Center Hill Dam
Seepage & Remediation

Robert Brimm
Presenter Title: Geologist
Duty Location: Nashville District; Center Hill Dam
Date of Presentation: 4 August 2010
Center Hill
Briefing Outline

• Location

• History

• MDE, Groin & Left Rim Foundation
  Grouting Contract; Kiewit – A.C.T a J.V.

• Left Rim Excavation
Center Hill Project Location
Geologic Map
Cumberland River Profile
Project Features

- Embankment
- Concrete Dam
- Right Rim
- Left Rim
- Saddle Dam
Left Rim
Geology & Sinkholes

Legend

Geology

\[\text{Fort Payne} \quad \text{Chattanooga Shale} \quad \text{Leipers} \quad \text{Catheys} \quad \text{Cannon}\]
Left Rim Sinkhole #11
Picnic Spring

Lake @ Elevation 646’

Lake @ Elevation 672.2’

9 May 2003
**Build Strong®**

**Slide 10**

**Grout & Cutoff Walls**

**Legend**
- Grout Line
- Cave Fill
- Barrier Wall
- RCC Berm

**Concrete Section**
- (2) Grouting

**Main Embankment & Left Rim**
- (1) Grouting
- (2) Barrier Wall

**Saddle Dam Embankment**
- (3) RCC Berm

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**Timeframe Major Construction Contracts**

- 2008-10: (1) Grouting at Embankment and Left Rim, Cave Fill
- 2010-12: (2) Barrier Wall at Embankment and & Grouting
- 2012-13: (3) RCC Stability Berm at Saddle Dam
- 2014: Completion
Current Contract

- Awarded to Kiewit – A.C.T. a J.V.
- Foundation Grouting of the Main Dam Embankment, Groin, and Left Rim
Grout Line Location

Left Rim

445

Groin

203

Main Dam Embankment

428
Total Gallons of Grout

- Embankment 511,567
- Left Rim 574,110
- Groin 205,290
- Total 1,290,967
Wetland/Water Flow Path
Water Treatment Statistics

- Total Gallons Treated = 530,525,600
- Treatment Capacity = 4000 gallons/min
- CO 2 Usage = 472,248 pounds
- Floc Logs 10# = 244
- New Flocculent/Coagulant System
- 100 to 120 Tons of Solids/Week Smith County Landfill as Special Waste
- Grout Shows = 35
HISTORICAL DRILL AND GROUT SHOW DIAGRAM
Data current through 06/15/2010
- Excavation Totals: 470,000 Cu. Yds.
Soil Nails

DAM →
Soil Nails
More Excavation
Installing Wire Mesh
Rock Fall 12/19/2009

- 40-60 Tons of material came down from an overhang area
- Station 8+50 Upstream Rock face
Slope Stability Analysis

- Strickler & Watts
- Goodman & Berger
Monir Precision Monitoring System
Crack Gauges

- 9 Crack Gauges total, Locations designed by Brendan R. Fisher, PHD, PE, LEG (FSR ENGINEERING)
- All crack gauges connected to panel inside GeoKon Box on left rim.
- Panel is self reliant, with motherboard, and hard drive.
- Panel is wirelessly connected to Intelligrout can via radio, where it will use the Multilogger program to collect and extract the measurements into raw data. It will automatically do this at the end of each day (0:00).
- Excel sheets and Excel charts will be created and will be given to FSR ENGINEERING every weekday morning for review.
- Information from the past week will be summarized and given to the USACE with the Monir Monitoring Program summary.
- The panel will collect readings every 30 seconds continuously (24/7).
- If one of the nine crack gauges surpasses its 6mm threshold, the lights will turn on, and the sirens will sound.
- The panel is set up on an open relay, meaning that if communication is lost, and the panel is not receiving its measurements for any reason, the lights and sirens will trigger.
- If any of the nine crack gauges are damaged or disconnected from the panel, the lights and sirens will trigger.
- If the radio communication from the panel to the laptop is lost, data will be downloaded by connecting the laptop directly into the panel via a parallel cable.
QUESTIONS?