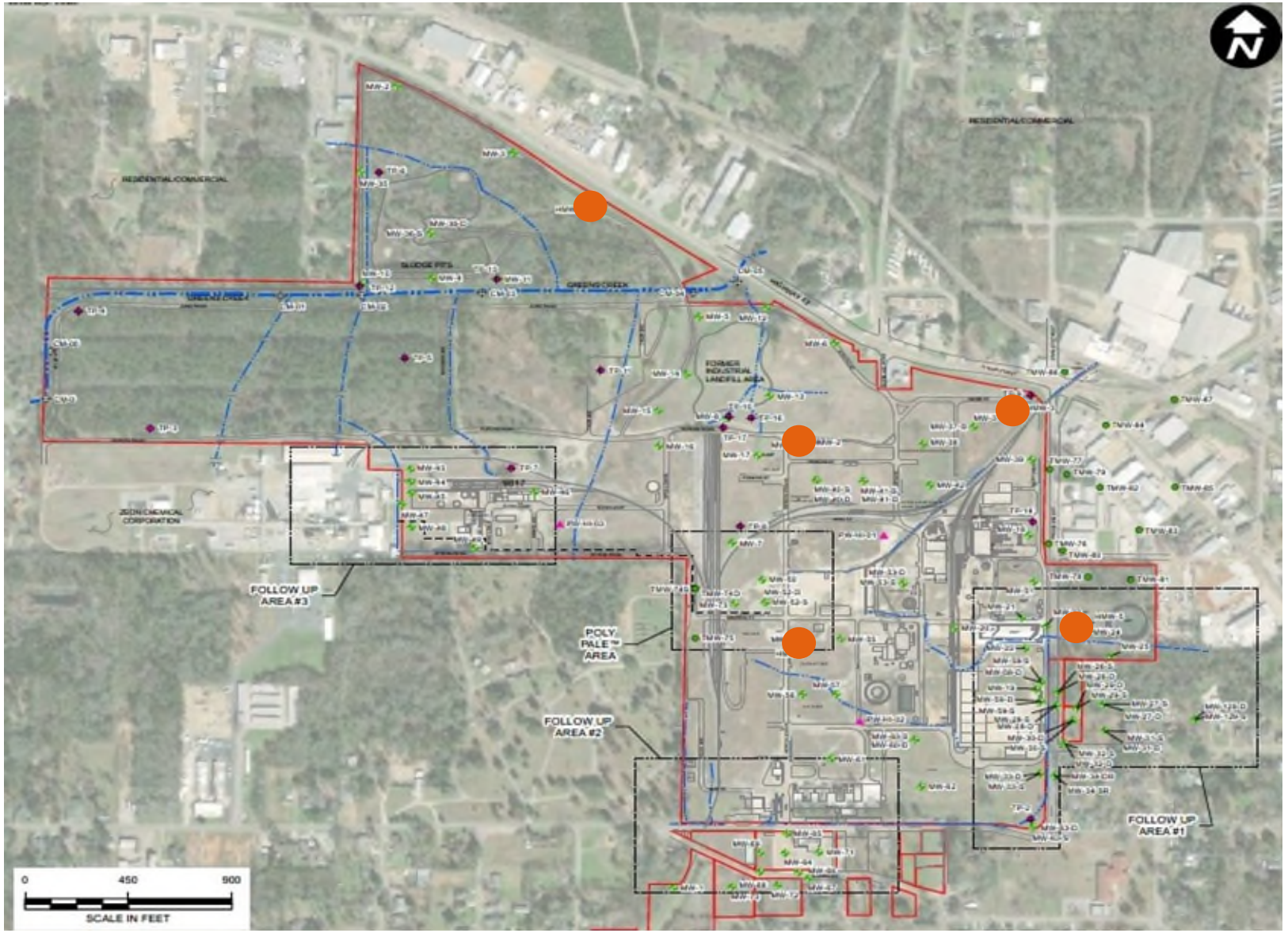


Follow Up Investigations



- Follow up investigations completed 2015 - 2020
- Ongoing semiannual monitoring (RUAO and specific areas)

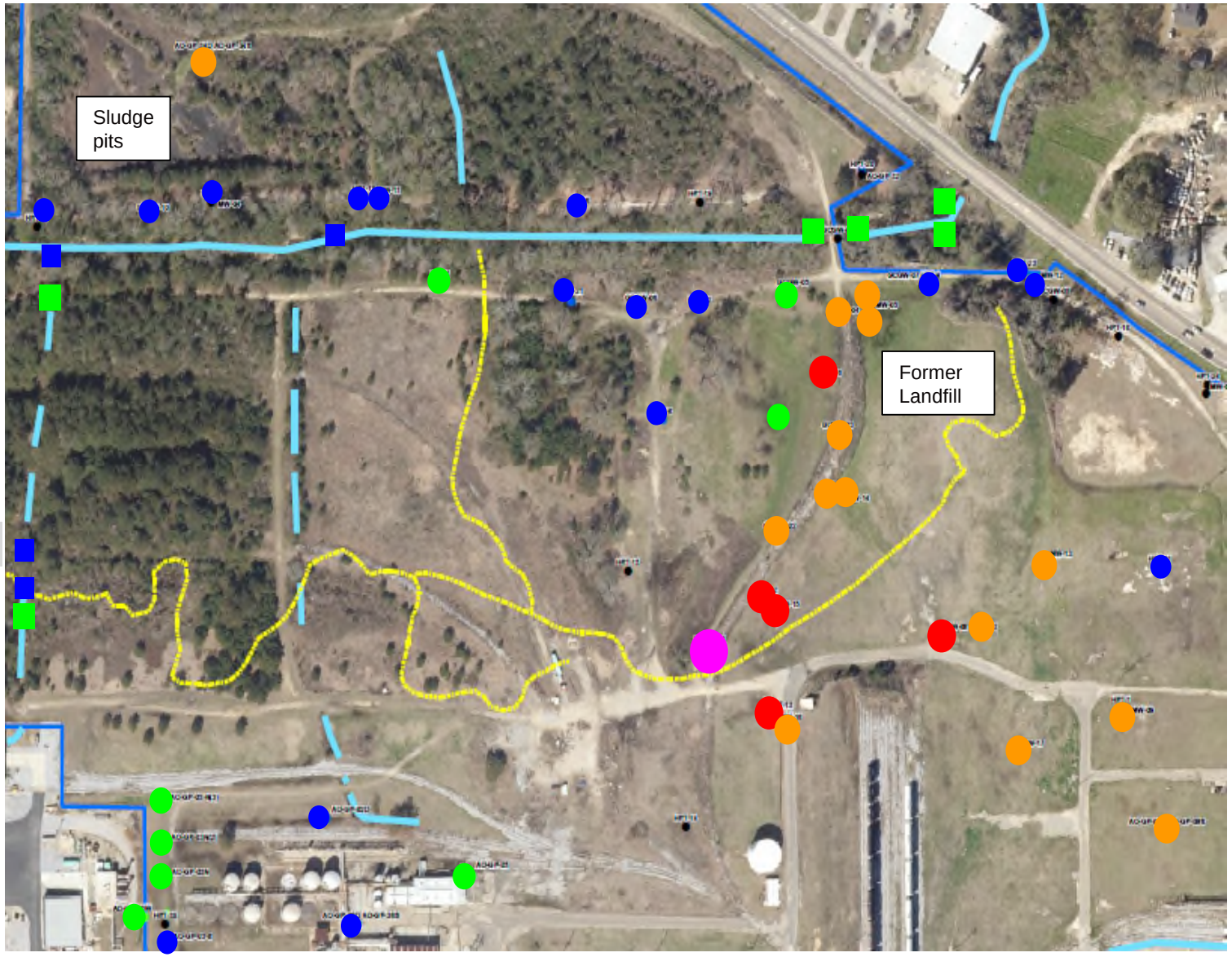
Hattiesburg Formation Monitoring Wells



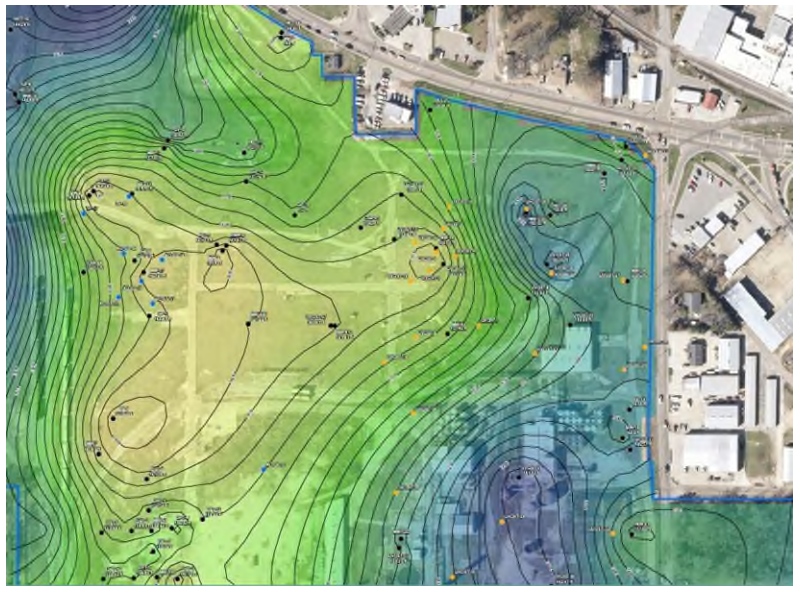
- **Data indicate no vertical migration from alluvial aquifer to Hattiesburg Formation**
- Data indicate no vertical migration to Catahoula Formation (Hattiesburg Formation provides protection against future migration)
- Ongoing annual groundwater quality monitoring within Hattiesburg Formation to demonstrate continued compliance

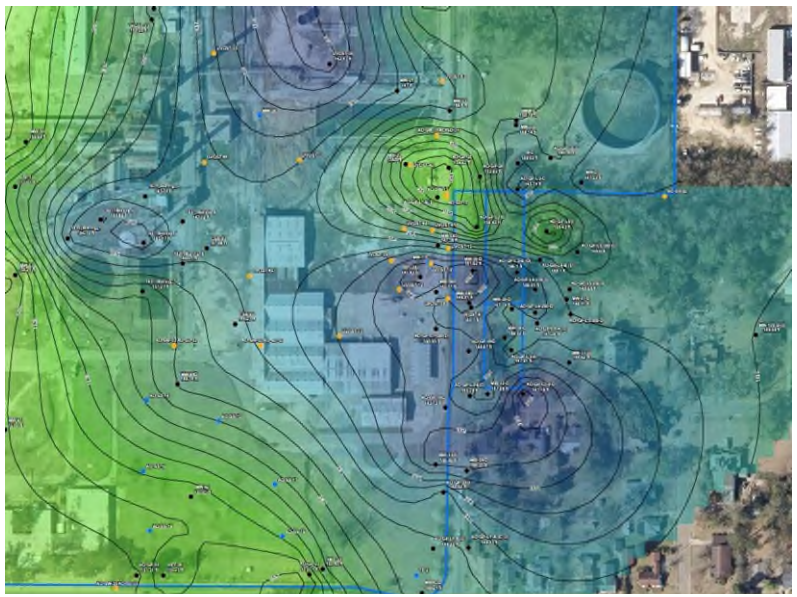
Groundwater/Surface Water Interactions

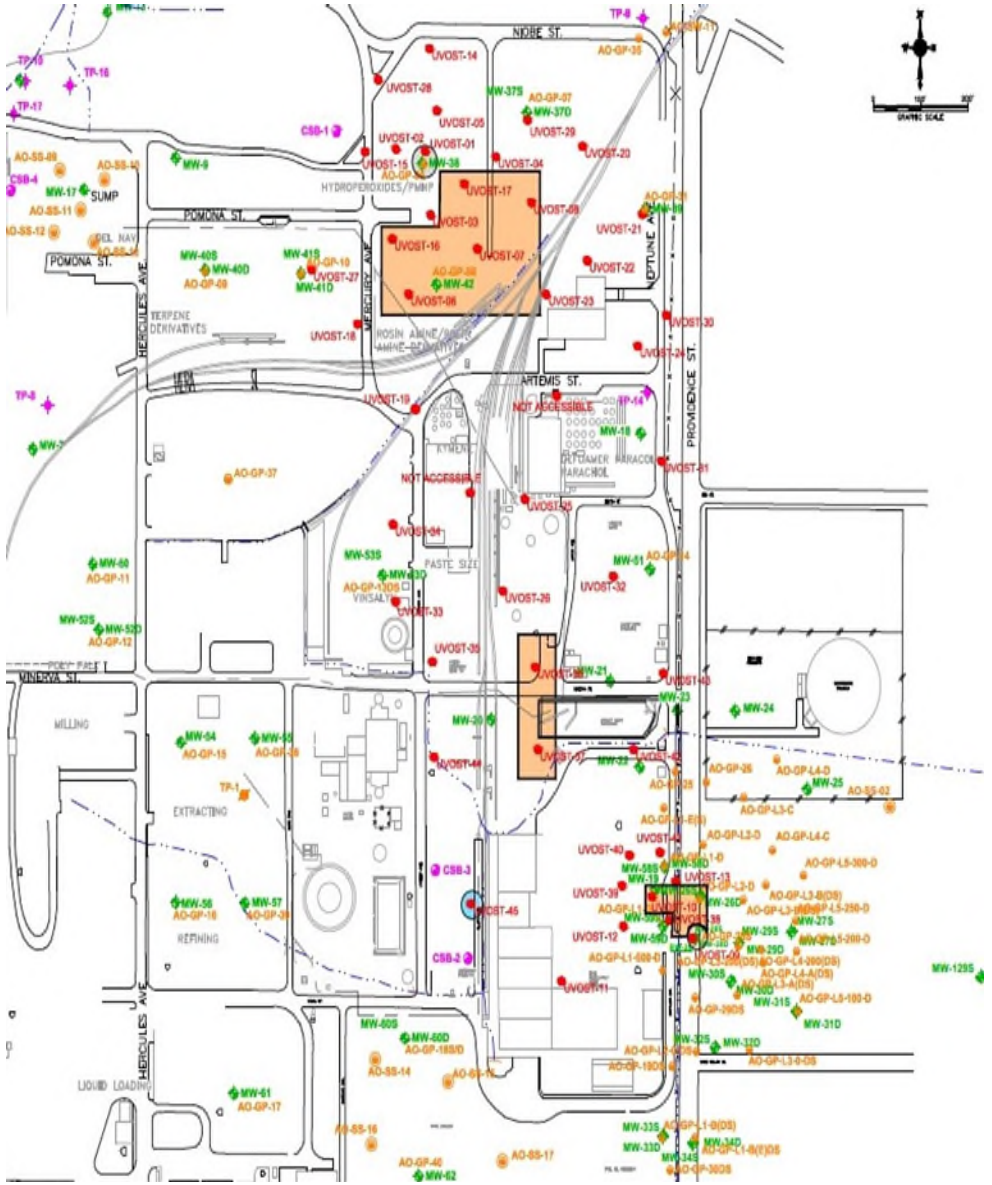
- **No unacceptable risk in Greens Creek (HHRA and ERA)**
- Multiple lines of evidence for site characterization: HPT, VAP, PFM, GW/SW sampling
- Potential 1,4-dioxane discharge in narrow stretch along southern bank
- Limited contribution from Sludge Pits area



Dense Non-Aqueous Phase Liquid Investigation

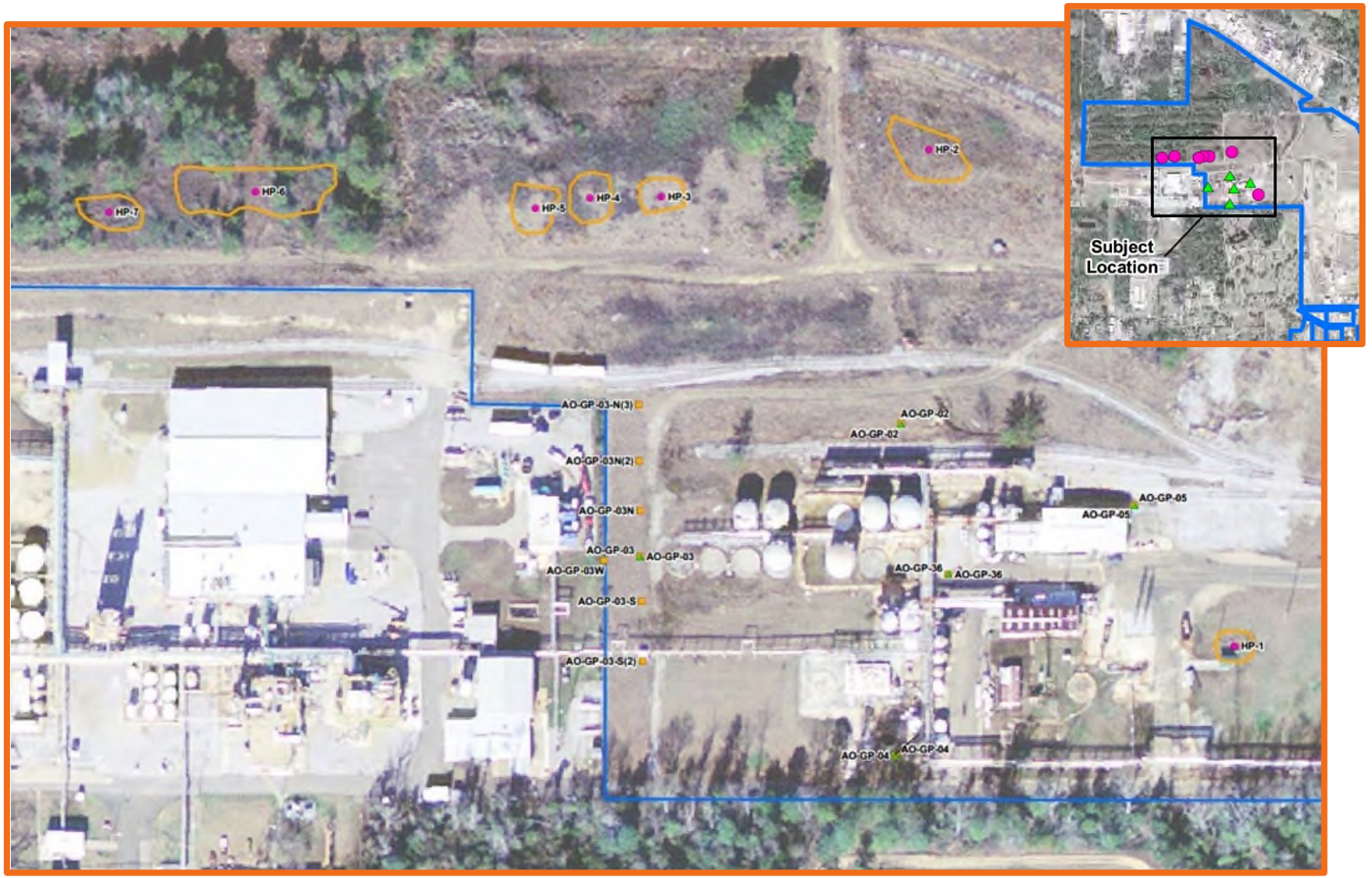






- **Limited accumulation on low points on top of clay structure; relatively immobile; unlikely to migrate**
- Multiple lines of evidence: UVOST, dye test, visual, PID, recoverability tests, and soil and GW sampling
- Ongoing semiannual gauging and DNAPL removal to confirm Conceptual Site Model and provide mass reduction

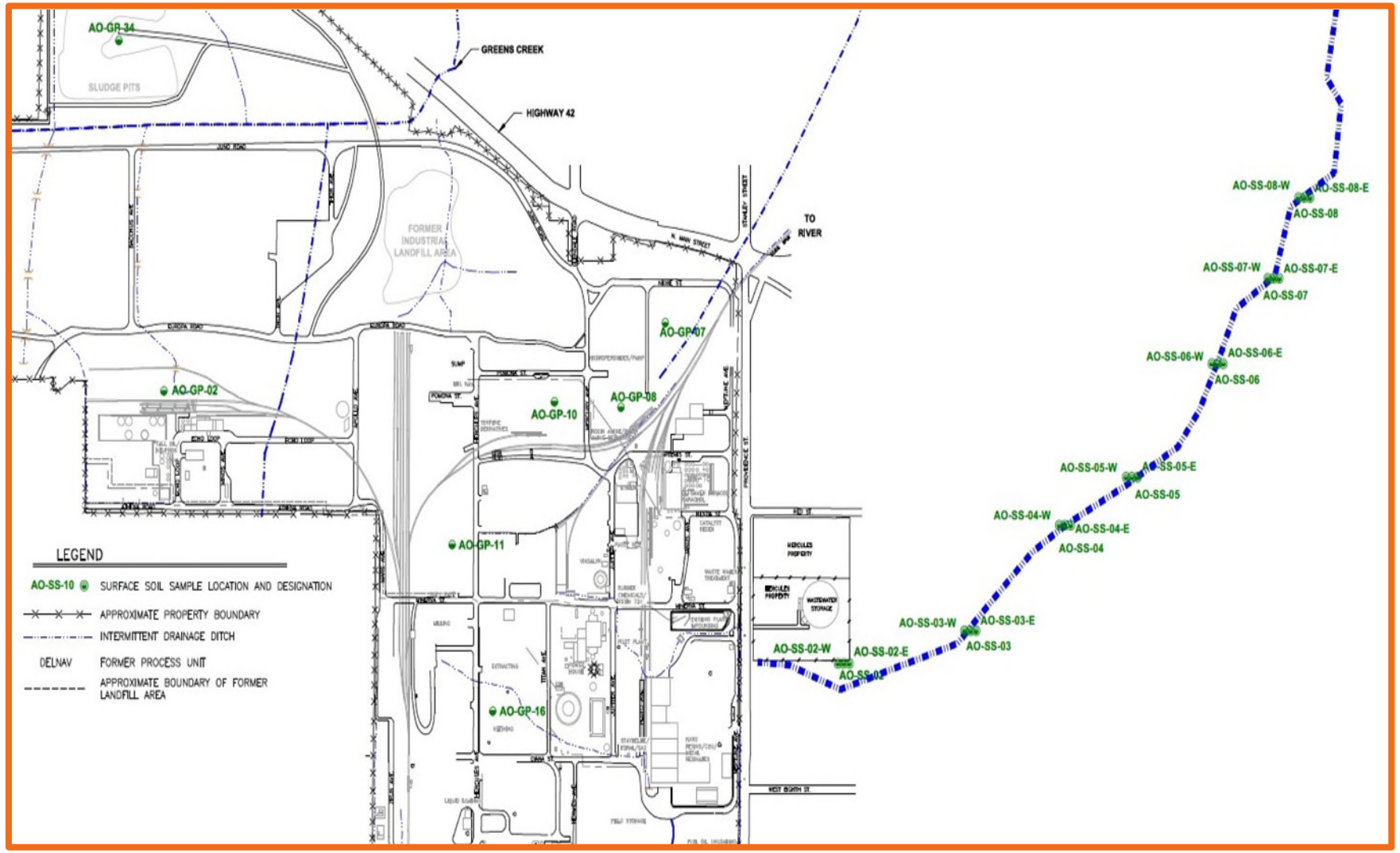
Historical Features Investigation



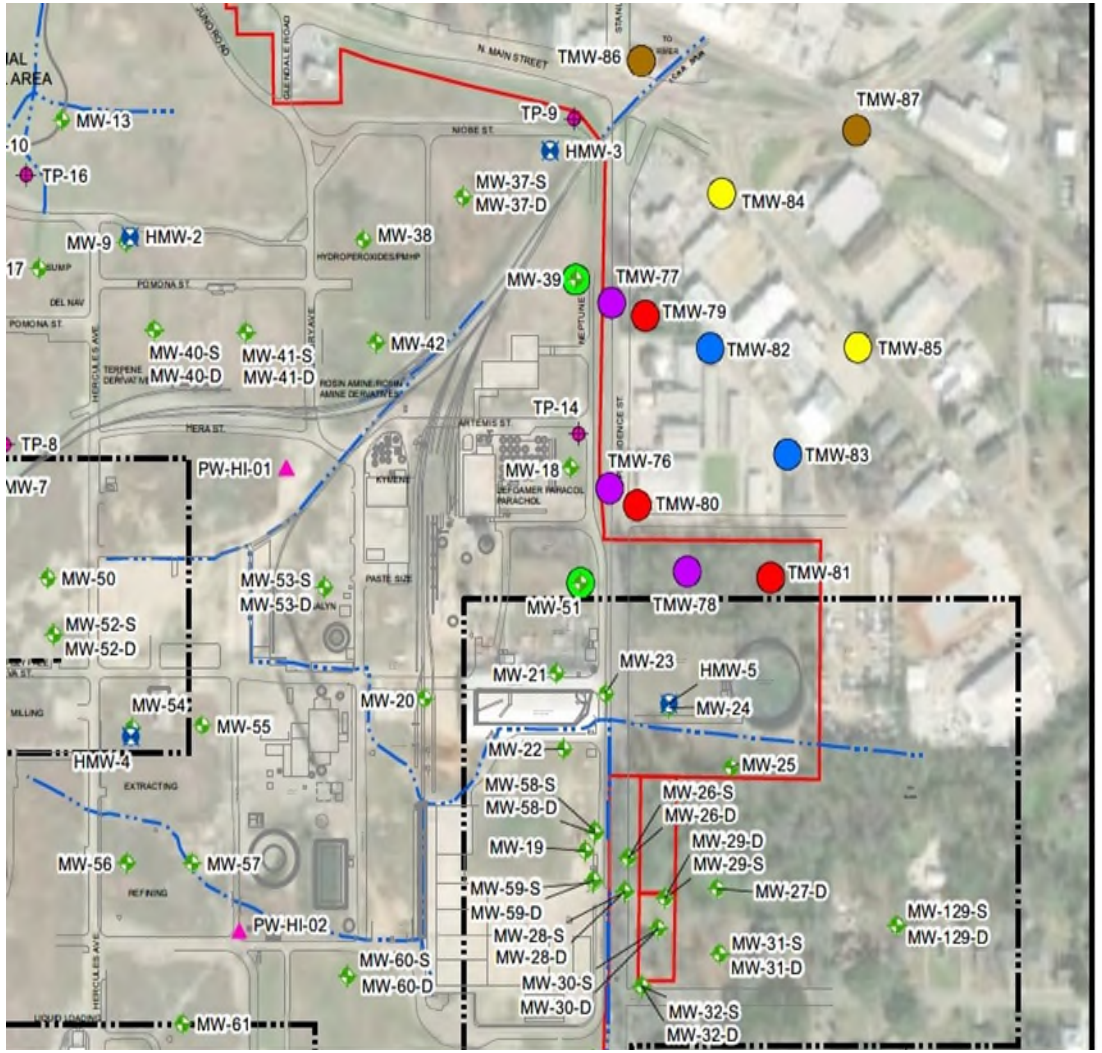
- **No additional sources and findings consistent with previous investigations**
- Data incorporated into risk assessment
- Identified during interpretation of historical aerial photography (1937 to 2015)

Drainage C Investigation

- **No unacceptable risk to potential receptors**
- No changes to conceptual site model
- Assessment complete



Groundwater Quality Evaluation (Northeast)

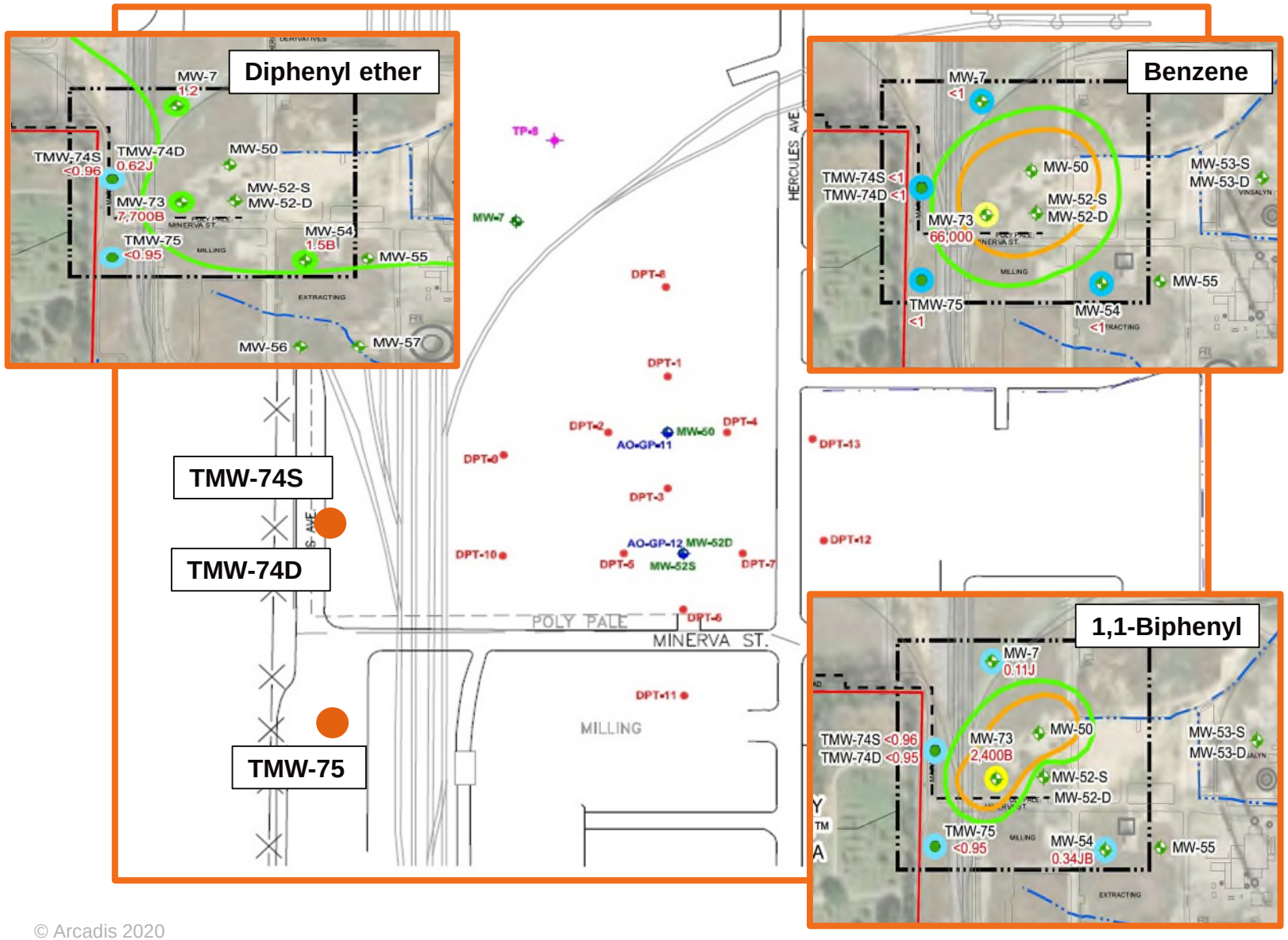


LEGEND

- MONITORING WELL LOCATION
- CREEK MEDIA SAMPLING POINT LOCATION
- PIEZOMETER LOCATION
- HATTIESBURG MONITORING WELL LOCATION
- INDUSTRIAL WELL
- EXISTING PERMANENT WELL SAMPLED IN AUGUST 2019
- TEMPORARY WELL INSTALLED IN AUGUST 2019
- TEMPORARY WELL INSTALLED IN OCTOBER 2019
- TEMPORARY WELL INSTALLED IN DECEMBER 2019
- TEMPORARY WELL INSTALLED IN MARCH 2020
- TEMPORARY WELL INSTALLED IN MAY 2020
- INTERMITTENT DRAINAGE DITCH
- HERCULES PROPERTY BOUNDARY

- **Exposure pathway not complete**
- Delineation completed of nature and extent of groundwater plumes
- Low residual concentrations (below TRGs and/or near RSLs) off site (diphenyl ether and 1,4-dioxane)

Poly Pale™ Area



- **Delineation of groundwater plumes complete with new wells in 2019**
- Ongoing semiannual groundwater quality monitoring
- DNAPL in MW-50 (semiannual removal)
- **Poly Pale™ Pilot Test Work Plan for AS/SVE (January 12, 2021) to provide source remediation**

Baseline Risk Assessment Update

Human Health and Ecological Risk Assessment

Developed in phases per agreement with USEPA and MDEQ:

- Final Identification of Exposure Domains for the BRA (March 8, 2018)
- Final Data Evaluation of Exposure and Toxicity for the BRA (September 13, 2019)
- Response to Comments (January 20, 2020)
- **Draft Baseline Risk Assessment (January 29, 2021), delivered February 1, 2021**

HHRA:

- **No unacceptable risk under current conditions**
- Potential risk to future workers can be mitigated though health and safety controls
- Potential future vapor intrusion concerns can be mitigated through engineering controls
- Potable use of groundwater will continue to be restricted (expand restrictions to areas currently with no restriction)

ERA:

- **Potential ecological risks to receptors are negligible**
- Exception is associated with exposure to total dioxathion in soil, sediment and surface water
- Uncertainty due to total dioxathion data generated prior to 2018 versus data from new analytical procedure

Remedial Action

Completed Remedial Measures

- Sewer replacement along Providence Street
- Waste removal, stabilization, backfill, and capping of former impoundment basin (IB)
- Waste removal, stabilization, and decommission of ET-10

Presumptive Remedies

Groundwater/Soil:

- Poly Pale™ Area: AS/SVE to expedite mass removal
- Biodegradation of 1,4-dioxane former landfill area: pilot testing of in-situ enhancements
- Potential to expand AS/SVE or supplemental technologies to other areas (e.g., former IB area, northeast site boundary, Delnav)
- Long-term monitoring: groundwater plumes stability and program optimization (Plan under quality review)
- DNAPL gauging and removal: mass removal and natural source zone depletion
- Maintain and monitor landfill cap
- Institutional controls to restrict/limit groundwater and land use

Sludge Pits:

- Analyses of sludge samples were required to understand geotechnical, stabilization, and treatability parameters
- Closure through consolidation, stabilization, and capping

Surface Water:

- No unacceptable risk: long-term monitoring

Vapor Intrusion:

- Currently no unacceptable risk
- Engineering controls (e.g., vapor barriers, vapor intrusion mitigation system)

Open Discussion