



# Sediment Cap Installation and River Bank Restoration on the Ohio River



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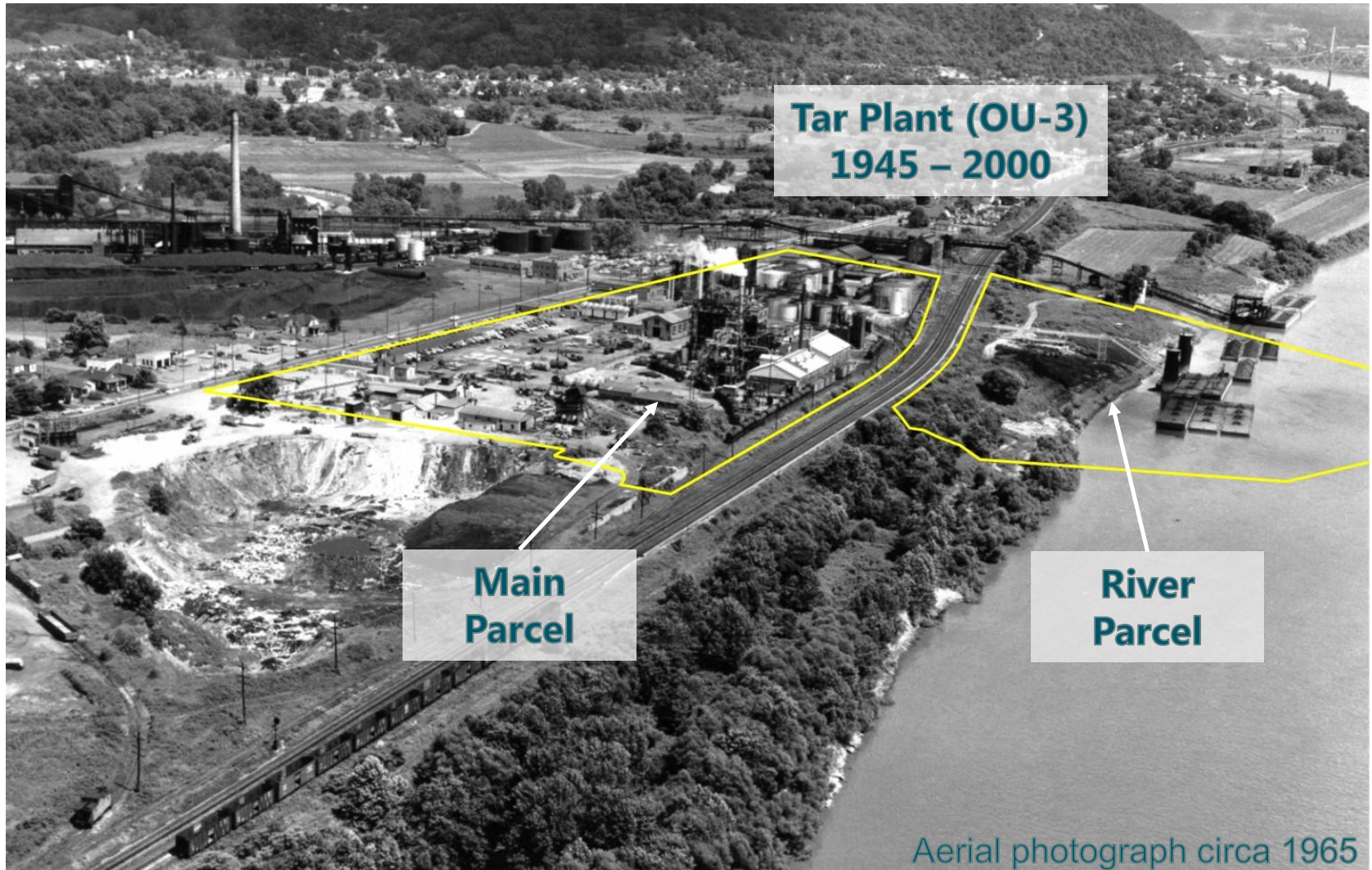


Proceedings of Western Dredging Association and Texas A&M University Center for Dredging Studies  
Dredging Summit and Expo 2015

# Presentation Overview

- Project objectives
- Project components
- Project constraints and site logistics
- Cap placement approach & verification

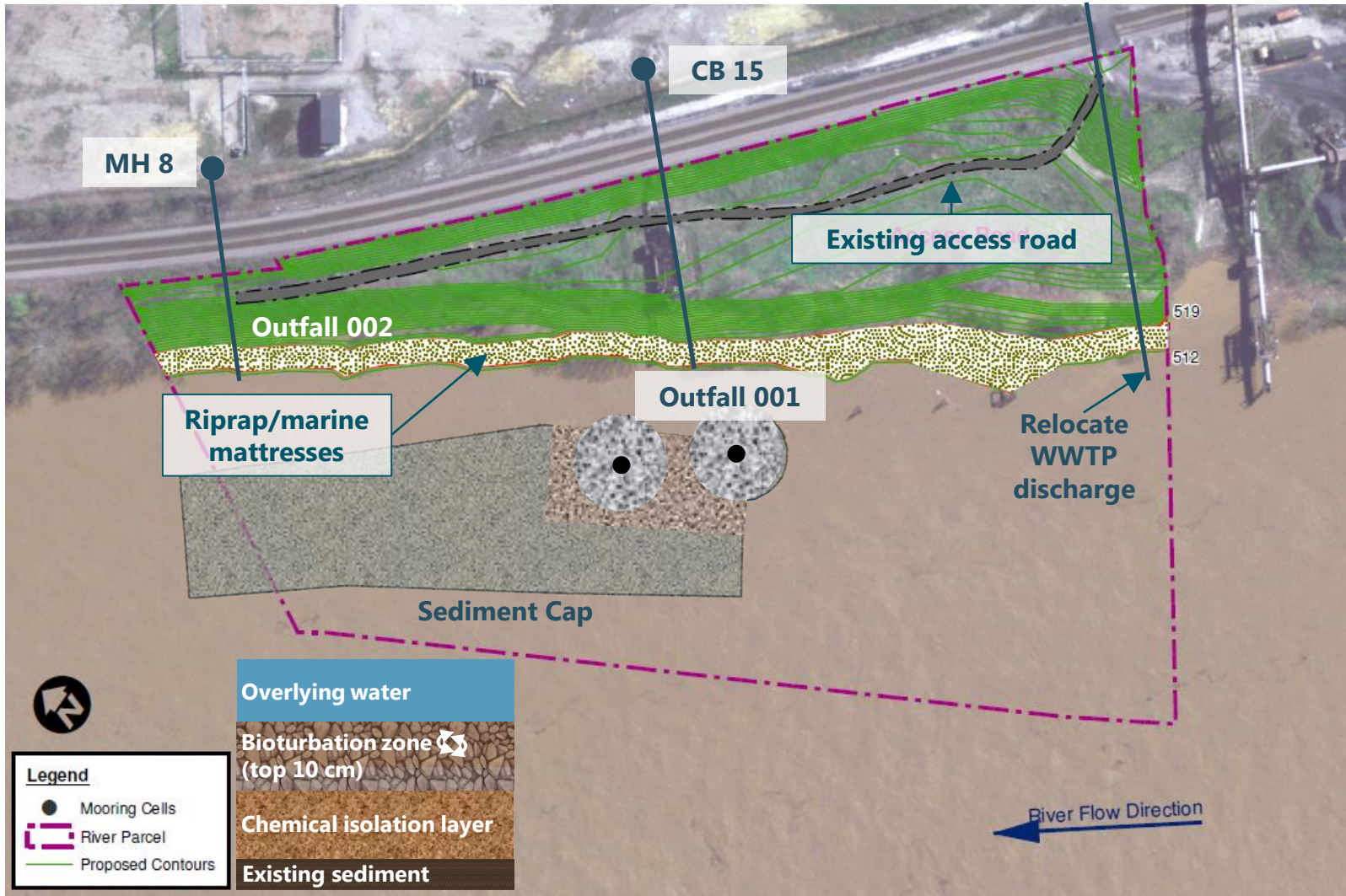
# Historical Overview



# Project Objectives

- Contain and stabilize river bank soils
- Stabilize the shoreline
- Place a cap over offshore sediments contaminated with polycyclic aromatic hydrocarbons (PAHs) from historical operations
- Other site improvements including
  - Relocation of stormwater outfalls
  - Removal of historical process piping
  - Installation of wastewater treatment plant (WWTP) discharge

# Remedial Design



# Project Components

- Debris removal
- Construction & installation of marine mattresses
- Demolition of historical pipelines, outfalls, and other nearshore structures
- Installation of a new stormwater conveyance system including plunge pools
- Shoreline grading and restoration
- Multi-layer cap installation in the Ohio River

# Project Constraints and Site Logistics

- Active rail line bisecting the site
- Threatened and endangered species protection
- In-water construction windows
  - July 1 through December 31
- Large amount of debris
- Large water-elevation variations
  - 514 to 525 feet mean sea level
  - Steep, submerged slopes (steeper than 2H:1V in spots)
  - Required installation of a buttress fill prior to cap installation

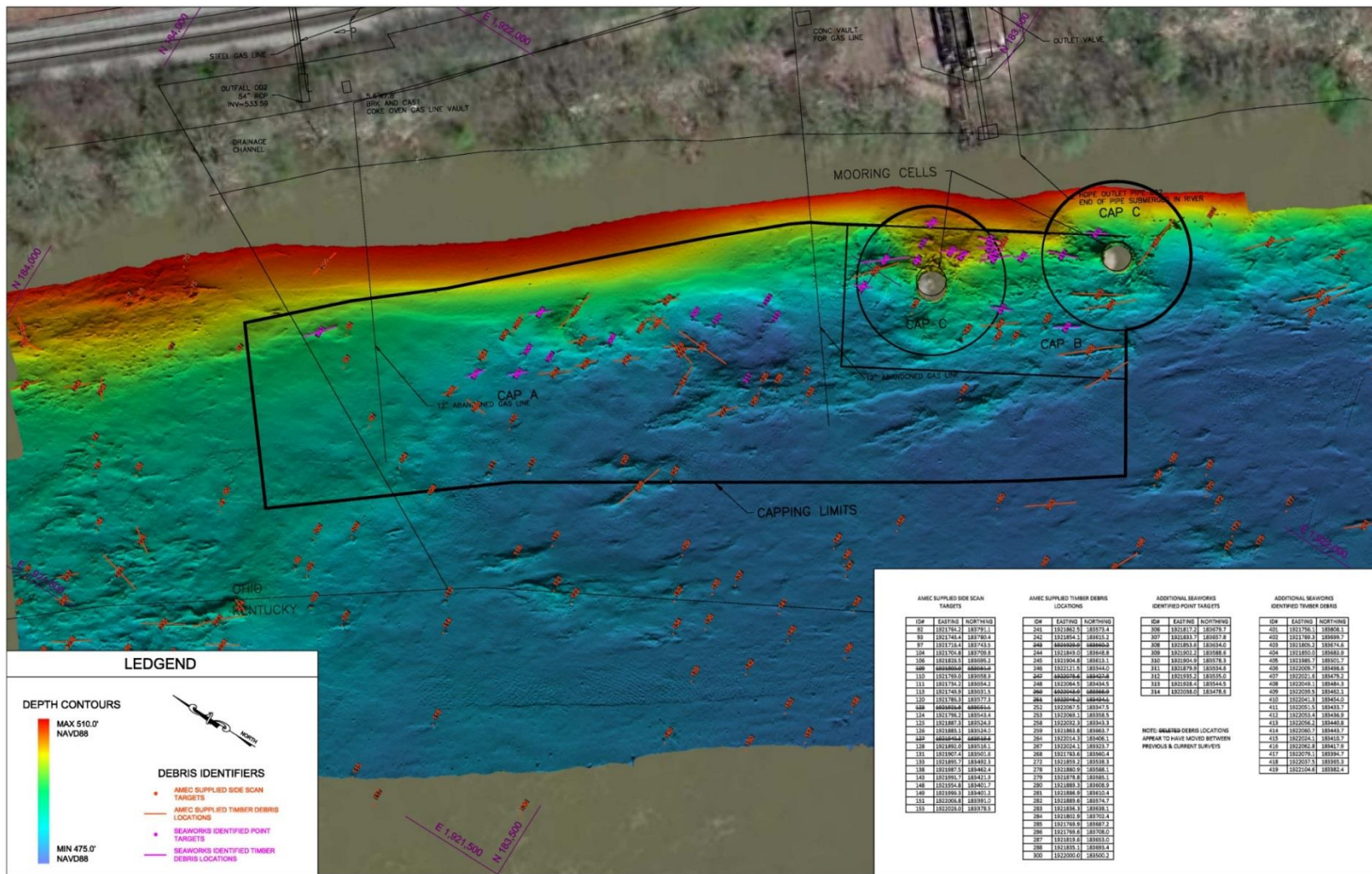
# Debris Removal

- Extensive woody debris
- Performed prior to marine mattress and cap installation
- Mechanically removed
- Long-reach excavator
- Grapple attachment
- Chip and stockpiled on site
- Approximately 75 tons





# Debris Removal



# Debris Removal



# Marine Mattress Placement

- Constructed marine mattresses on the main parcel
- 440 mattresses in lengths of 5, 10, 15, and 20 feet
- Used custom jib and a lot of labor!
- Stockpiled then transported to offloading area by truck
- Placed from the water utilizing a 100-ton crane from the water



# Marine Armor Mattress Placement



# Marine Armor Mattress Placement



# Cap Placement Approach

- Performed using cabling and winch systems to control barge movement
- Flexi-float barge system with spuds and a long-reach excavator
- Real-time position tracking of the material placement
- Sequencing upstream to downstream, bottom of slope to top of slope



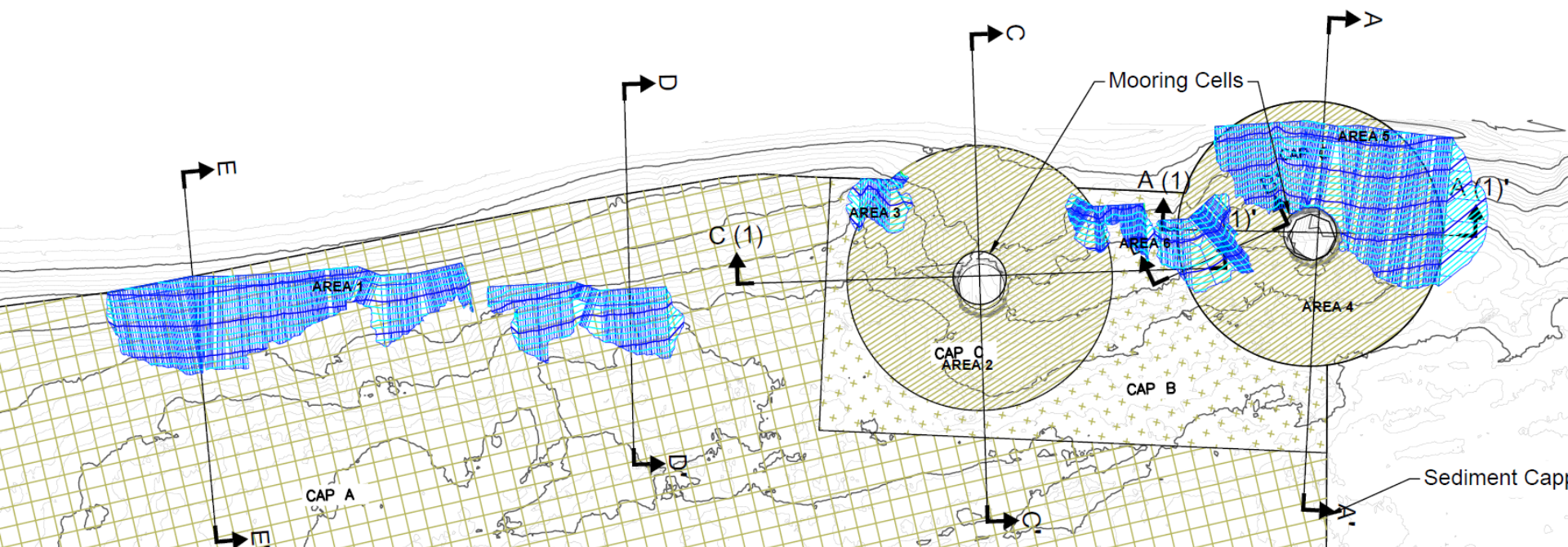


## Cap Design

- Cap A
  - 6 inches of sand
  - 6 inches of gravel
- Cap B
  - 6 inches of sand
  - 6 inches of gravel
  - 12 inches of cobble
- Cap C
  - 6 inches of sand
  - 6 inches of gravel
  - 18 inches of cobble

# Buttress Installation

- Pre-construction survey identified six buttress areas
- Placed approximately 1,500 tons of isolation layer (sand)





# Cap Installation

- Placed approximately
  - 10,000 tons of sand
  - 8,000 tons of gravel
  - 1,800 tons of cobble
- Construction schedule
  - 10 hours per day
  - 6 days per week
- Completed in approximately 85 days



# Cap Installation

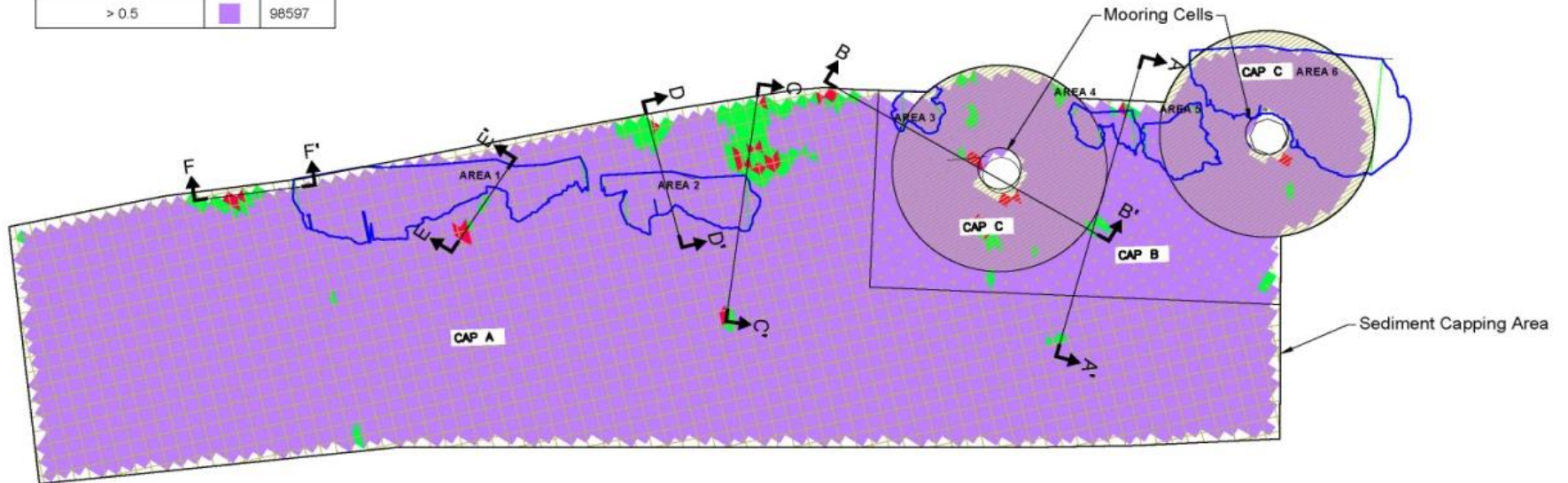


# Cap Installation



# Cap Placement Verification

Difference Between Pre-Construction and Post Isolation Cap Elevation		
Elevation Difference (ft)	Color	Area (sf)
0 to 0.3	Red	2084
0.3 to 0.5	Green	3266
> 0.5	Purple	98597



E:\CAD\Drive\0207-01 - Honeywell International\0207-01 - Ironton Tar Plant\0207-RP-007 - 5x5 Grid Post Isolation Layer delineation.dwg P101

# Safety



- 8.5 months
- More than 26,000 man-hours
- 23 contractors
- **Zero** safety incidences

# Questions



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