CLOSING UP SHOP AT THE WATTS BAR FOSSIL PLANT LESSONS IN COAL ASH POND CLOSURE

2015 WORLD OF COAL ASH CONFERENCE

Presenters:
Jimmy Mullins (TVA)
David Mason (CDM Smith)

May 6, 2015

http://www.flyash.info/
Presentation Outline

• Introduction and Background
• Regulatory Initiatives
• Design Process
• Construction/Implementation
• Design/Construction Challenges
• Conclusions and Lessons Learned
**Watts Bar Fossil Plant near Spring City, TN**
- Constructed in the 1940's
- Ceased power production in 1982
- Closure of slag and chemical pond areas in 2007
- Plant demolition in 2012
Regulatory Initiatives

- US EPA’s ongoing efforts to assess the management of coal combustion residuals
  - Poor rating due to lack of information and potential threat for environmental damage
- Ash/Stilling Pond Area Outfall 002 falls under the WBF NPDES modified permit No. TN0005461
- TVA Dam Safety Program follows the federal dam safety program of the Federal Emergency Management Agency (FEMA).
Primary Objectives for the Ash Pond Closure Project

1. Replace the existing spillway;
2. Remove all ash from the stilling pond;
3. Cap and close the existing ash storage area; and
4. Address EPA comments related to the containment dike.
Existing Conditions & Site Features

- North Pond
- South Pond
- Dry Ash Area
- Security Access Road
- Perimeter Containment Berm
- Nuclear Security Barriers
- Regulated NPDES Outfall
- Existing Riser Structures
- Splitter Dike
- Perimeter Containment Berm
- Nuclear Security Barriers
- Regulated NPDES Outfall
- Existing Riser Structures
- Splitter Dike
Dewatering and Ash Removal Process
Method to Verify Ash Removal

• Clearance of ash down to soil sub base across approximately one acre of area
• Layout 40’ x 40’ grid
• Placement of 1’ x 1’ template on each flag
• Visual check that no greater than 10% of the area can be considered ash
• Photo documentation & GPS
De-mucking and Ash Removal Process (continued)
Verification of Ash Removal

Photo No. 9

**Description:**
Date: 8-27-14
GPS Location: 35.60374, -84.78068

**Client Name:** Tennessee Valley Authority
**Site Location:** TVA Watts Bar Fossil Plant, Spring City, TN
**Work Plan 2: Ash Pond Closure**

**Project No.:** WBF-10W254-IWP-2
Existing Corrugated Metal, Riser Spillways
Final Spillway Design
Construction of Containment Berm for Ash Storage

- Clear ash from footprint of berm area
- Construct using select fill in 8” lifts with 95% compaction
Construction of the Ash Stack
Construction of the Ash Stack
Additional Prep Prior to Liner Deployment

Undercut/Repair Ditch Subgrade

Kiln Dust Application
Cap Design

SOD

6" Vegetative Cover Soil

18" Protective Cover Soil

Geocomposite Drainage Net

40 mil Textured LLDPE Geomembrane

Proposed Ash Fill
Design/Construction Challenges

- Coordination with Watts Bar Nuclear
- On-going, NPDES water quality monitoring requirements
- Archeological & sensitive habitat areas
- Transmission lines and structures
- Summer/Winter Pool
Accommodating Security Procedures Throughout the Project

• Pond acts as a natural vehicle barrier and is included in the security plan for the site
• Security patrols the perimeter every 30 minutes
• Impeding security was non-negotiable
Construct New Nuclear Barrier with “King Tuts”
Water Quality Treatment During Dewatering Process

Polyacrylamide (PAM) Erosion Control Powder applied to Jute Coir Fabric on exposed Ash and Clay Banks.

- Check Dam with Jute and flocculation logs applied
- Coffer Dam
- Fair cloth Skimmer
- Flow diversion booms
- Jute/PAM Filter Curtains
- Check Dams
- 6” pump
Addressing Sensitive Cultural and Habitat Areas

Bat habitat

Potential Mussel Habitat

Archaeological areas

Bat habitat
Major Transmission Lines Through the Site
Transmission Line Clearance/Avoidance

Test Pits to Verify Ash Depth

Excavation Designed to Meet Structural Foundation Requirements
Dealing with Varying Summer and Winter Pool Elevations

- River/Lake is operated at various levels based on seasons.
- Need to design a controlled discharge to river and prevent erosion.
- Limitations on fill within Waters of the State.

Summer Pool: EL 682
Winter Pool: EL 675
Spillway and Energy Dissipation Design & Construction Considerations

- Required a phased construction sequence depending on season.
Final Site Conditions
Conclusions and Lessons Learned

• What Can Go Wrong Will Go Wrong

• Plan Ahead if a Fast Track Design is Anticipated

• Perform Site Investigations Well Ahead of Design Phase (cultural, environmental, etc)

• Interdisciplinary Coordination is Vital

• Ensure That You Have Buy-In On Important Decisions
Wrap-up & Questions