TVA Kingston Ash Recovery Project
Roane County, TN
Regulatory Framework

World of Coal Ash Conference

May 9-12, 2011 - Denver, Colorado

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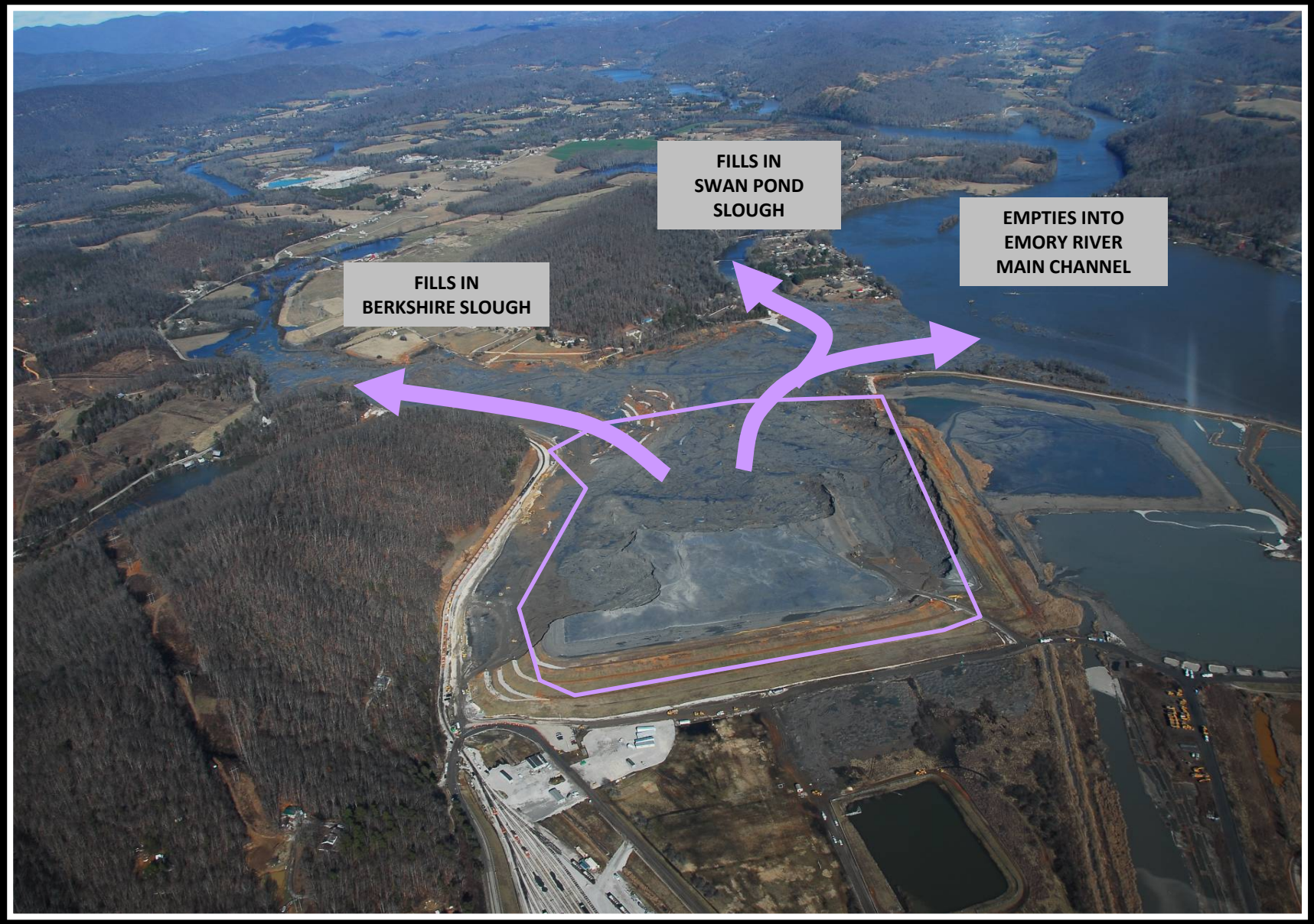
US EPA Region 4 – Superfund Division

Dredge Cell Area Pre-Spill

Spill Progression – 12/22/08



Dredge Cell Area Post-Spill

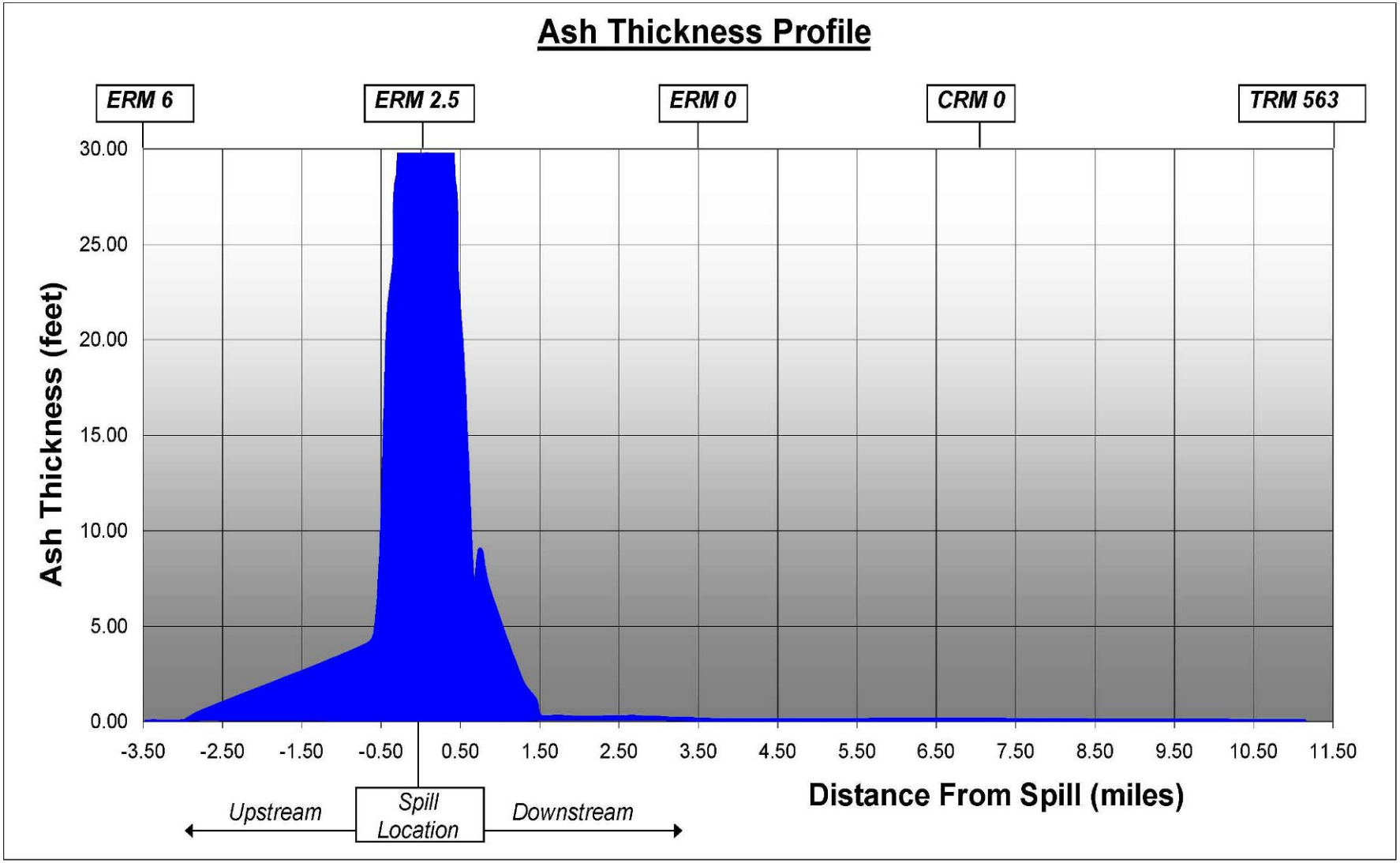
Root Cause Analysis

Kingston Dredge Cell Failure Conditions

CERCLA Removal Action Strategy

- **Phase 1 (Time-Critical Action Removal)**
  - 3.5 million cys removed (excavated and dredged)
  - 4.0 million tons disposed at Perry County, AL (completed 12/01/10)
  - May 29, 2010 Emory River reopened
- **Phase 2 (Non-Time Critical Action Removal)**
  - 2.8 million cys to be removed (north and middle embayment)
  - Consolidate in reinforced, on-site disposal area
  - Construct robust subsurface perimeter containment system to withstand earthquake loads
- **Phase 3 (Residual Ash Study)**
  - River ecosystem and human health risk assessments
  - Long-term monitoring (5-year reviews)

Ash Deposition (Pre-Dredging)

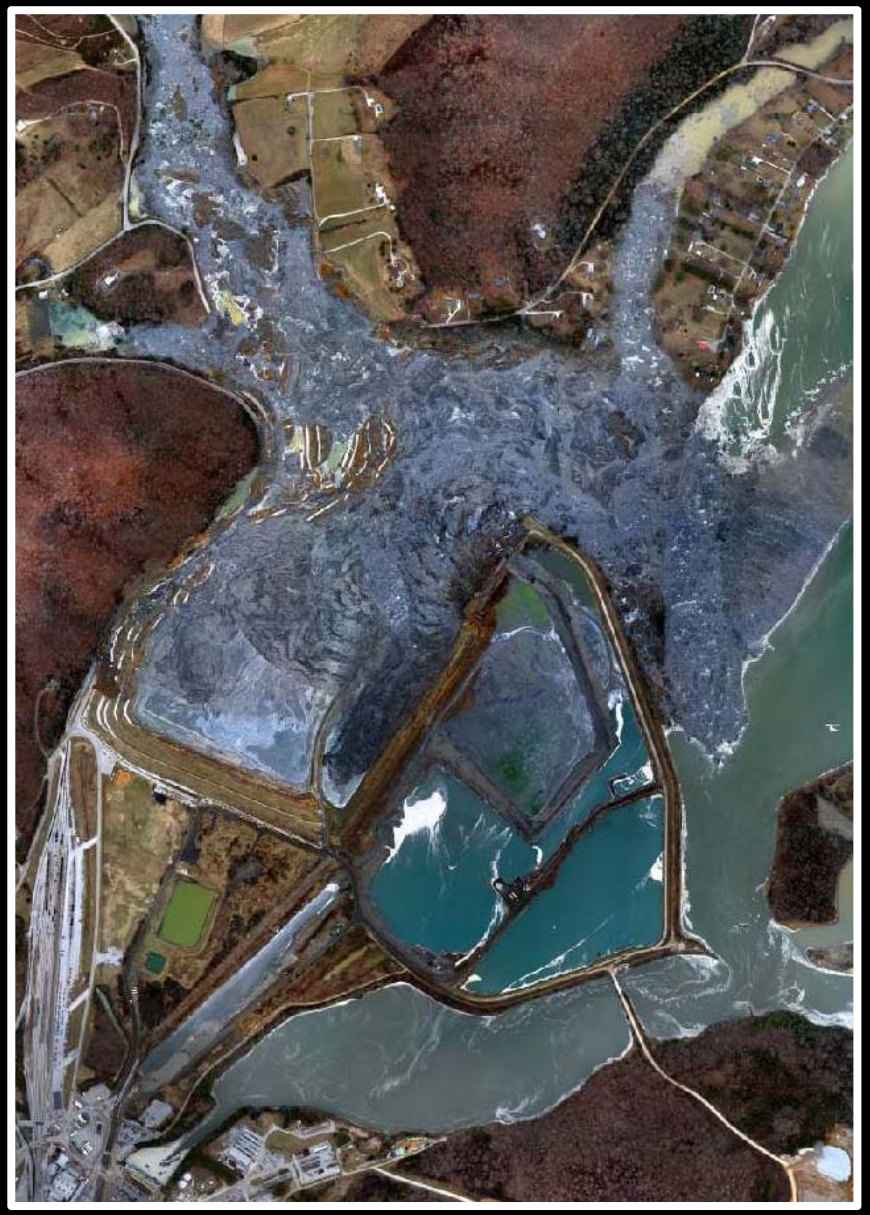


Mechanical + Hydraulic Dredging

Ash Processing

Loading and Disposal

2 Years of Recovery

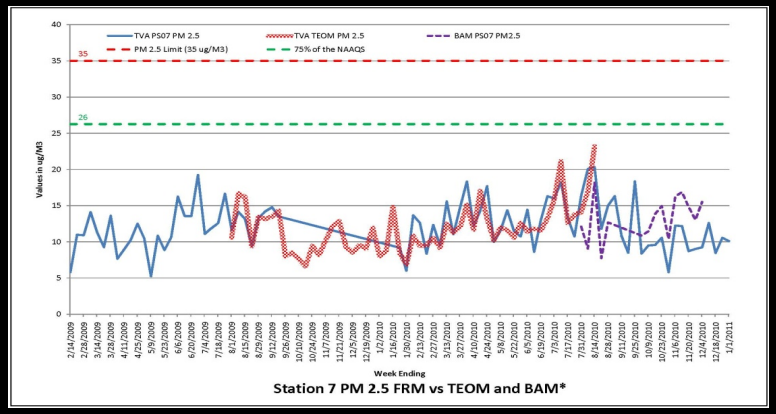


December 23, 2008

January 24, 2011

Phase 2 Work Description

- Excavate Ash (Armada of Yellow Iron)
  - Pan Scrapers
  - Excavators/dump trucks
- Short-Term Storage
  - Dry to Optimum MC (17 to 23%)
  - Lime (6% by weight)
- Long-Term Storage in Dredge Cell
  - Placed in 1 foot lifts
  - Compacted to 90% proctor
  - In-situ density/Piezos/Inclinometers
- Perimeter Containment System
- Perimeter Air & IH Monitoring
- Storm Water Mgmt & Monitoring
- Health & Safety Program

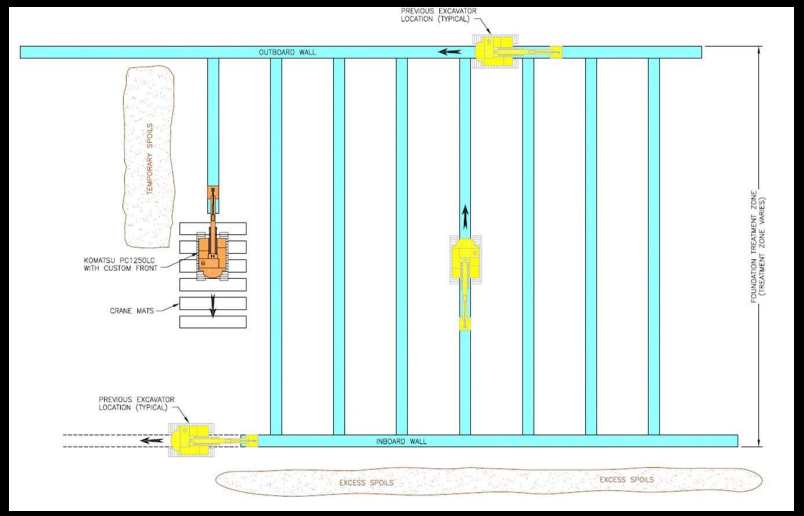


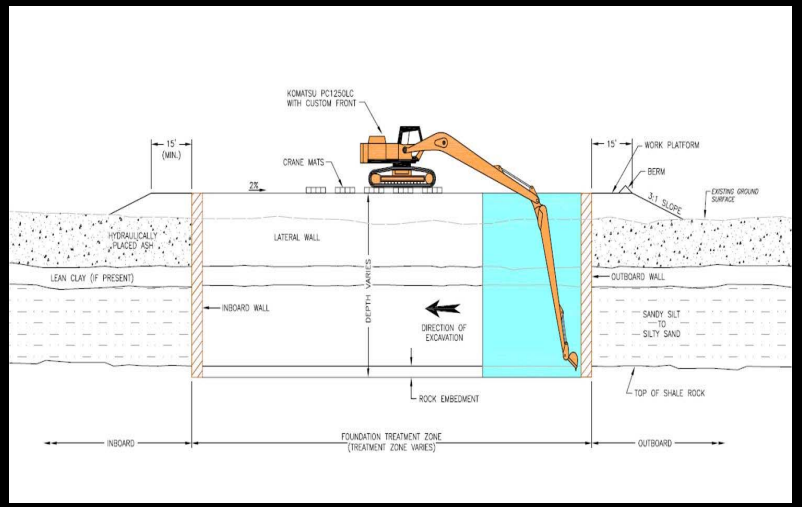
Phase 2 Work Areas

Why Moisture Content Matters

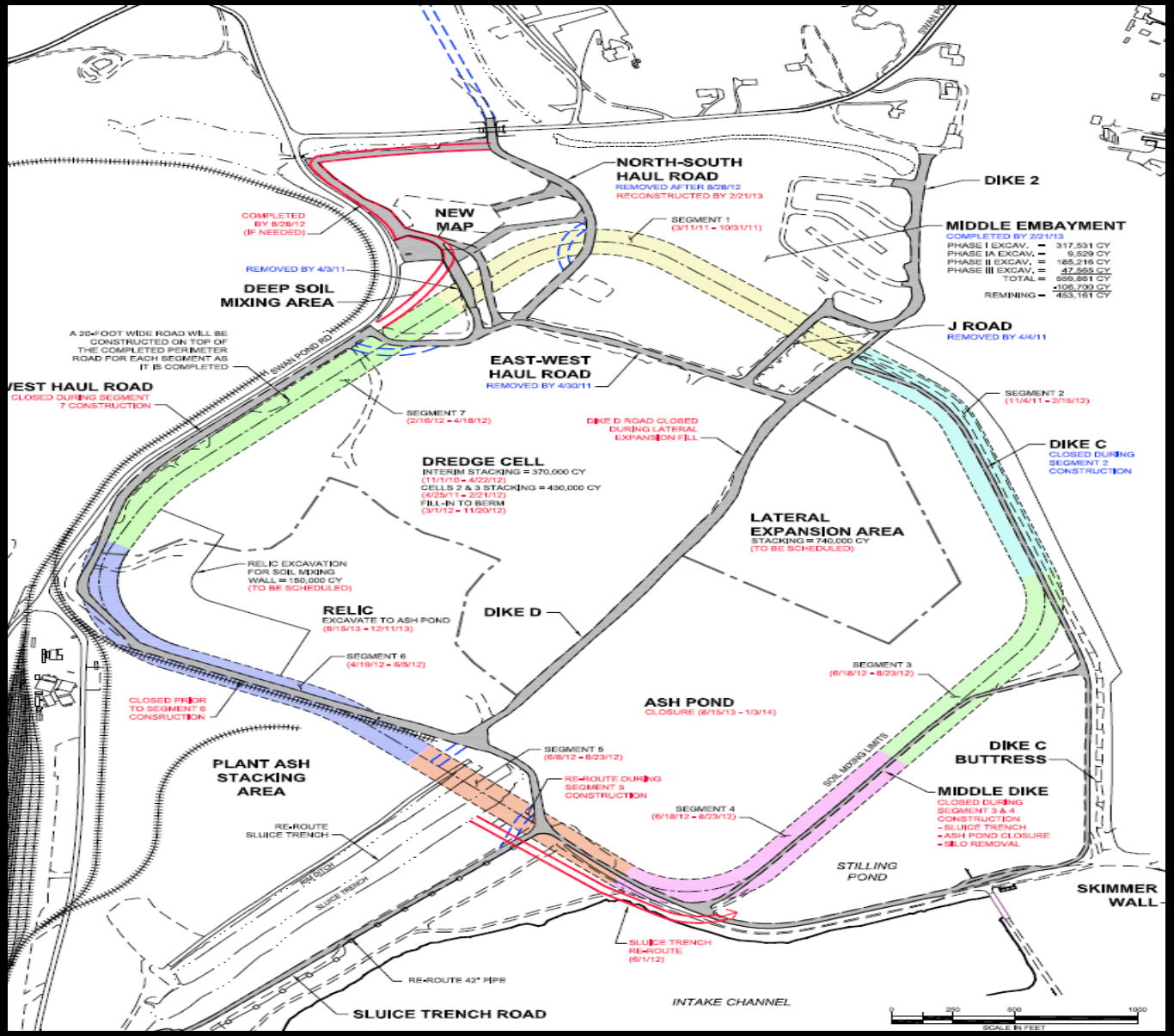
Perimeter Containment System

- Design based on 3-D Seismic Model (FLAC)
  - 6.0 earthquake on East TN fault
  - 7.6 earthquake on New Madrid fault
- ≈11,500 linear feet (around perimeter of cell)
- 50-70 feet BGS
- Keyed 2-3 feet into shale bedrock
- Target UCS ranges 150-200 psi
- 9 contractors submitted proposals
  - Deep Soil Mixing (multi-axis, vertical mixing tools)
  - Cutter Soil Mixing (horizontal-axis cutters)
  - Jet Grouting
  - Slurry Trench Methods
  - Cement-Bentonite (self-hardening slurry)
- Proposals reviewed by technical team
  - TVA, Stantec, Jacobs, USACE, URS

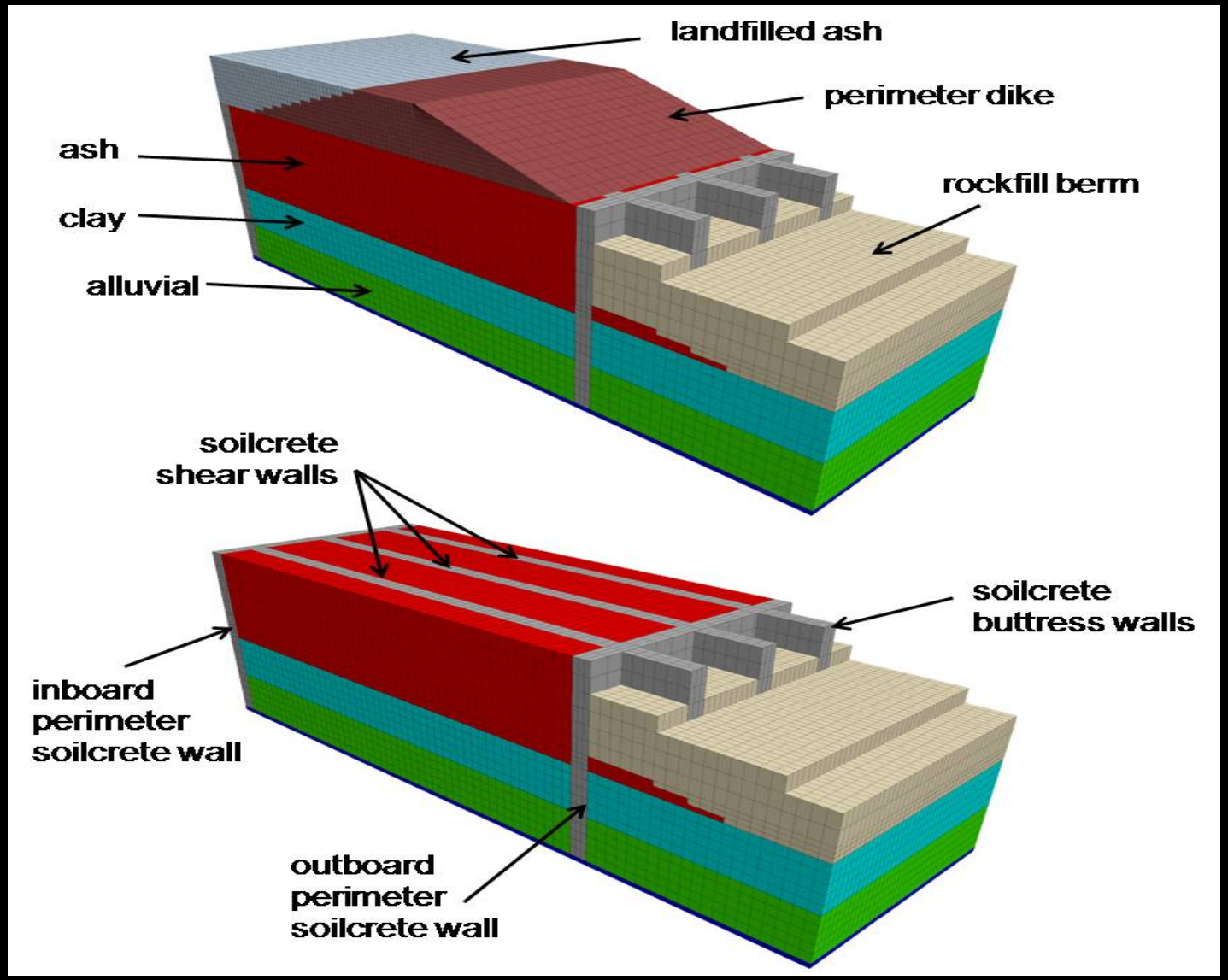




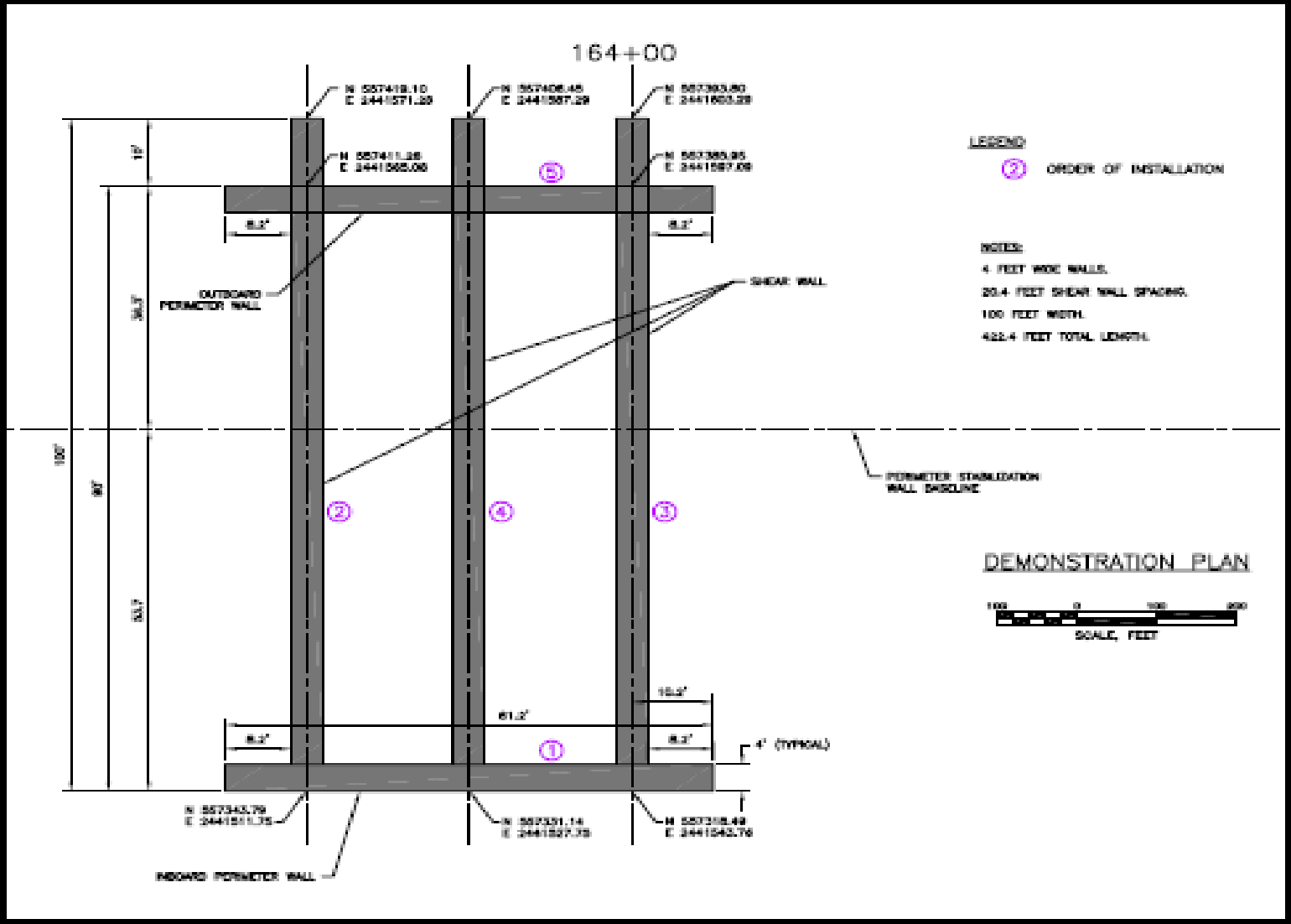
Perimeter Containment Layout



Perimeter Containment Design



Pilot Scale Demonstration
April 2011



Pilot Demonstration Project

- Batch Plant for Slurry Recipe
  - 20% fine blast furnace slag
  - 3% bentonite
  - 0.5% portland cement
- Long-stick Komatsu 1250 Excavator
- 4’ wide bucket with teeth

Conclusions

- Full Scale Slurry Wall Installation Scheduled Start May 2011
- Ecological Sampling to Continue thru Aug/Sept 2011
- Action Memo for Phase 3 - River System SAP anticipated in 2012
- Construction schedules currently run thru 2014
- Questions?
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