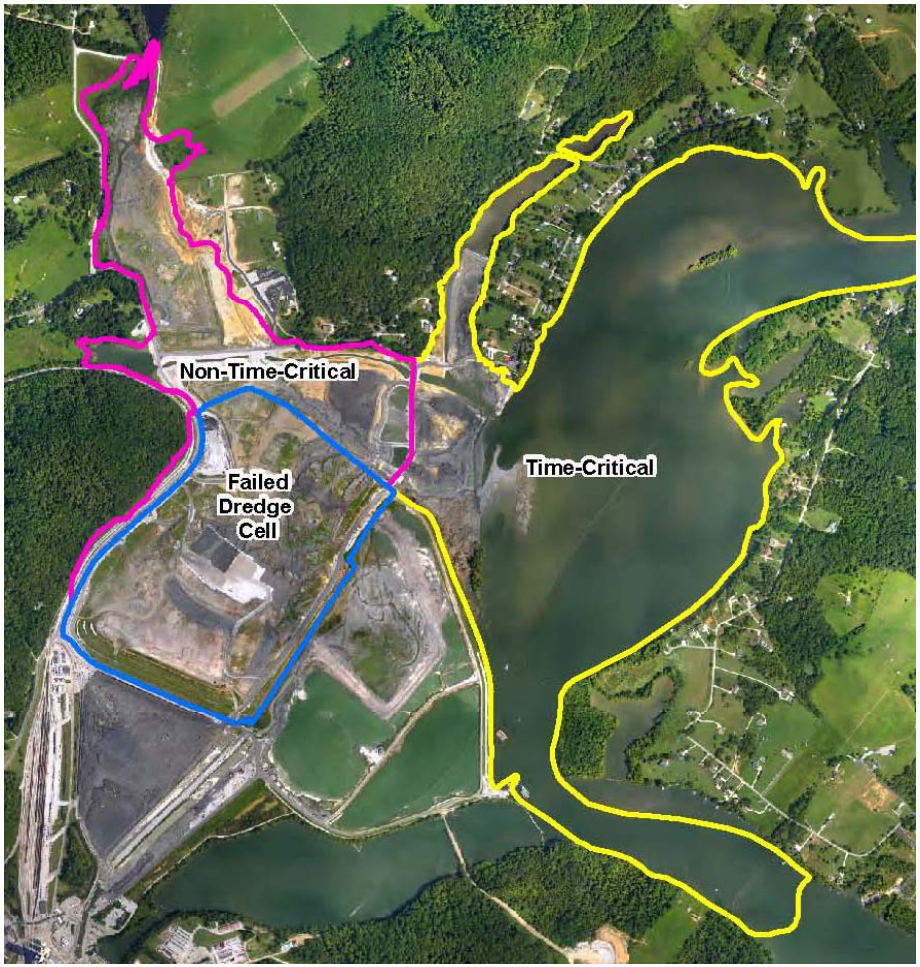
Embayment/Dredge Cell Engineering Evaluation & Cost Analysis Report
TVA Kingston Ash Recovery Project

Kingston Ash Recovery Project Layout

Engineering Evaluation/ Cost Analysis (EE/CA)

- Describes three alternatives for next phase of Site work (e.g. Non-Time Critical Removal Action)
- Selected EE/CA alternative "shovel ready" ready by completion of Time Critical river dredging to ensure seamless transition of work

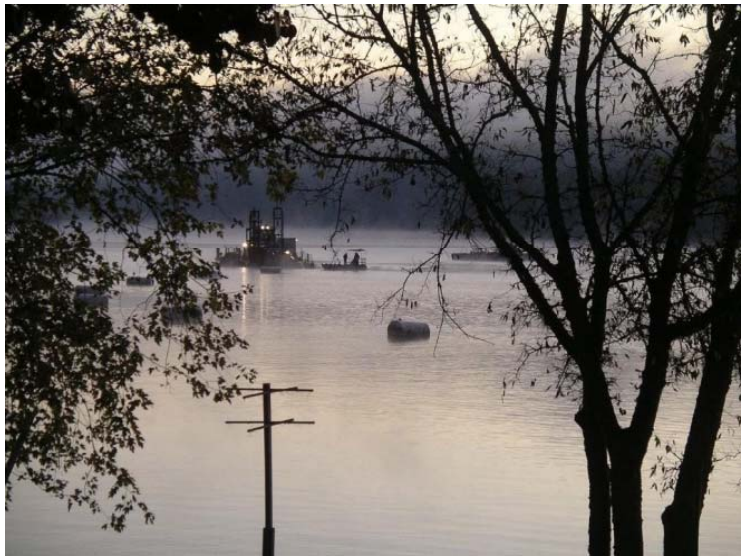


Engineering Evaluation/ Cost Analysis (EE/CA)

- **Cleanup alternatives based on environmental sampling/analysis & human health/ecological risk assessments to address Removal Action Objectives (RAOs):**
  - Minimize contact between ash in embayment and surface water flowing to Watts Bar Reservoir;
  - Minimize migration of ash from embayment/dredge cell into surface water via erosion;
  - Minimize exposure by human/ecological receptors to ash;
  - Restore embayment to pre-spill conditions;
  - Close former dredge cell in accordance with Tennessee Solid Waste Rule 1200-1-7 and;
  - Safely dispose of all waste streams from removal action.

EE/CA Alternatives

- **Common Elements**
  - Restoration of embayments & sloughs to pre-spill conditions
  - Closure of failed dredge cell and adjacent Ash Pond
  - Enhanced perimeter dikes constructed of soil-cement columns for long-term stability of dredge cell (designed to withstand liquefaction of foundation ash at earthquake loads)
- **Significant Differences**
  - Amount of coal ash disposed off-site vs. on-site
  - Final elevation of closed dredge cell
  - Type & amount of construction traffic
  - Duration of work
  - Cost



EE/CA Alternative #1

Disposed Offsite	Remaining Onsite – Closed Dredge Cell	Disposal Traffic	Disposal Duration	Overall Project Duration	Cost
2.8 million CY	10.8 million CY & 4.0 million CY in Ash Pond Cell closed at 790' MSL	380 Trains →	19 months	2.8 years + 10 months to close Ash Pond	$440 - $450 million
		or			
		280 Trains & 35,000 Truck Loads →	14 months		

EE/CA Alternative #2

Disposed Offsite	Remaining Onsite – Closed Dredge Cell	Disposal Traffic	Disposal Duration	Project Duration	Cost
6.8 million CY	6.8 million CY & 4.0 million CY in Ash Pond Cell closed at 765' to 780' MSL	910 Trains →	45 months	4.1 years + 10 months to close Ash Pond	$720 - $740 million
		or			
		810 Trains & 35,000 Truck Loads →	39 months		

EE/CA Alternative #3

Disposed Offsite	Disposed/Remaining Onsite – Closed Dredge Cell	Disposal Traffic	Disposal Duration	Project Duration	Cost
No Offsite Disposal	13.6 million CY & 4.0 million CY in Ash Pond Cell closed at 805' MSL	None	None	4.0 years + 10 months to close Ash Pond or 4.1 years to close both ash pond and dredge cell together	$270 - $320 million

Alternative Evaluation Criteria

- **Effectiveness**
  - Achieve Removal Action Objectives (RAOs)
  - Compliance with other laws/regulations (ARARs)
  - Short and Long-term protection of human health & environment

- **Implementability**
  - Time to achieve RAOs
  - Construction and technology performance for excavation, dewatering, transportation, disposal, foundation treatment and restoration

- **Cost**
  - Capital Costs (Net Present Value) in 2009 dollars
  - Annual Operation and Maintenance (O&M) costs

EE/CA Implementation

- **Public Comment Period**
  - Initial 30-day period to make substantial comments regarding cleanup alternatives (January 19 – February 20, 2010)
  - Requests for extension received from Roane County Long-Term Recovery Council, Community Advisory Group (CAG) and Environmental Integrity Project
  - Comment period extended 30 additional days (January 19 – March 20, 2010)
- **Action Memo**
  - Released after 60-day public comment period and full consideration of comments received
  - Describes selected removal alternative
  - Initiates next phase of work (May 2010)

Goal of Embayment Removal Action
Church Slough

Questions?

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