

**Attachments to Transcript of**

**Regional Resource Stewardship**

**Council Meeting May 10-11, 2006**

**in Knoxville, Tennessee**

## *Regional Resource Stewardship Council*

May 10-11, 2006

*Lodging*

Crowne Plaza, 401 West Summit Hill Drive  
Knoxville, Tennessee 37902; Phone: 865.522.2600

*Meeting*

TVA Headquarters  
400 West Summit Hill Drive  
Knoxville, Tennessee 37902  
Phone: 865.632.2333; Fax: 865.632.3146

**Meeting Room: Auditorium**

(All times are EDT)

**Wednesday  
May 10**

**Council Meeting Agenda**

8:00 a.m.

Chairman's Welcome/ Agenda  
Review/

Bruce Shupp, Council Chair  
Dave Wahus, Facilitator

8:15

Welcome/Opening Remarks

Kate Jackson, TVA  
Executive Vice President

8:30

TVA Update

- TVA Board Restructuring
- ES&P Restructuring
- Comparison of present TVA Stewardship activities with those when TVA received appropriations
- ROS Update

Kate Jackson  
Kate Jackson  
Kate Jackson

Steve Adams, TVA

9:30

**Break**

9:45

TVA Infrastructure Description

Janet Herrin, TVA  
Senior Vice President

10:45

TVA Infrastructure Stewardship

Jerry Gibson, TVA

11:45

Lunch

12:45 p.m.

Current Issues

Gary Brock, TVA

1:45

Emergency Preparedness

Wayne Poppe, TVA

2:15

**Break**

2:30

External Coordination

- Local EMA
- State EMA
- U.S. Army Corps of Engineers

Gary Brock - Introductions  
Bill Tittle, Hamilton County  
Emergency Services &  
RRSC Member  
Jere McCuiston, Kentucky  
Division of Emergency  
Management  
Mike Enschede, USACE

3:30

TVA Summary

Janet Herrin

3:50

Presentation of Questions for  
Tomorrow's Discussion

Dave Wahus

4:00

Adjourn Meeting



## *Regional Resource Stewardship Council*

<p><b>May 10-11, 2006</b></p> <p><i>(All times are EDT)</i></p>	<p style="text-align: center;"><i>Lodging</i>            Crowne Plaza, 401 West Summit Hill Drive            Knoxville, Tennessee 37902; Phone: 865.522.2600</p> <p style="text-align: center;"><i>Meeting</i>            TVA Headquarters            400 West Summit Hill Drive            Knoxville, Tennessee 37902            Phone: 865.632.2333; Fax: 865.632.3146            Cell Phone for Emergencies: 865.898.2398</p> <p style="text-align: center;"><b>Meeting Room: Auditorium</b></p>	
<p><b>Thursday May 11</b></p>	<p><b>Council Meeting Agenda</b></p>	
	<p>Breakfast on your own. Recommend checking out of hotel and storing luggage if departing today.</p>	
<p>8:00 a.m.</p>	<p>Convene/Administrative Announcements</p>	<p>Chair</p>
<p>8:15</p>	<p>Bear Creek Dam Discussion</p>	<p>Warren Behlau, TVA</p>
<p>9:15</p>	<p>Explanation of TVA Questions</p>	<p>Janet Herrin</p>
<p>9:30</p>	<p><b>Public Comments</b></p>	
<p>10:30</p>	<p><b>Break</b></p>	
<p>10:45</p>	<p>Council Discussion of Questions and Documentation of Advice</p>	<p>Dave Wahus</p>
<p>12:15</p>	<p>Wrap up and Reminder of Next Meeting</p>	<p>Bruce Shupp</p>
<p>12:30 p.m.</p>	<p><b>Council Adjourns</b></p>	
	<p><b>Council Lunch in Room 407</b>            (Box lunches for your convenience)</p>	

**REGIONAL RESOURCE STEWARDSHIP COUNCIL**

**QUESTIONS RELATED TO TVA'S INFRASTRUCTURE STEWARDSHIP**

**AND EMERGENCY PREPAREDNESS AND COORDINATION EFFORTS**

TVA has mission-based responsibilities for stewardship of water and land-based resources and infrastructure throughout the Tennessee Valley. TVA conducts programs to maintain this infrastructure and to coordinate with appropriate local, state, and federal agencies in the event of emergencies.

At the May 2006 Regional Resource Stewardship Council meeting, TVA will provide information on these programs and ask the Council to respond to the following questions:

1. **How do you perceive the adequacy of TVA's infrastructure stewardship activities?**
2. **Do you have any suggestions for improvement in TVA's infrastructure stewardship activities?**
3. **How do you perceive the adequacy of TVA's emergency preparedness and coordination efforts with the U.S. Army Corps of Engineers and state and local agencies?**
4. **Do you have any suggestions for improvement in TVA's emergency preparedness and coordination efforts?**
5. **Has TVA considered a full range of options for Bear Creek Dam?**
6. **What other options should be considered?**

\*\*\*

Jere McCuiston  
Kentucky Emergency Management  
Hopkinsville, Kentucky

The duties of a Kentucky Emergency Manager are to:  
Provide technical assistance to county officials and emergency personnel in preparation and implementation of emergency plans, coordinate and manage the response activities at the scene of a disaster or emergency, conduct training programs for emergency personnel, present emergency preparedness programs to community organizations and schools, maintain accurate records of emergency procedures and responses, and work closely with federal and state emergency agencies.

Jere McCuiston, a native of Pembroke, Kentucky, has seventeen years of emergency management experience. He is a graduate of Murray State University. He and his wife of 35 years reside on the family farm near Trenton, Kentucky. They are the parents of two grown sons.



US Army Corps  
Of Engineers®

Nashville District  
P.O. Box 1070  
Nashville, TN 37202-1070

# Michael G. Ensch

## Chief, Operations Division

### *Biography*

- Present Position:* Chief, Operations Division, CELRN  
(May, 1999- present)
- Corps Experience:* Program Manager, Task Force Restore Iraqi  
Oil (RIO), Baghdad, Iraq (2003-04)  
Chief, Operations Division, Headquarters,  
U.S. Army Corps of Engineers (2002)  
Chief, Environmental Division, CESWF  
(Feb, 97-Jun, 98)  
Ass't Chief, Operations Division, CESWF (1996-99)  
Chief, Technical Support Branch, CESWF (1992-96)  
Executive Assistant, CESWD-ZX (Jan-Jun 91)  
Executive Assistant, CESWF-XO (Oct-Dec 90)  
Chief, Recreation-Resources Management Branch, CESWF (1988-92)  
Outdoor Recreation Planner, Natural Resources Management Branch,  
Headquarters, U.S. Army Corps of Engineers (1982-88)  
Park Manager-Clinton/Hillsdale Lakes, Kansas (1980-82)  
Chief Ranger-Clinton/Hillsdale Lakes, Kansas (1978-80)  
Park Ranger-Tuttle Creek Lake, Kansas (1974-77)
- Other Experience:* Staff member, President's Commission on Americans Outdoors  
(Nov-1985-Jan 1987)  
Staff Member, Water Resources Branch, Office of Management and  
Budget (Nov 1987-May 1988)
- Education:* Kansas State University, BS-Natural Resources/ Park Administration  
Slippery Rock University, Pennsylvania - Graduate Studies
- Professional:* Member, Board of Directors, National Society Park Resources (1988-91)
- Awards:* Meritorious Civilian Service Award, 2004  
Bronze Order of the *de Fleury* Medal, 2003  
Commander's Award for Civilian Service, 1999, 2000, 2002  
Achievement Medal for Civilian Service, 1995  
Performance Awards, USACE, 1987, 1989-thru-2004
- Memberships:* Ducks Unlimited  
National Recreation and Park Association  
Fort Worth-Arlington Swim Team Board of Directors

**TVA**

## Reservoir Operations Policy Update

Steve Adams

River Scheduling

**TVA**

## Reservoir Operations Study

- Initiated in October 2001
- Comprehensive review of how TVA operates its dams and reservoirs
- Purpose: to determine if changes in TVA's reservoir operating policy would produce greater overall public value
- Extensive public and agency input
- Detailed technical analysis
  - Water quality, flood risk, economic models
- New operating policy implemented in 2004

River Scheduling

**TVA**

## Major Changes – Tributary Reservoirs

- Limited drawdown from June 1 through Labor Day on 10 reservoirs, subject to:
  - Each project meeting its minimum flow requirement.
  - Each project providing a balanced share of the system flow requirement.
- Raised winter operating zones on 11 reservoirs.

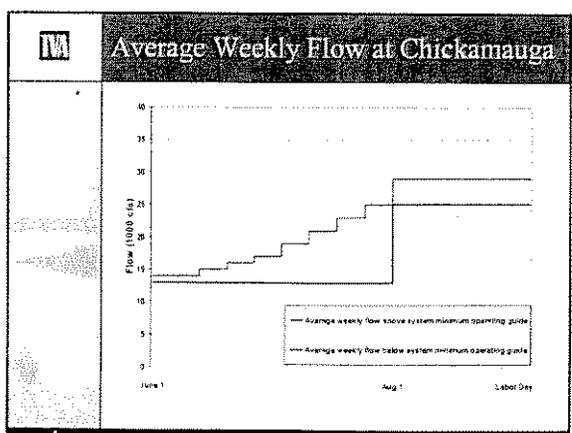
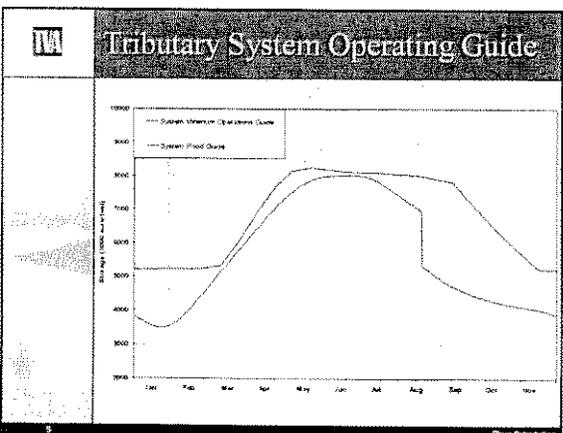
River Scheduling

**TVA**

## Tributary Reservoir Comparisons

Project	January 1 Median Increase (feet)	Labor Day Median Increase (feet)
South Holston	5.5	7
Watauga	10.5	7.5
Boone	8	0
Cherokee	13.5	11
Douglas	13	5.5
Norris	12	5
Fontana	11	13.5
Hiwassee	17	5.5
Chatuge	5	2
Nottely	15	6
Blue Ridge	7	4

River Scheduling



**TVA** **Major Changes – Main-River Reservoirs**

- Implemented a new two-stage fill operation on Fort Loudoun, Watts Bar, and Chickamauga
- Extended summer operating zones through Labor Day on Chickamauga, Gunterville, Wheeler, and Pickwick and through Nov. 1 on Watts Bar.
- Raised minimum winter pool elevation of Wheeler by six inches to ensure a minimum navigable channel depth.

7 River Scheduling

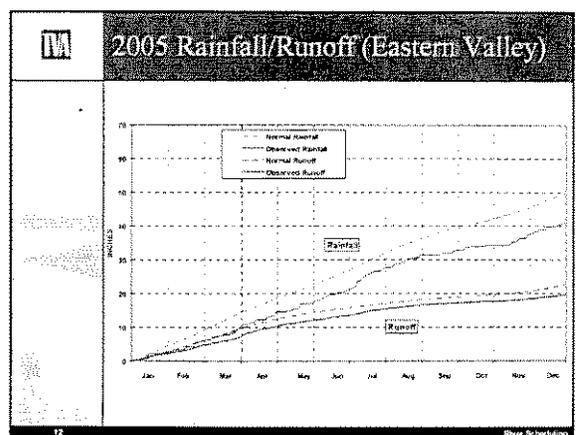
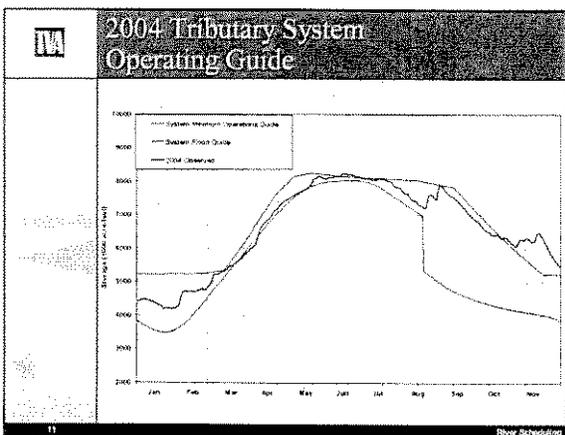
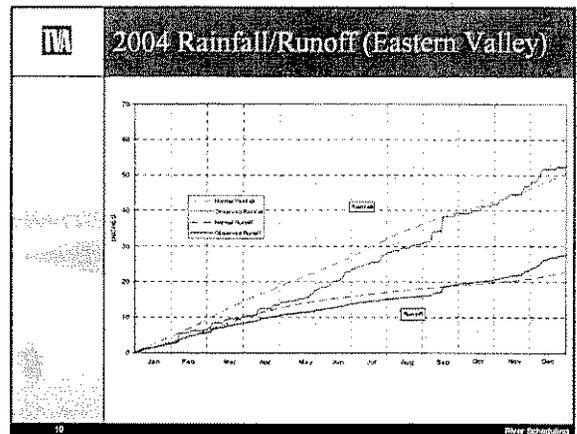
**TVA** **Additional Changes**

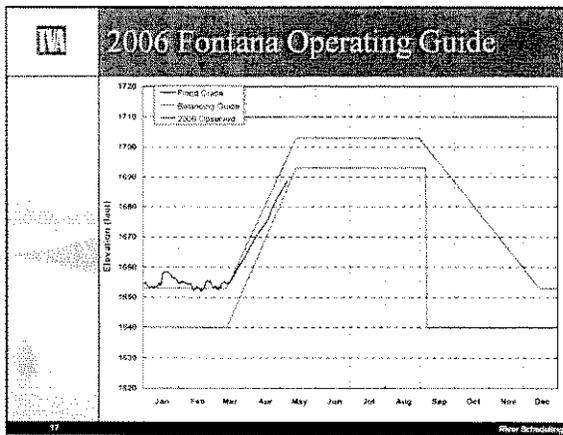
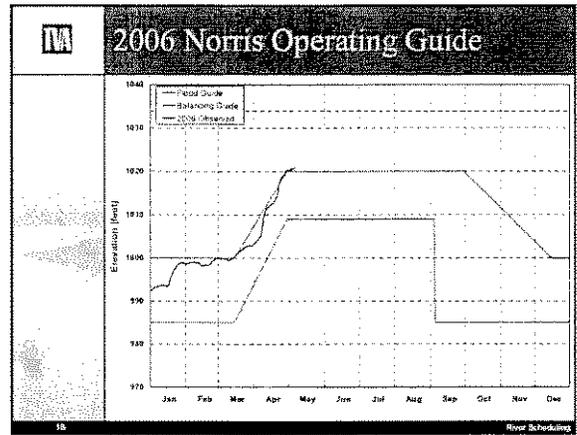
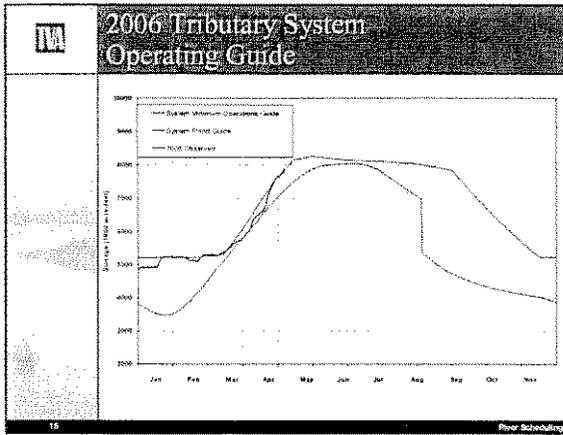
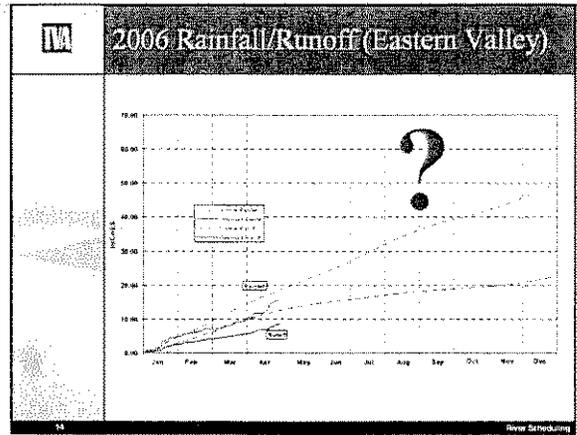
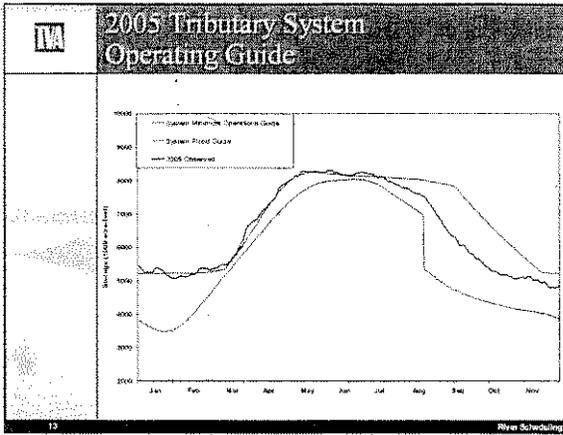
- Provided expanded and more dependable scheduled releases for tailwater recreation at Ocoee #1, Apalachia, Norris, Watauga/Wilbur, and South Holston.
- Increased flow below Kentucky Dam to benefit commercial navigation.
- Provided continuous minimum flows between Apalachia Dam and the powerhouse from June 1 through November 1 to enhance aquatic habitat.

8 River Scheduling

**TVA** **Operating Performance**

9 River Scheduling





### 2006 Outlook

- Forecast
  - Short-term
  - Long-term
- Potential impacts
  - Reservoir elevations
  - Hydropower generation
  - Water quality

18 River Scheduling



TVA.com

- Rainfall and runoff
- System minimum operating guide and flow requirements
- Tributary system storage
- Average weekly flows at Chickamauga Dam
- Individual project operating guides
- Observed and predicted releases and elevations at individual projects

18

River Scheduling

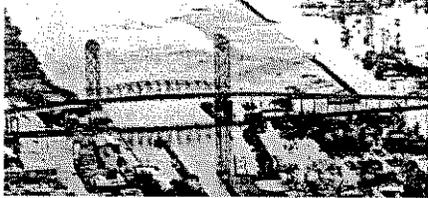
**TVA**

# Infrastructure Overview

Janet Herrin

1 River Operations

**TVA** **New Orleans Levee Break**



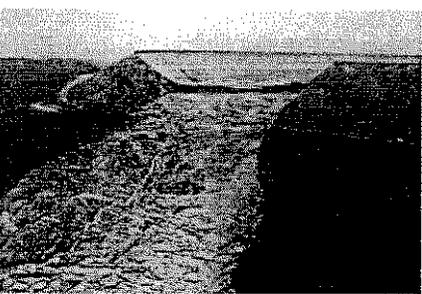
2 River Operations

**TVA** **Kauai Dam Break**



3 River Operations

**TVA** **Taun Sauk Reservoir Failure**



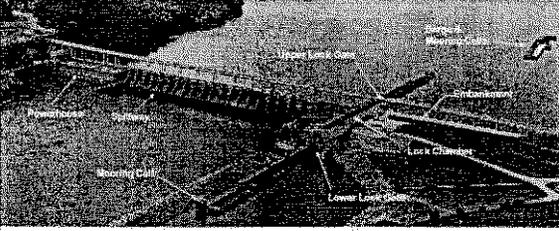
4 River Operations

**TVA** **TVA Watershed: Power and Non-Power Dams**



5 River Operations

# Infrastructure Inventory: Watts Bar Dam



6 River Operations

**TVA** **Related Water-Barrier Structures**

- Backwater protection stations
- Dewatering stations
- Saddle dams
- Dikes/berms
- Levees



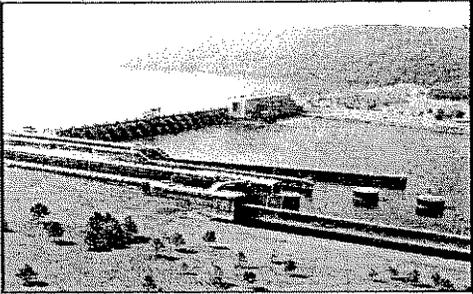
Crabapple backwater dike



Chattahoochee saddle dam

7 River Operations

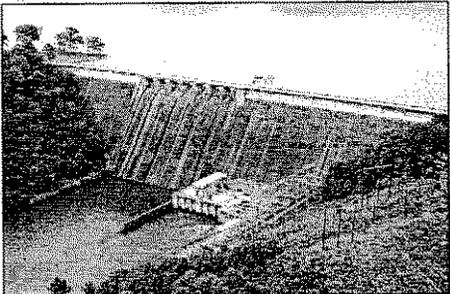
**TVA** **Dams: Main-River Multipurpose**



Guntersville Dam

8 River Operations

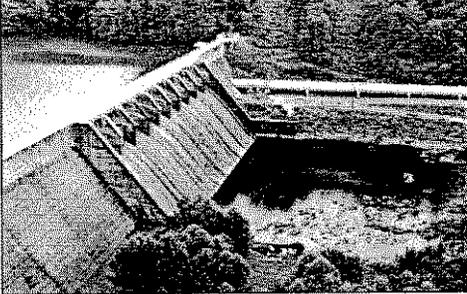
**TVA** **Dams: Tributary Multipurpose**



Hiwassee Dam

9 River Operations

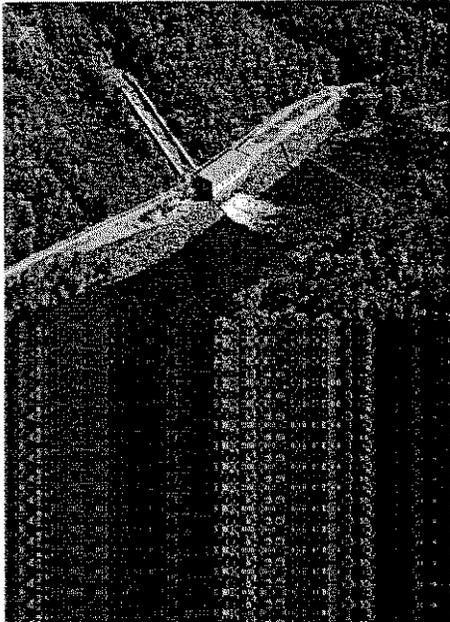
**TVA** **Dams: Tributary Run-of-River Power**



Apalachia Dam

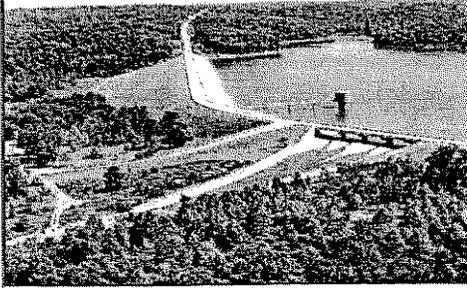
10 River Operations

**TVA** **Apalachia Powerhouse**



11 River Operations

**TVA** **Dams: Tributary Multipurpose Nonpower**



Little Bear Creek Dam

12 River Operations



**TVA** **Dams Acquired By TVA**

12 River Operations

**TVA** **14 Concrete Dams**

- Apalachia
- Douglas
- Fontana
- Fort Patrick Henry
- Great Falls
- Hiwassee
- Melton Hill
- Nolichucky
- Norris
- Ocoee No. 1
- Ocoee No. 3
- Wheeler
- Wilbur
- Wilson

Norris Dam

14 River Operations

**TVA** **12 Combined Concrete/Earthen Dams**

- Cherokee
- Chickamauga
- Fort Loudoun
- Guntersville
- Kentucky
- Nickajack
- Normandy
- Norris
- Pickwick Landing
- Tellico
- Watts Bar
- Boone

Chickamauga Dam

12 River Operations

**TVA** **21 Earthen Dams**

- Tims Ford
- Bear Creek
- Beaver Creek
- Beech
- Blue Ridge
- Cedar
- Cedar Creek
- Chatuge
- Clear Creek
- Watauga
- Doakes Creek
- Dogwood
- Little Bear Creek
- Lost Creek
- Pin Oak
- Pine
- Redbud
- Sycamore
- Upper Bear Creek
- Nottely
- South Holston

18 River Operations

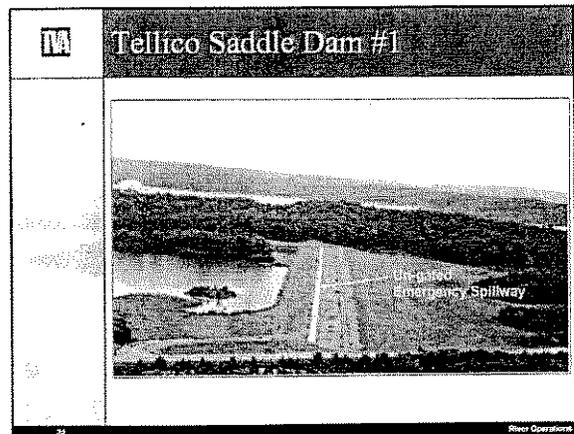
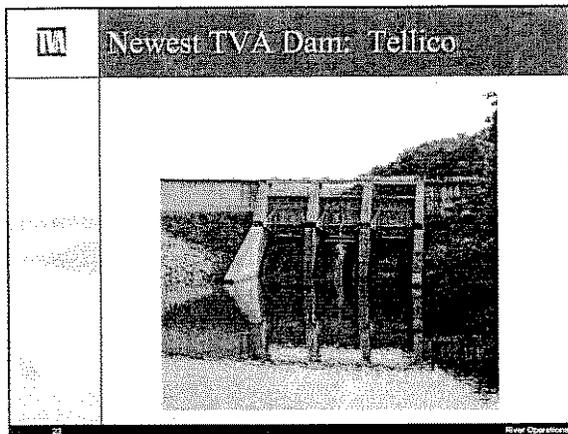
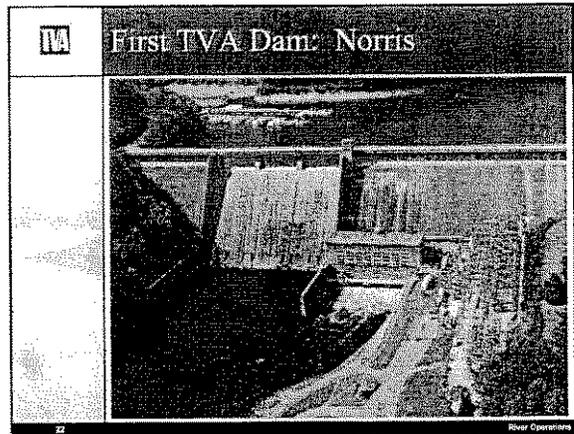
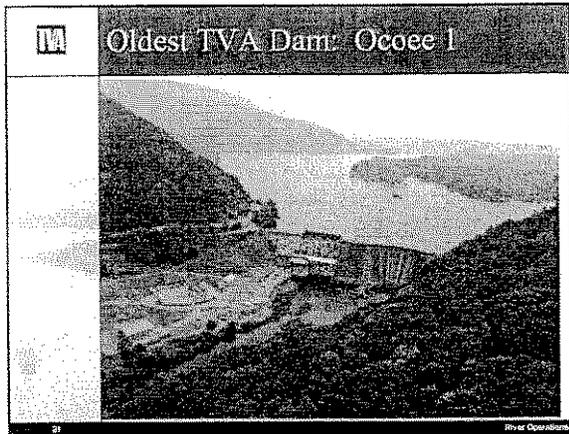
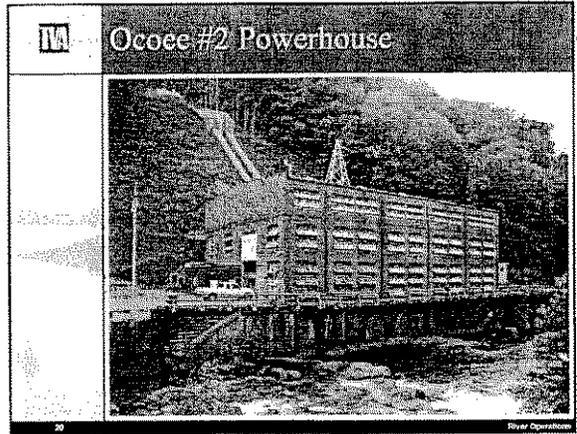
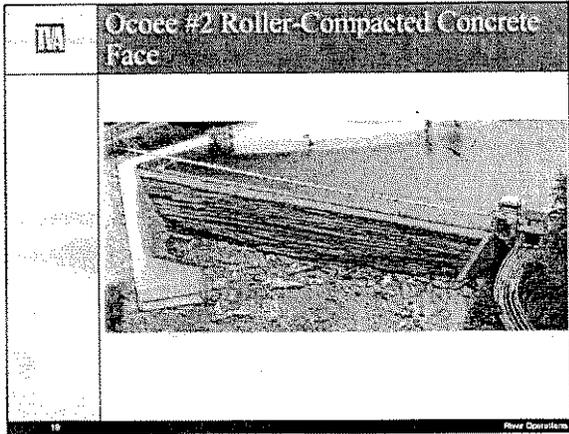
**TVA** **South Holston Dam**

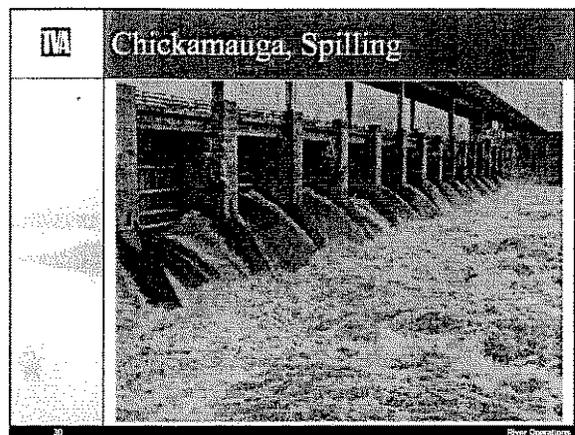
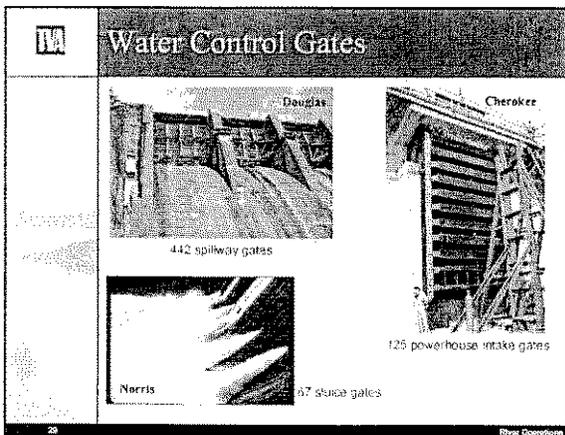
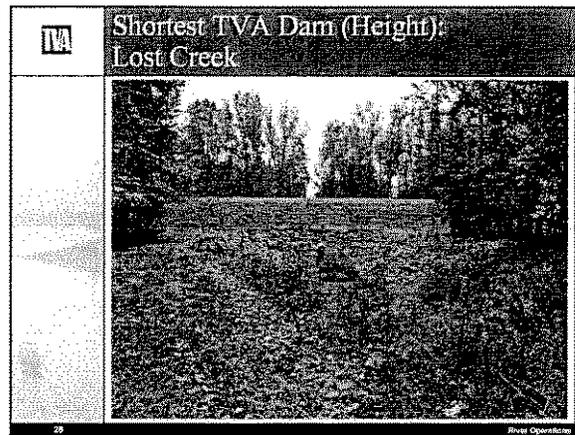
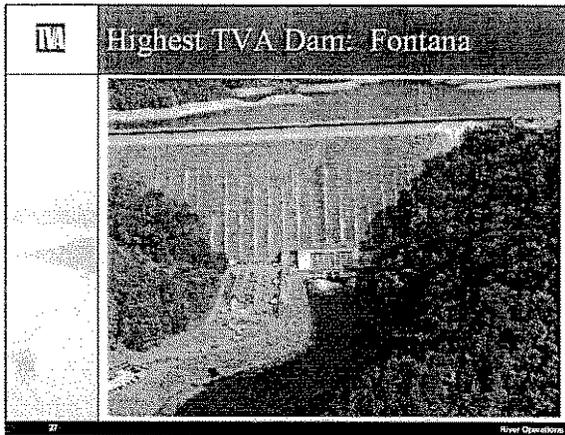
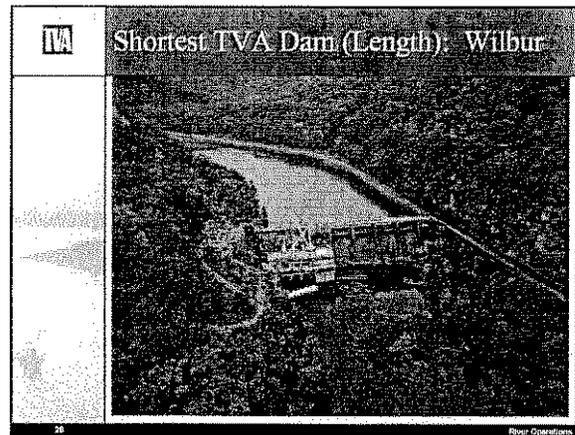
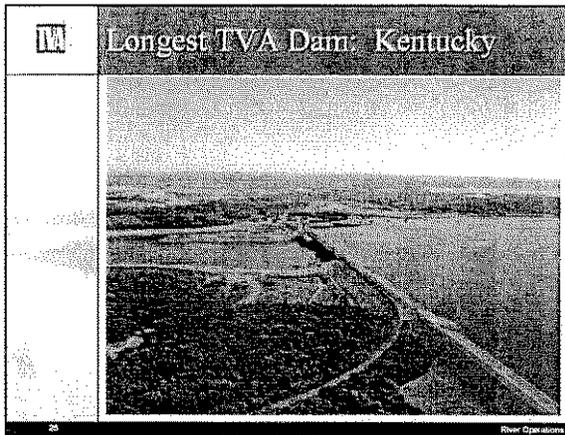
17 River Operations

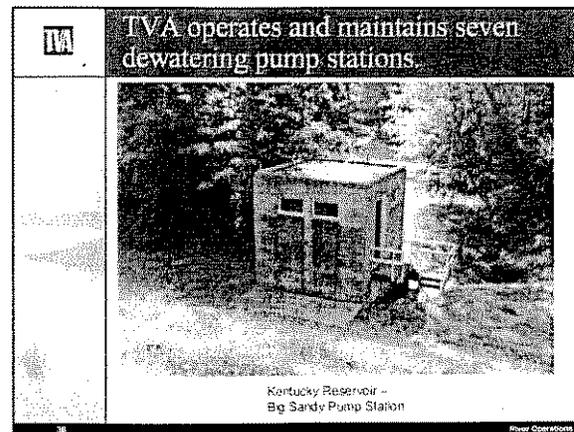
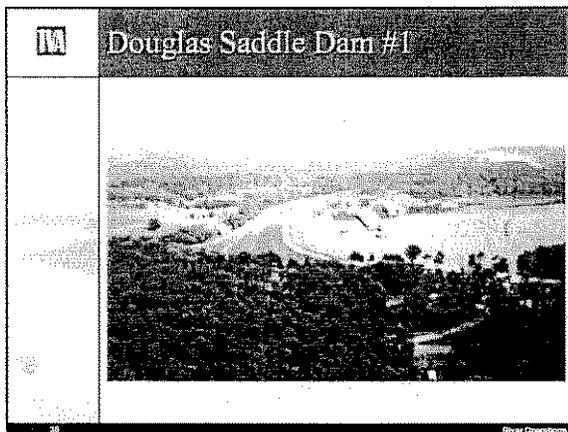
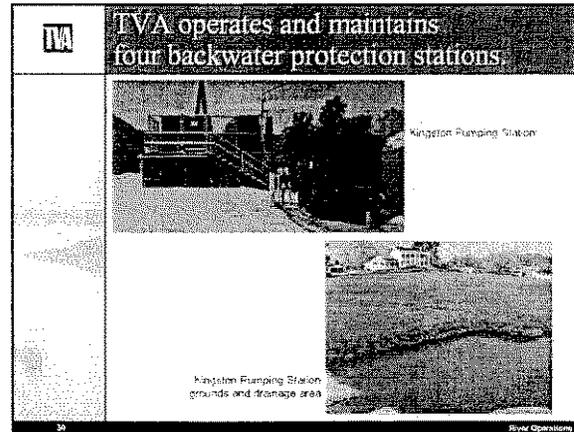
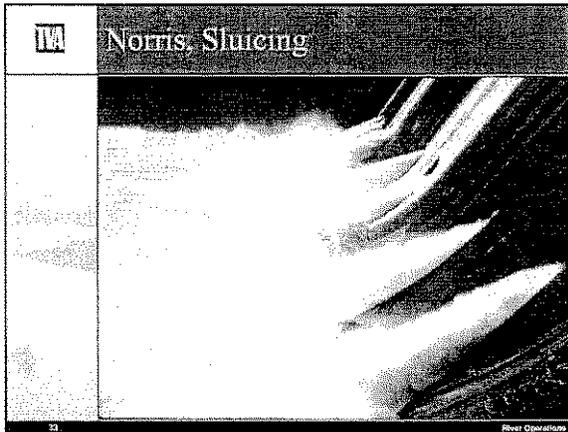
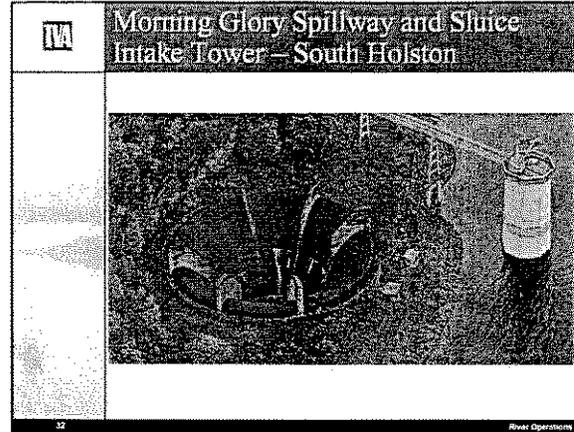
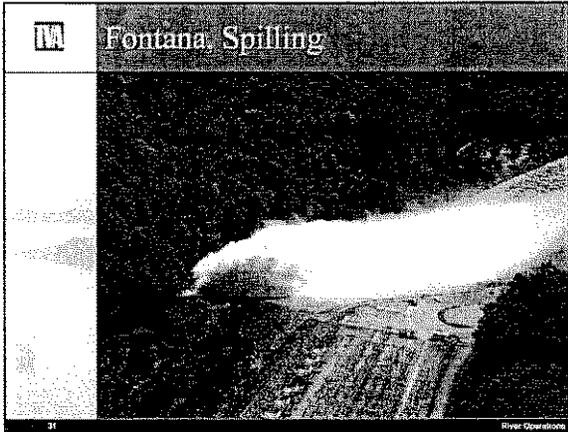
**TVA** **1 Rock-Filled Timber Crib Dam**

Ocoee #2 Dam

16 River Operations







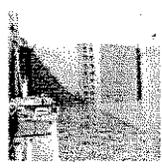
**TVA** **Navigation Infrastructure**

- TVA owns the locks and other navigation infrastructure and manages the overall system.
- USACE operates the locks and provides maintenance dredging on the main channel.
- TVA and USACE share responsibilities for lock maintenance.
- TVA has dam safety responsibility for the locks and any modifications or additions.
- USACE takes the lead on major capital projects, such as new locks at Kentucky and Chickamauga.
  - TVA works in partnership to support these efforts.

27 River Operations

**TVA** **Navigation Infrastructure**

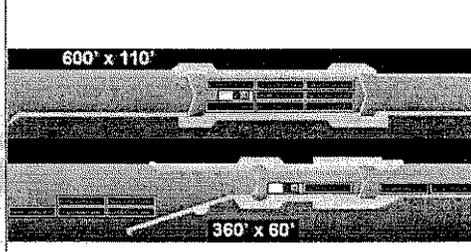
Lock location	Lock size (feet)
Kentucky	600 x 110
Pickwick Main	1960 x 110
Pickwick Auxiliary	670 x 110
Wilson Main	600 x 110
Wilson Auxiliary	370 x 60
Wheeler Main	600 x 110
Wheeler Auxiliary	470 x 60
Guntersville Main	600 x 100
Guntersville Auxiliary	360 x 60
Suckapaak	600 x 110
Chickamauga	360 x 60
Watts Bar	360 x 60
Fort Loudon	350 x 60
Melton Hill	400 x 75



Wilson Main Lock

28 River Operations

**TVA** **Lock Capacity**



600' x 110'

360' x 60'

29 River Operations

**TVA** **Navigation Infrastructure, continued**

- 10 operations buildings and workshops
- 51 mooring cells

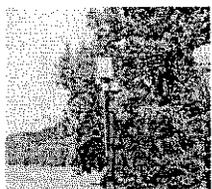


30 River Operations

**TVA** **Commercial Channel Passing Daymarks/Daybeacons**



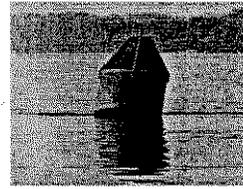
Marks the right side of the channel as you travel upstream.



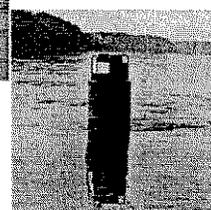
Marks the left side of the channel as you travel upstream.

41 River Operations

**TVA** **Buoys**



Red buoy marks the right channel limit.



Green buoy marks the left channel limit.

42 River Operations

**TVA** **Other Navigation Aids**

- Navigation lights
- Fingerboards
- Hazard buoys



Red Commercial Channel markers of Down-Reach buoys. Channel buoys are a wide stretch of the reservoir from the right bank to the left bank as you travel upstream.

43 River Operations

**TVA** **Navigation Infrastructure, continued**

- 54 channel navigation staff gages
- 1626 buoy reference ranges

44 River Operations

**TVA** **TVA's Navigation Service Boat**



45 River Operations

**TVA** **TVA maintains 92 bridges.**

Number by state

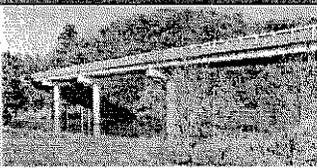
- Alabama: 23
- Georgia: 5
- Kentucky: 5
- Mississippi: 1
- North Carolina: 5
- Tennessee: 53



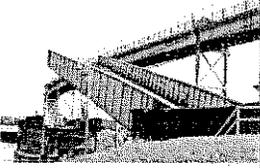
Wheeler Reservoir bridge  
(1.23 miles long)

46 River Operations

**TVA** **43 Roadway Bridges**



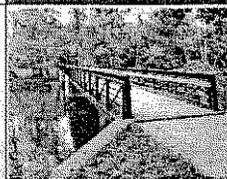
Telfico



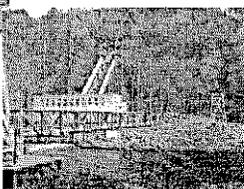
Wilson

47 River Operations

**TVA** **41 Footbridges**



Osceola Footbridge,  
South Holston



Apalachia

48 River Operations

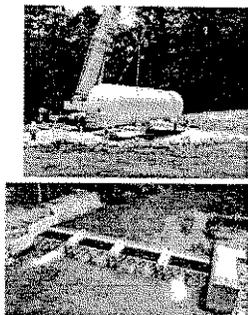
**TVA** **Other Bridges**

- Seven lock/service bridges
- One railroad bridge

40 River Operations

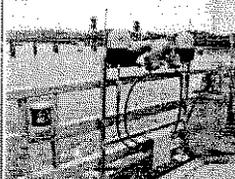
**TVA** **Aeration Systems**

- Installed at 15 dams
- Technologies vary by dam:
  - Aerating weirs
  - Oxygen injection systems
  - Surface-water pumps
  - Aerating turbines

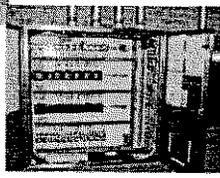


41 River Operations

**TVA** **Tailwater Warming Systems**



Chickamauga Hydro Plant  
Tailwater Warming System

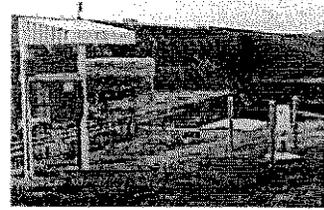


Apalachia Hydro Plant  
Tailwater Warming System  
Control Station

42 River Operations

**TVA** **Rain and Stream Gages**

- 247 rainfall gages
- 62 stream gages



43 River Operations

**TVA** **Recreation Infrastructure**




44 River Operations

**TVA** **Natural Resource Assets**

- 293,000 acres of public land
- 11,000 miles of public shoreline
- 800 miles of navigable waterway
- 650,000 surface acres of water
- 82 designated natural areas



45 River Operations

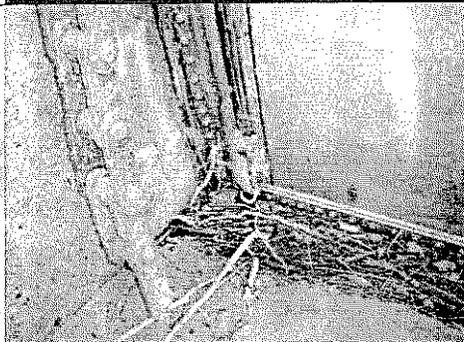
**TVA**

# Infrastructure Stewardship

Jerry Gibson

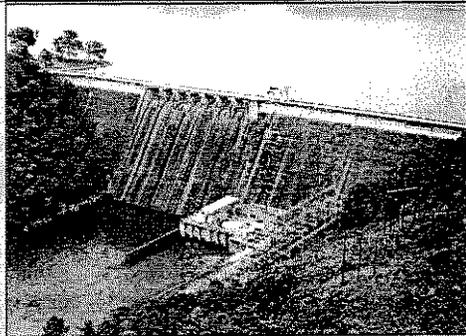
River Operations

**TVA** **Broken Chain**



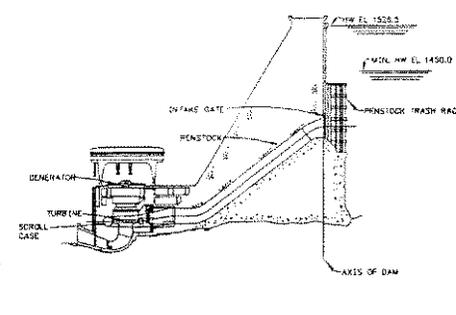
River Operations

**TVA** **Hiwassee Dam**



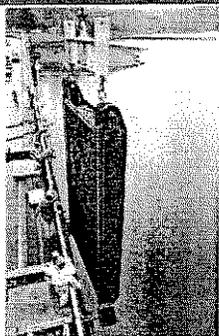
River Operations

**TVA** **Hiwassee Dam Cross Section**



River Operations

**TVA** **Removing Damaged Hiwassee Intake Gate**



River Operations

**TVA** **Infrastructure Stewardship Activities**

- Inspections
- Assessments
- Maintenance
- Major projects

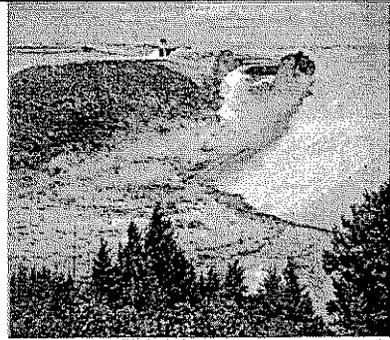
River Operations

**TVA** Water-Barrier Infrastructure

- Dams
- Water control gates
  - Spillway gates
  - Sluice gates
  - Intake gates
- Backwater protection and dewatering stations

7 River Operations

**TVA** Teton Dam Failure, 1976



8 River Operations

**TVA** Federal Guidelines for Dam Safety

- Developed by USACE, Bureau of Reclamation, FERC, and TVA.
- Issued by FEMA in 1979 after the failure of Teton Dam.
- Establishes criteria to ensure that dams:
  - Can safely pass a probable maximum flood (PMF).
  - Withstand a maximum credible earthquake (MCE).
- 83% of TVA dams are classified as "high hazard" based on:
  - Height of the dam
  - Impoundment volume
  - Downstream development

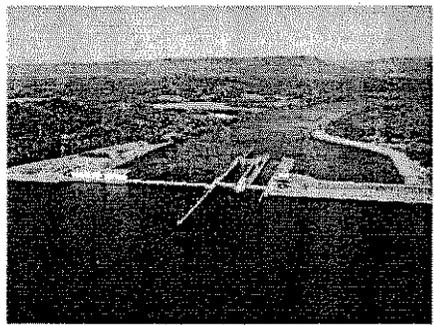
9 River Operations

**TVA** Dam Safety Modifications

- All 49 dams have been evaluated for Probable Maximum Flood and Maximum Credible Earthquake.
- No modifications were required for 26 dams.
- 21 modifications have been completed.
- Two modifications are under review.
  - Chickamauga
  - Bear Creek

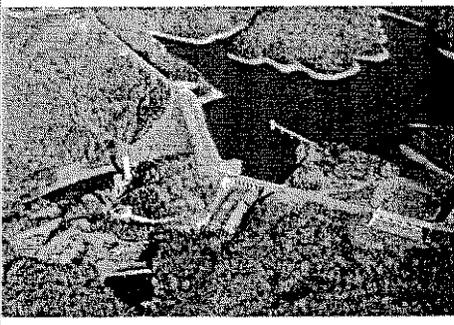
10 River Operations

**TVA** Nickajack Dam

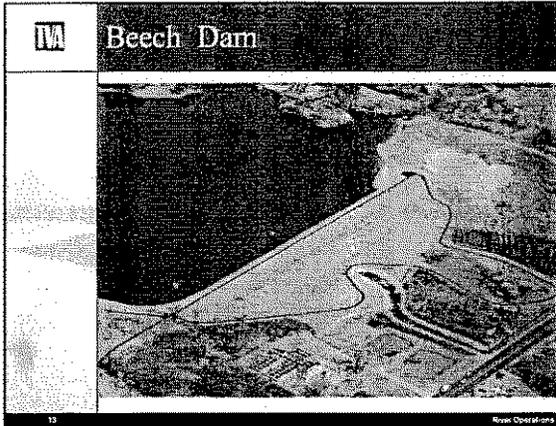


11 River Operations

**TVA** Blue Ridge Dam



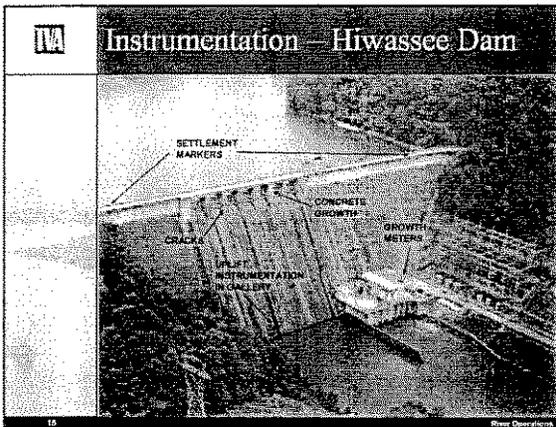
12 River Operations



### Dam Safety Instrumentation

- Equipment is installed at all TVA dams to:
  - Monitor dam performance
  - Investigate specific problems
- Data collection includes:
  - Settlement
  - Uplift
  - Groundwater levels
  - Crack openings
  - Concrete growth
- Data is evaluated on a real-time basis

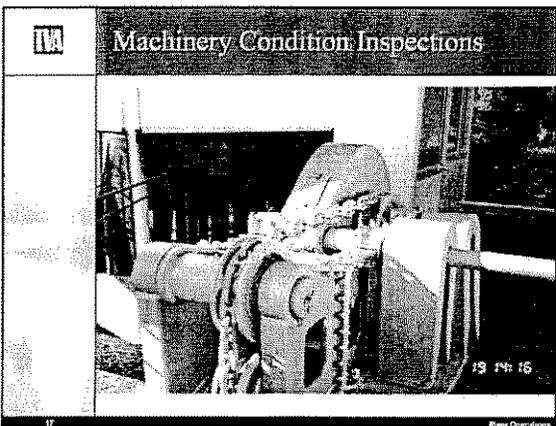
14 River Operations



### Dam Safety Inspections

- Conduct comprehensive inspections of all dams every five years.
  - Machinery condition inspections and testing
  - Diving inspections
  - Remote-Operated Vehicle (ROV) inspections
  - Rope access inspections
  - Lock and spillway gate inspections

16 River Operations



**TVA** Comprehensive Inspection Checklist — Fort Loudoun Hydro Plant

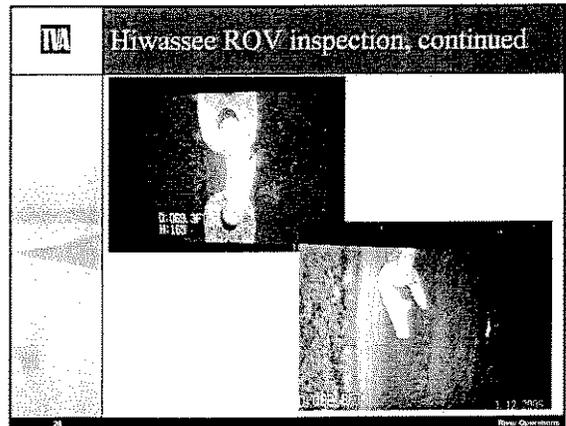
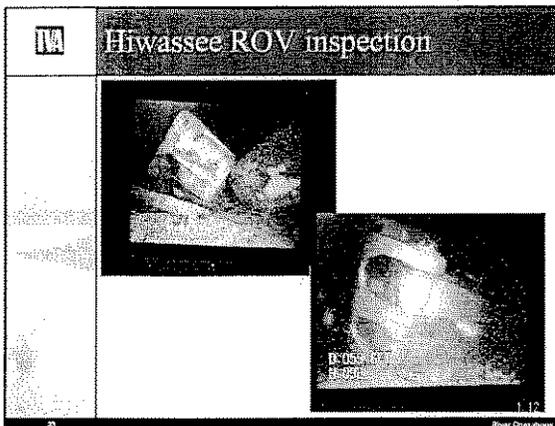
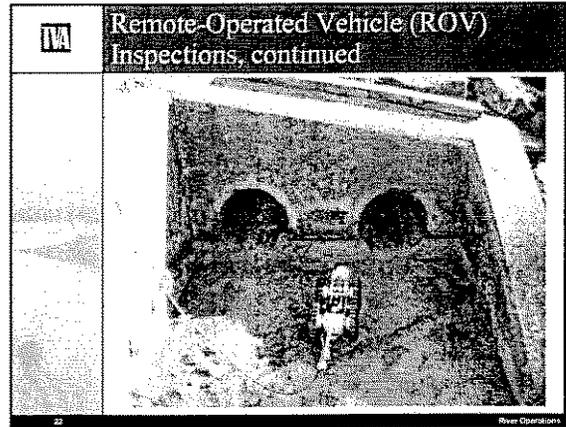
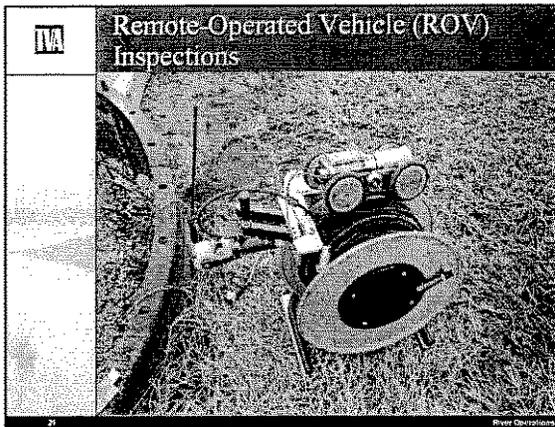
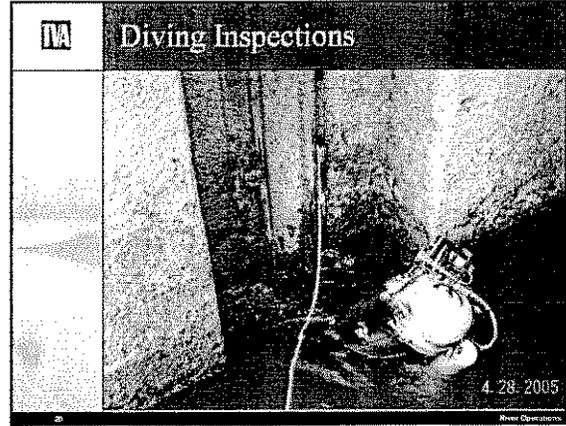
- Right Embankment Dam (including Abutment)
  - Upstream Face
    - Slope Protection
    - Erosion
    - Sinkholes, Depressions
    - Vegetation
  - Downstream Face
    - Slope Protection
    - Erosion
    - Sinkholes, Depressions
    - Seeps
    - Top Drain Outlets #1 and #2 (Along Downstream Shoulder)
    - Miscellaneous Penetrations through Dam
  - Spillway Section
    - Upstream and Downstream Face
      - Surface Condition of concrete
      - Cracks, Spalls
      - Block Movement at Joints
      - Leakage
      - Erosion
      - Miscellaneous Penetrations through Dam
    - Deck
      - Surface Condition of concrete
      - Cracks, Spalls
      - Deck Offsets
      - Joint Wear
      - Condition of Fasteners and Joints
- Piers, Training Walls
  - Surface Condition of concrete
  - Cracks, Spalls
  - Erosion
  - Block Movement at Joints
- Spillway Deck
  - Surface Condition of concrete
  - Cracks, Spalls
  - Deck Offsets
  - Joint Wear
  - Condition of Fasteners and Joints
- Non-overflow Section
  - Upstream and Downstream Face
    - Surface Condition of concrete
    - Cracks, Spalls
    - Block Movement at Joints
    - Leakage
    - Erosion
    - Miscellaneous Penetrations through Dam

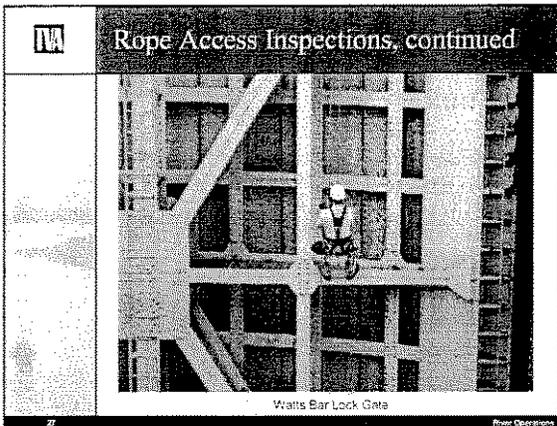
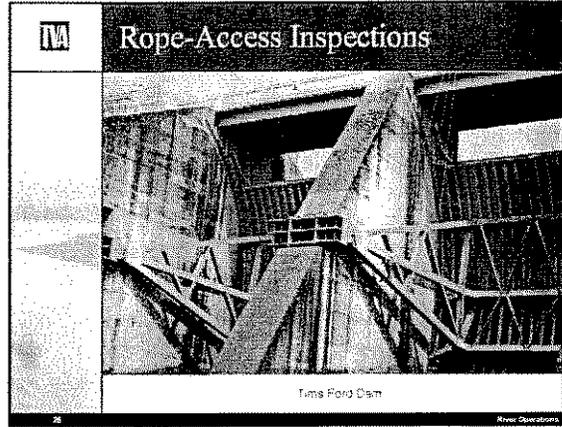
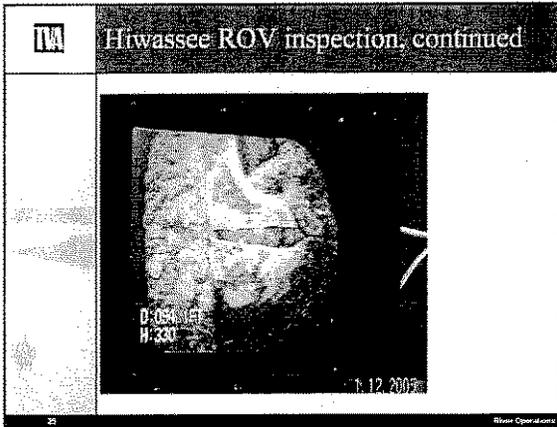
18 River Operations

**TVA** **Comprehensive Inspection Checklist – Fort Loudoun Hydro Plant, continued**

<ul style="list-style-type: none"> <li>- Intake and Powerhouse:             <ul style="list-style-type: none"> <li>- Upstream and Downstream Face</li> <li>- Surface Condition of concrete</li> <li>- Cracks/ Spalls</li> <li>- Block Movement of Joints</li> <li>- Erosion</li> <li>- Leakage</li> <li>- Miscellaneous Penetrations through Dam</li> </ul> </li> <li>- Intake Deck:             <ul style="list-style-type: none"> <li>- Surface Condition of concrete</li> <li>- Cracks/ Spalls</li> <li>- Block Movement of Joints</li> <li>- Joint Filler</li> </ul> </li> <li>- Draft Tube Deck:             <ul style="list-style-type: none"> <li>- Surface Condition of concrete</li> <li>- Cracks/ Spalls</li> <li>- Wall Offsets</li> <li>- Joint Filler</li> </ul> </li> <li>- Exterior of Powerhouse:             <ul style="list-style-type: none"> <li>- Surface Condition of concrete</li> <li>- Cracks/ Spalls</li> <li>- Wall Offsets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Interior of Powerhouse, Service Bay:             <ul style="list-style-type: none"> <li>- Substructure</li> <li>- Superstructure</li> <li>- Cracks/ Spalls</li> <li>- Wall Offsets</li> <li>- Miscellaneous Penetrations through Dam</li> </ul> </li> <li>- Foundation Drain Gallery:             <ul style="list-style-type: none"> <li>- Surface Condition of concrete</li> <li>- Cracks/ Spalls</li> <li>- Block Movement at Joints</li> <li>- Leakage</li> <li>- Flow from Foundation Drain</li> <li>- Sound Foundation Drains and Record as Drawing DWG020</li> </ul> </li> </ul>
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4 28 2005





**TVA** Other Dam Safety Inspections

- Conduct intermediate inspections.
- Conduct walk-downs monthly.
- Conduct special inspections after significant earthquake or flooding events.

28 River Operations

**TVA** Intermediate Inspection Checklist — Fort Loudoun

SERVICE BAY	
UPSTREAM FACE	1
DOWNSTREAM FACE	2
TOUR	3
SECURITY BARRIER	4
ADDITIONAL COMMENTS	
SERVICE BAY	
TOUR	5
SECURITY BARRIER	6
ADDITIONAL COMMENTS	
WALK-DOWN	
TOUR	7
SECURITY BARRIER	8
ADDITIONAL COMMENTS	

29 River Operations

**TVA** Monthly Inspection Checklist

USE THE FOLLOWING GUIDELINES DURING THE MONTHLY INSPECTION:  
 1. LOOK FOR ANY NEW CRACKING OR IMPAIRMENTS ON CONCRETE STRUCTURES.  
 2. WALK ALONG THE TOE AND DITCH AREA OF THE UPSTREAM DAM.  
 WATCH FOR ANY NEW SEEPS, SOIL AREAS, SETTLEMENTS OF SANDS.

FEATURES TO BE INSPECTED

UPSTREAM SECTION

- UPSTREAM FACE
- DOWNSTREAM FACE
- TOUR
- SECURITY BARRIER
- BRIDGE DECK
- TOUR
- SECURITY BARRIER

DOWNSTREAM SECTION

- DOWNSTREAM FACE
- TOUR
- SECURITY BARRIER

ADDITIONAL COMMENTS

30 River Operations

**TVA** **Dam Safety – Maintenance**

Chickamauga Spill. May 2003

21 River Operations

**TVA** **Watts Bar Spillway Gate Repairs**

12/2/1999

Watts Bar Spillway Gate Repairs

22 River Operations

**TVA** **Major Projects – Gates, Guides, and Seals Program**

2005

Hiwassee intake gate – “as found” condition

23 River Operations

**TVA** **Refurbished Hiwassee Intake Gate**

24 River Operations

**TVA** **Major Projects – Coatings Program**

Douglas scrollcase - before

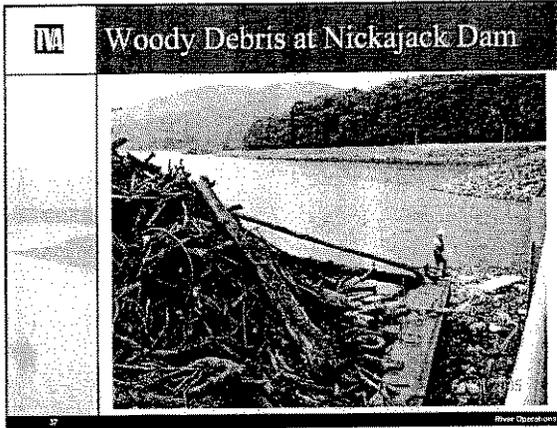
Douglas scrollcase - after

25 River Operations

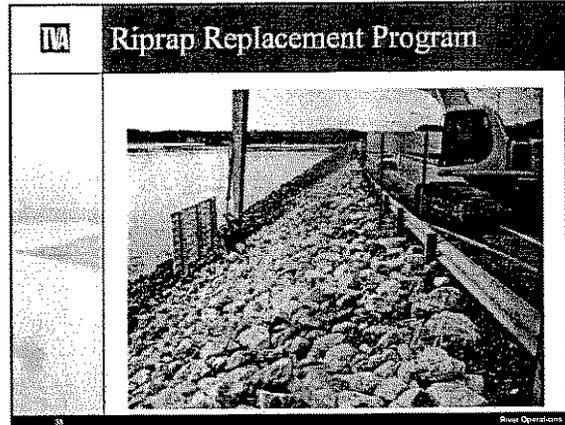
**TVA** **Trash Racks Program**

3-26-2005

26 River Operations



**TVA** Woody Debris at Nickajack Dam



**TVA** Riprap Replacement Program

**TVA** Dam Safety – Emergency Preparedness

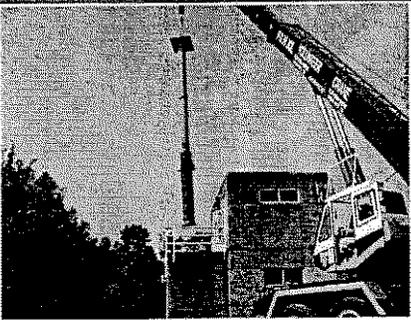
- Conduct periodic emergency drills
- Maintain a dam safety emergency centers
- Publish Emergency Action Plans for all dams in coordination with local Emergency Management Agencies



**TVA** Hydro Board of Consultants

- Independent board of internationally recognized experts in dam engineering
- Duties are to assist TVA in:
  - Ensuring the safety of TVA dams and consistency with industry practice and standards
  - Maximizing the returns on investments in analysis and upgrade of TVA dams
  - Finding practical and innovative solutions to dam engineering problems
  - Integrating new philosophies into TVA's dam safety program

**TVA** Backwater Protection and Dewatering Stations

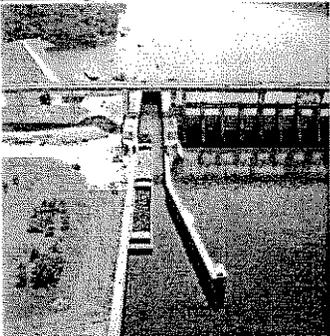


Big Sandy Pump House – Removing 24' x 37' long pump for repairs

**TVA** Backwater Protection and Dewatering Stations, continued

- Maintenance activities:
  - Maintain and ensure operation of the pumps
  - Remove debris from pump station grates
  - Maintain the spillways
  - Maintain riprap stone
  - Cut trees and other vegetation; apply herbicide to control woody growth
  - Mow and maintain area
  - Provide pest control
- Inspect dikes and slopes for leakage

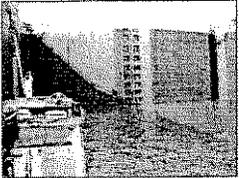
**TVA** **Navigation Infrastructure Stewardship – Chickamauga Lock**



43 River Operations

**TVA** **Lock Inspection Schedule**

- Three-year frequency:
  - Chickamauga
- Five-year frequency:
  - Guntersville Main and Auxiliary
  - Wheeler Main
  - Wilson Main
  - Pickwick Main and Auxiliary
  - Kentucky
- Ten-year frequency, with midway diving inspection:
  - Ft. Loudoun
  - Watts Bar
  - Nickajack
  - Wheeler Auxiliary
  - Wilson Auxiliary
  - Melton Hill



Wilson Main Lock

44 River Operations

**TVA** **Navigation Aids**

- US Army Corps of Engineers constructs and maintains mooring cells.
- TVA assists with design and cost of materials.



Decatur, Alabama, Mooring Cells

45 River Operations

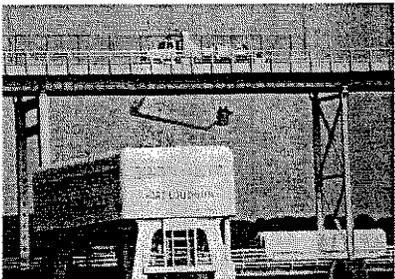
**TVA** **TVA Bridge Program**

- Purpose:
  - Ensure bridge safety
  - Meet federal requirements
  - Preserve our investment
  - Serve commerce, the public, and TVA
- TVA responsibilities include:
  - Inspection
  - Rating
  - Load limit posting
  - Special loads
  - Design
  - Seismic loading
  - Maintenance
  - Modifications

46 River Operations

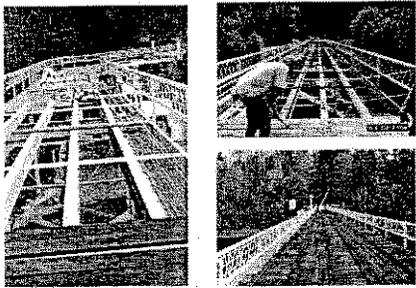
**TVA** **Bridge Inspection**

Inspection frequency: 1-2 years

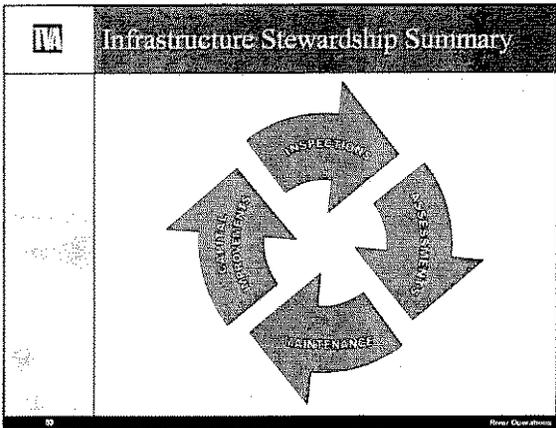
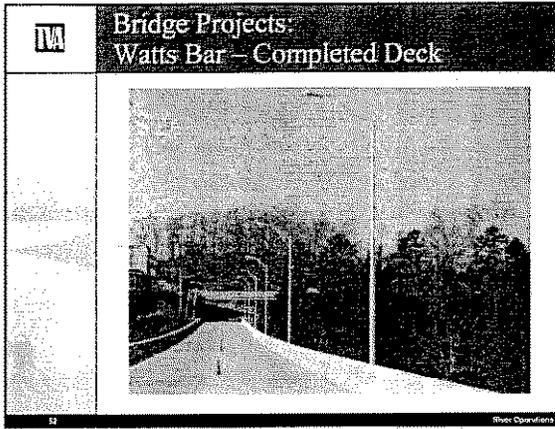
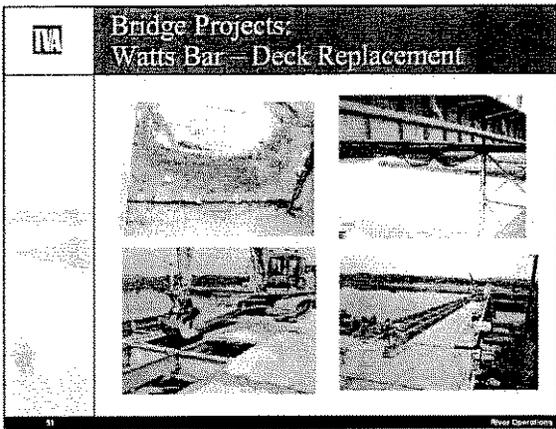
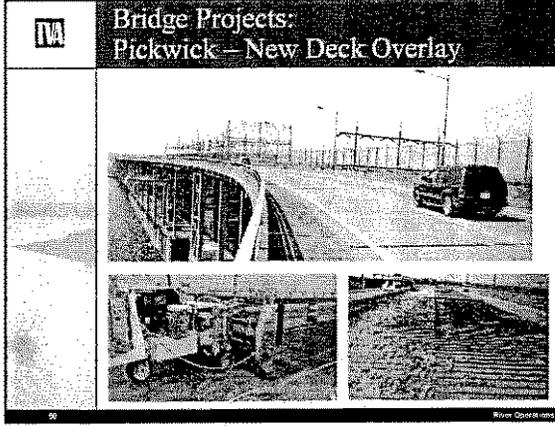
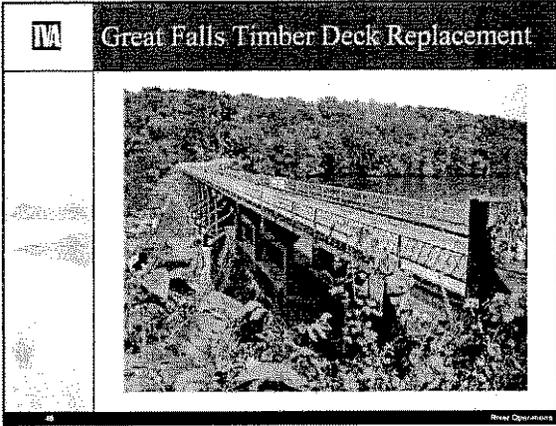


47 River Operations

**TVA** **Bridge Projects: Great Falls – Deck Replacement**



48 River Operations



**TVA**

## Special Infrastructure Issues

Gary Brock

River Operations

**TVA**

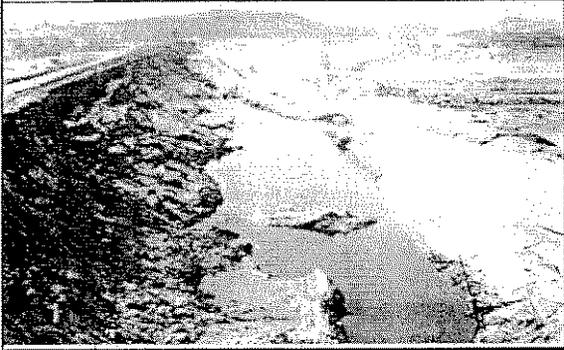
### Special Infrastructure Issues

- Seismic hazard
- Concrete growth

River Operations

**TVA**

### Lower San Fernando Dam, 1971



River Operations

**TVA**

### Lower San Fernando Dam, 1971

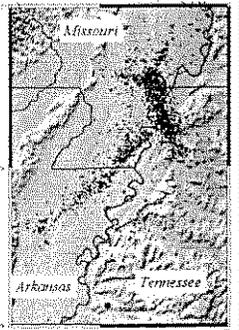


River Operations

**TVA**

### New Madrid Seismic Zone

- Evidence of multiple large sequences of earthquakes about every 500 years.
- Most important source of earthquake hazard for the Tennessee Valley.

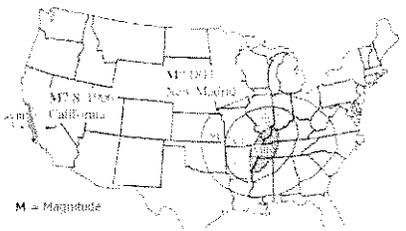


River Operations

**TVA**

### Winter, 1811-1812

The New Madrid seismic zone experienced three major earthquakes.



M = Magnitude

River Operations

**TVA** **Mississippi River, 1812**

"In descending the Mississippi on the night of the 6<sup>th</sup> February, we tied our boat to a willow bar on the west bank of the river. About 3 o'clock on the morning of the 7<sup>th</sup>, we were waked by the violent agitation of the boat, attended with a noise more tremendous and terrific than I can describe. As soon as we waked we discovered that the bar to which we were tied was sinking, we cut loose and rowed our boats for the middle of the river.

At daylight we perceived the head of the tenth Island. During all this time we had made only about four miles down the river. *It is evident that the earth at this place or below, had been raised so high as to stop the progress of the river, and cause it to overflow its banks.* We took the right hand channel of the river at this island, and were affrighted with the appearance of a dreadful rapid or falls in the river just below us."

Matthias Speed

7 River Operations

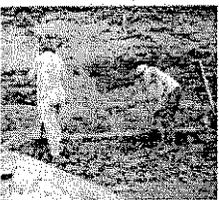
**TVA** **Around 1904**



8 River Operations

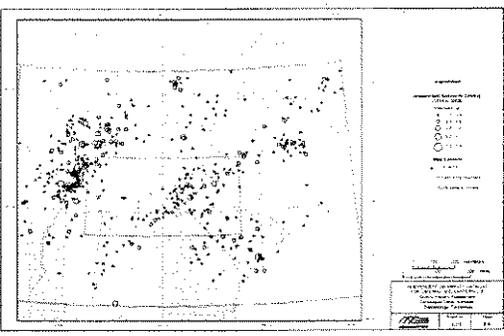
**TVA** **Lessons Learned**

- Earthquakes large enough to cause widespread liquefaction happen every few hundred years in the New Madrid seismic zone.
- In addition to the 1811-12 events, there were at least two strong ground shaking earthquakes in the past 2000 years (A.D. 1450±135 and A.D. 900 ±100).
- There is evidence at several sites of significant earthquakes prior to A.D. 900.



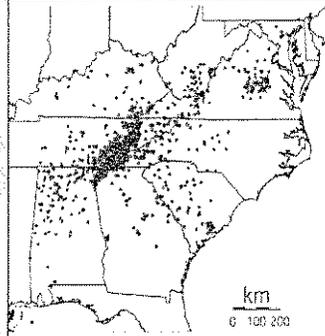
9 River Operations

**TVA** **Regional Seismic Activity and Important Sources**



10 River Operations

**TVA** **Southeastern U.S. Seismic Activity, 1977-Present**



- Zone of persistent, small to moderate magnitude earthquakes in eastern TN, northwestern GA, and northeastern AL.
- No large (magnitude > 6) earthquakes in historic time.
- Largest contributor to high frequency ground motion for most TVA hydro sites.

11 River Operations

**TVA** **October 1936 TVA Report: Earthquakes in the Vicinity of the Tennessee Valley**

"The data assembled and presented in this report clearly indicates that *the possibility of severe shocks in this area in the future should be considered in the design of dams.* The data also shows that there is no particular justification for lessening the assumed acceleration to be used in earthquake resistant design in this part of the country."

12 River Operations

**TVA** **March 1937 Report: Earthquake Hazard to Dams in the Tennessee Valley**

Hydro Board of Consultants –  
Summary of conclusions:

"It is our conclusion that the factor of stresses due to earthquake vibrations may be omitted in designing dams in the upper portion of the drainage area of the Tennessee River down to and including Guntersville, and that in the design of structures in the lower river below Guntersville provision should be made for stresses arising from earthquakes."

13 River Operations

**TVA** **Seismic Design of Hydro Facilities**

- 1939 – Kentucky Dam is the only TVA dam originally designed for earthquake shaking.
- 1977 – Advent of Federal Dam Safety Program results in review of expected performance of TVA dams during earthquakes.
- 2004 – TVA Dam Safety study re-assesses earthquake hazard levels.

14 River Operations

**TVA** **Dam Safety Seismic Hazard Assessment**

- Performed by Geomatrix in 2004.
- Updated 1992 seismic hazard study.
- Computed probabilistic seismic hazard for entire TVA region.
- Site-specific seismic hazard values determined for all TVA dams.

15 River Operations

**TVA** **Ground Shaking Hazard – Low Frequency**

16 River Operations

**TVA** **Ground Shaking Hazard – High Frequency**

17 River Operations

**TVA** **Blue Ridge Dam**

18 River Operations

**TVA** **Summary: Seismic Issues**

- Earthquake hazard in TVA region:
  - Primarily from New Madrid seismic zone
  - Lesser extent from East Tennessee seismic zone
- Concrete dams perform better during earthquake shaking than earthen dams.
- Seismic evaluation of Blue Ridge Dam in progress.
- Seismic re-evaluations of other dams also may be performed.

19 River Operations

**TVA** **Concrete Growth**

- Also called alkali-aggregate reaction (AAR).
- Occurs when the alkalis contained in cement react with certain naturally occurring minerals in the concrete aggregate.
- The slight increase in the volume of concrete causes disruptive movements in large/long concrete structures over long periods of time.

20 River Operations

**TVA** **Affected TVA Projects**

21 River Operations

**TVA** **Concrete Growth Control Measures**

Slot cutting      Post-tensioning

22 River Operations

**TVA** **AAR Problems at Fontana Dam**

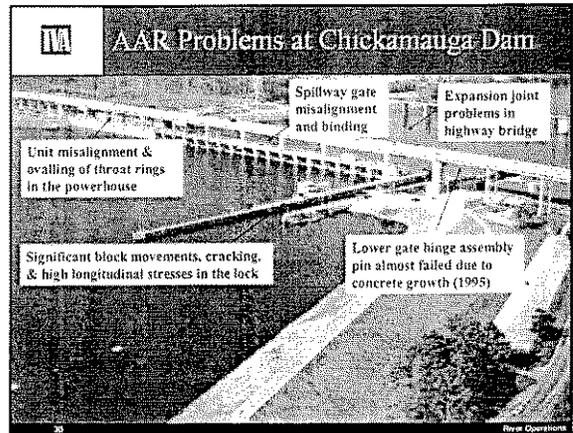
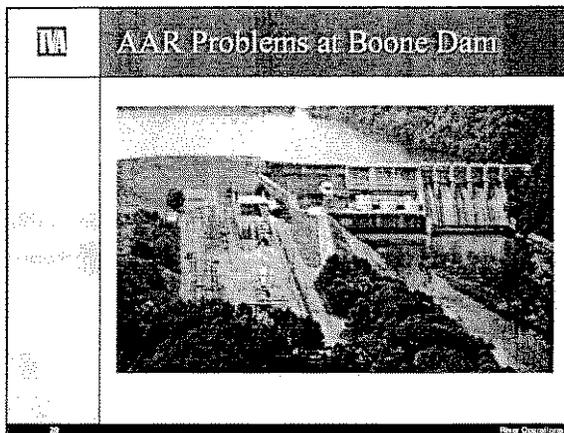
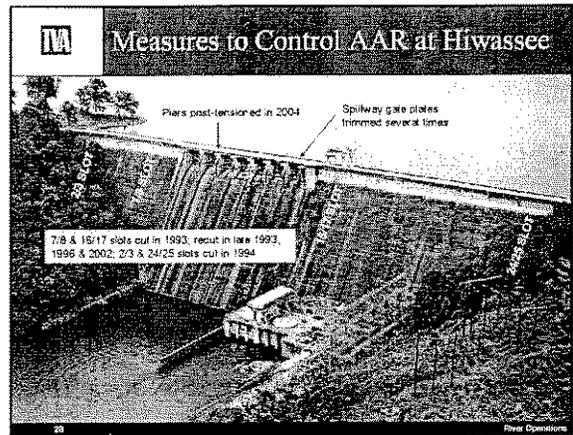
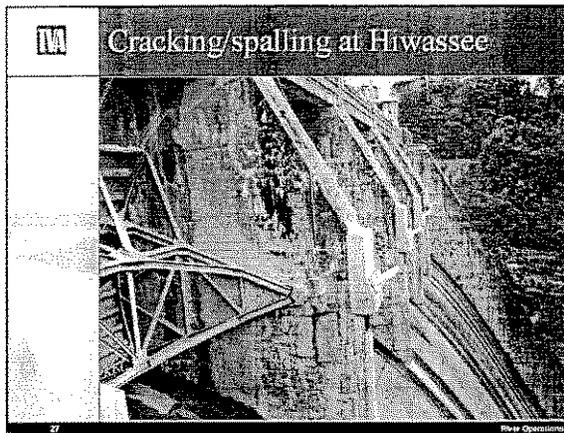
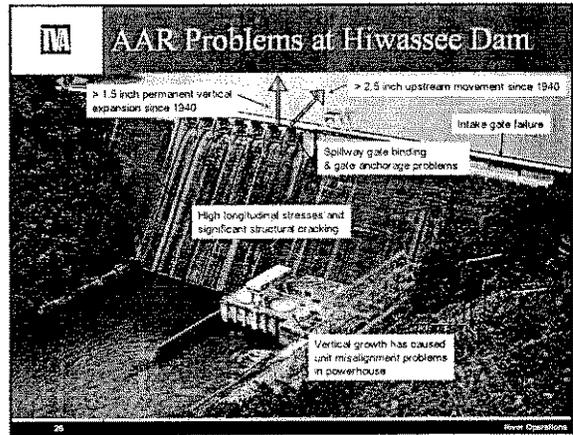
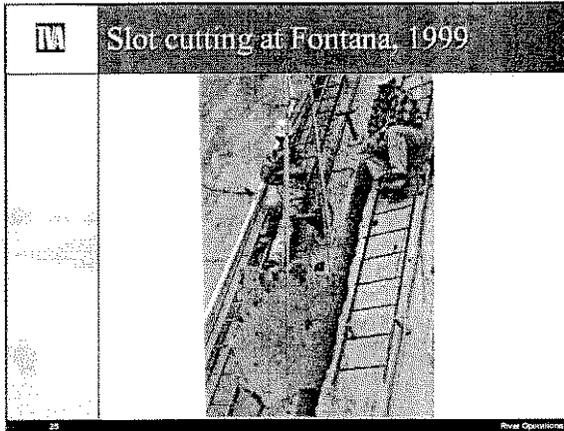
- > 3.0 inch permanent vertical expansion since 1940
- Spillway gate misalignment & binding
- > 4.0 inch permanent upstream movement in block 19 since 1940
- High longitudinal stresses, excessive movements, & significant structural cracking in curved section
- Unit misalignment problems in powerhouse

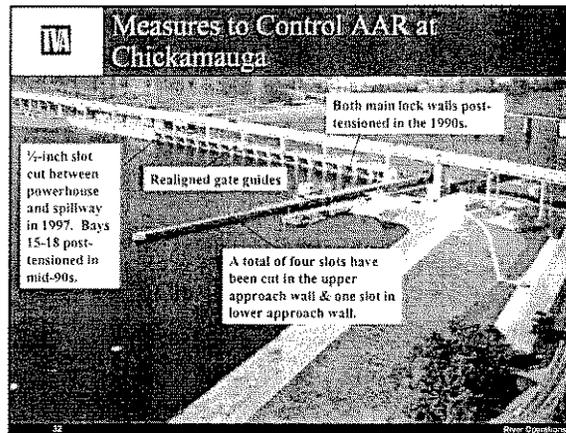
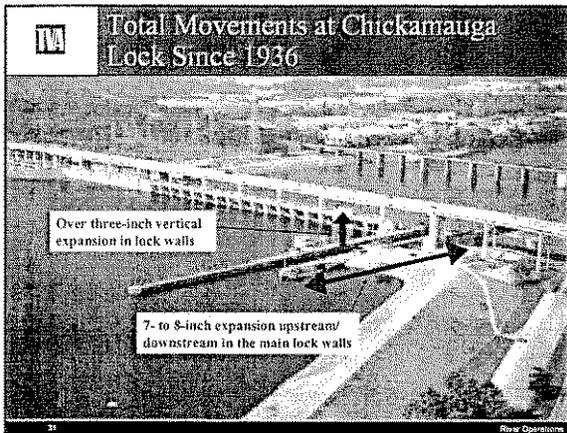
23 River Operations

**TVA** **Measures to Control AAR at Fontana**

- Upper 80 to 80 feet of dam post-tensioned in mid-1990s
- Curved section post-tensioned in mid-1970s and mid-1990s
- 32/33 wide slot cut in 1975, recut in 1984 & 1999
- Spillway slots (1/2-inch wide) cut in 1999

24 River Operations

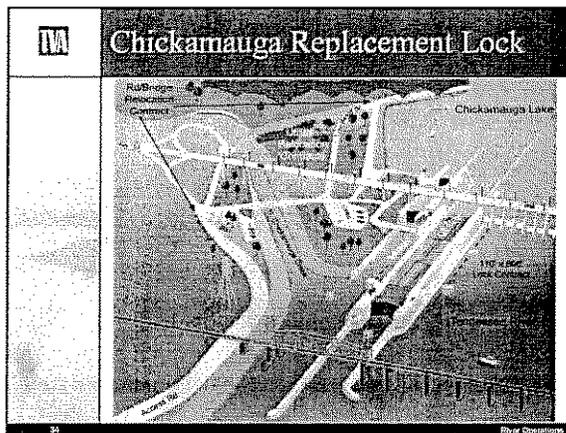




**TVA** **Summary: Concrete Growth Issues**

- Concrete growth is expected to continue indefinitely at TVA's AAR projects.
- Remedial measures such as post-tensioning and slot cutting will continue to be an effective way to manage the effects of concrete growth.
- TVA will continue to closely monitor the growth through:
  - Extensive automated instrumentation systems installed at all projects.
  - Increased inspections and other surveillance.

33 River Operations



**TVA**

## Emergency Preparedness

Wayne Poppe

**TVA**

## Emergency Situations

**TVA**

## Prepare, Practice, and Test

**TVA**

## Emergency Planning

- TVA Emergency Response Plan
- River System Operations & Environment (RSO&E) Emergency Response Plan
- River Operations (RO) Emergency Response Plan
  - Dam Safety & Engineering – Emergency Action Plans
  - River Scheduling - Notification Directory
  - Navigation & Hydraulic Engineering - Waterway Management Plan
  - Hydro Production - Site Emergency Plans, Emergency Switching

**TVA**

## Site-Specific Emergency Response Procedures

- Fire Event
- Medical Emergency
- Hazardous Material & Emergency Release
- Natural Disasters
- Bomb Threats
- Civil Disobedience
- Criminal Activity/Illegal Entry
- Suspicious Packages
- Evacuation/Shelter
- Cyber Threat
- Dam Safety Emergencies
- Flood Events
- Earthquake Events
- Navigation Events
- Loss of Hydro Dispatch Control Cell
- Emergency Switching

**TVA**

## Emergency Preparedness Facilities

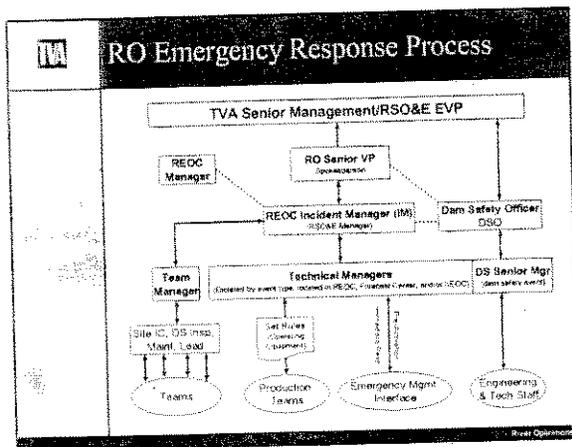
- Agency Coordination Center (Chattanooga)
- Knoxville Emergency Operations Center
  - Ft. Loudoun Emergency Operations Center
- RSO&E Emergency Operations Center (Chattanooga)
- River Scheduling Forecast Center (Knoxville)
  - River Scheduling Forecast Backup Center
- Muscle Shoals Incident Command Post

**TVA RSO&E Emergency Operations Center (REOC)**

- Emergency response staff
- Activation teams
- Communications equipment
  - Radios
  - Satellite phones
- Information & resources
  - Technical data
  - Plans, procedures, notification directories
  - Emergency Action Plans – TVA, Topoca Power Division, Nantahala Power, Progress Energy

**TVA REOC Emergency Response Levels**

- Advisory
- Alert
- Activation



**TVA National Incident Management System (NIMS)**

- Provides consistent nationwide response; consistent communication and coordination
- Adopted by TVA in March 2005
- Includes Incident Command System (ICS)
- Presently incorporating NIMS & ICS into TVA Emergency Response Plans

**TVA Emergency Preparation: Training**

- Dam Safety Awareness and Emergency Action Plan course
  - 90 classes in last five years
  - More than 1,080 participants
- Fire Training
  - Required annually for all hydro plant employees
- Incident Command Coordinator Course
- Crisis Team Management Course

**TVA RSO&E Weekly On-Call Calendar**

On-Call	Emergency Response	Monday	Tuesday	Wednesday	Thursday	Friday
REOC Manager	...	...	...	...	...	...
REOC Incident Manager (IM)	...	...	...	...	...	...
Team Manager	...	...	...	...	...	...
Technical Managers	...	...	...	...	...	...
DS Senior Mgr	...	...	...	...	...	...

	<b>Emergency Response: Drills and Exercises</b>
	<ul style="list-style-type: none"><li>• Agency emergency response exercises</li><li>• Functional exercises in cooperation with:<ul style="list-style-type: none"><li>– Federal Energy Regulatory Commission</li><li>– Tapoco Power Division of Alcoa</li><li>– U.S. Army Corps of Engineers</li><li>– Local EMAs</li><li>– Others</li></ul></li><li>• Monthly REOC Activation Team drills</li><li>• Communications drills</li><li>• Technology drills</li><li>• Emergency staff practice sessions and tabletop exercises</li></ul>

	<b>Prepare, Practice, and Test</b>
	

**KENTUCKY EMERGENCY MANAGEMENT**

Jere McCuiston  
Area 2 Manger  
Hopkinsville, Kentucky

**MISSION**

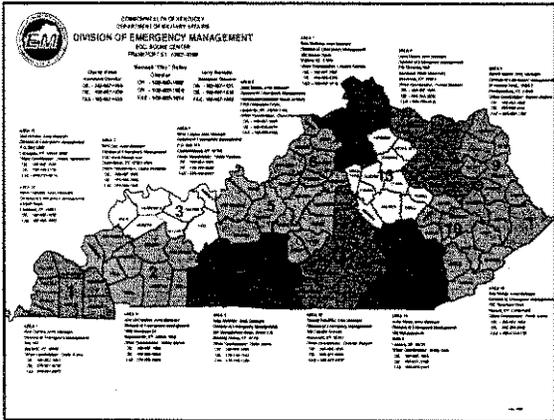
Provide a comprehensive Emergency Management System to protect life and property, public peace, health, safety and the environment of the Commonwealth of Kentucky through an **ALL HAZARDS** approach to mitigation, preparedness, **RESPONSE** and **RECOVERY** from disasters and emergencies which a local emergency response agency determines is beyond its capabilities

**ALL HAZARDS**

- Natural
- Domestic or National Security
- Transportation Related
- Infrastructure
- Hazardous materials
- Search and Rescue

**EMERGENCY MANAGEMENT**

- Operate State Emergency Operations Center and Emergency Communications Center
  - 24 Hour Warning Point for Weather, Health, Environmental, Agricultural Events
- Operate 14 Area Offices
- Coordinate Search and Rescue
- Maintain State and Validate Local Plans



**SPECIAL PROGRAMS**

- Chemical Stockpile Emergency Preparedness Program (CSEPP)
- Sensitive Materials Movement
- Emergency Management Assistance Compact (EMAC)
- Kentucky Community Crisis Response Board (KCCRB)

KENTUCKY EMERGENCY  
MANAGEMENT

Jere McCuiston  
Area 2 Manger  
Hopkinsville, Kentucky

## Emergency Manager's Checklist

### PREPAREDNESS:

- Start event log
- Assess the situation - initial impact, potential, worst case
- Alert key staff and response agencies - alert list
- Determine response capability
- Estimate outside resource needs
- Brief key staff & response agencies on procedures for:
  - Alert & notification
  - Communications - telephone, radio, conference calls etc
  - Coordination & Control - IMS packets
  - Public Information
  - Resource Request
  - Damage Assessment
  - Recovery & Record keeping - provide package of FEMA forms for equipment, workforce, materials, etc.
  - Discuss overall response plan - roles & responsibilities
- Review Emergency Operations Plan
- Request communications and warning equipment test
- Prepare public information news releases - pre-event, during event, post event / recovery
- Evacuation Orders, etc.
- Place Shelter staff on standby
- Check generators - fuel, oil, etc
- Contact hospitals ref. room availability for special needs
- Contact nursing & rest homes to ensure preparedness activities on their part
- Stock EOC with supplies - food, office supplies, sleeping quarters, maps, status boards, event log
- Contact suppliers; check quantity and procurement procedures - food, medical, fuel, rental equipment, etc Prepare State of Emergency Declaration and
- Establish lines of communications and set daily briefing times for all agencies
- Develop staff schedule for 24 hour operations
- Review responsibilities - legal, EOP, moral, etc
- Review resource list and Mutual Aid Agreements
- Contact other counties - network
- Contact Special Needs agencies - Home Health providers, Council on Aging, etc.
- Contact Utilities reps - workforce available, preparedness activities, etc
- Contact municipal reps
- Develop response and mitigation strategy
- Project resource needs

## RESPONSE:

- Establish Incident Management System
- Review or develop response strategy
- Open EOC - contact necessary staff, other agencies, etc.
- Brief staff and other officials - strategy, EOC operations, roles, record keeping, etc.
- Establish communications with field operations, shelters, Power Company, DOT, etc.
- Identify present and future resource needs
- Develop PIO media briefing schedule (e.g. 0700, 1100 and 1700)
- Scene security
- Implement record keeping of
  - Shelter status
  - Resource request
  - Weather updates
  - Operations journal
  - Property damage
  - Health hazards
  - Road blocks
  - Staff time
  - Equipment and supplies
- Develop maps including the above referenced information, etc.
- Develop time based sit reps & operations reports (e.g. 12 hr sit rep & plan for next 12 hr. operations & resource needs)
- Establish set times to conduct conference calls with response agencies to cover situation reports, lessons learned, operations for the next 12 hour shift and projected resource needs
- Request State of Emergency Declaration
- Network with other counties/ States
- Prepare recovery plan
- Evaluate message handling
- Identify hazards caused by the disaster / emergency
- Establish a staging area
- Initiate damage assessment activities - identify damaged areas, develop map
- Issue situation reports to elected officials, response agencies, EOC staff, media reps from public
- Revise SOP's and EOP
- Issue after action report
- Restock supplies - EOC, generators, and admin. supplies, etc.
- Repair equipment
- Implement recovery plan with IMS
- Designate recovery officers - IA, PA, IFG, SBA
- Identify mitigation opportunities



**Nashville District**

US Army Corps of Engineers  
Nashville District

**Partnership Corps/TVA**

US Army Corps of Engineers  
Nashville District

- TVA has owned the projects on Tennessee River system since Act of Congress, May 18, 1933.
- The Corps and TVA jointly adopted a MOA, in 1946, revised 1962.
- The Corps and TVA meet annually to review respective budgets and work schedules.

**Partnership Corps/TVA**

US Army Corps of Engineers  
Nashville District

Corps	TVA
<ul style="list-style-type: none"> <li>• Operates and maintains all locks</li> <li>• Maintains dredged navigation channels</li> <li>• Issues permits for structures in conjunction with TVA</li> <li>• Establishes harbor lines, where needed</li> <li>• Removes obstructions to navigation</li> </ul>	<ul style="list-style-type: none"> <li>• Has primary responsibility for budgeting and performing construction work of a capital account nature</li> <li>• Responsible for maintenance of secondary channels</li> </ul>

**Tennessee River Management Plan**

US Army Corps of Engineers  
Nashville District

- In 1999 TVA, TRVA, USCG, & USACE coordinated development of the Tennessee River Waterway Management Plan (TRWMP)
- Based on success of Mississippi River Crisis Action Plan

**Tennessee River Management Plan**

US Army Corps of Engineers  
Nashville District

- TRWMP Goal – facilitate safe navigation during period of less than optimal conditions
- Provides guidance for marine operations and transportation emergencies on the Tennessee River
- Timely & coordinated communications between TVA, USCG, USACE, and river industry during floods and drought conditions

**Navigation Barkley Canal**

US Army Corps of Engineers  
Nashville District

- Two river systems interconnected
  - Kentucky & Barkley Lake
  - Cuts off 66 miles of channel and avoids locking thru 2 locks
  - Elevation/flow regulated between 2 pools



U.S. Army Corps  
of Engineers -  
Heartland District

## Emergency Management

- Last major flood  
Spring 2005 -  
Flood fight,  
Smithland, KY



**TVA**

## Bear Creek Dam Environmental Impact Statement

Warren Behlau

River Operations

**TVA** **Bear Creek Project Location**

River Operations

**TVA** **Bear Creek Dam – Overview**

River Operations

**TVA** **Bear Creek Dam Construction**

River Operations

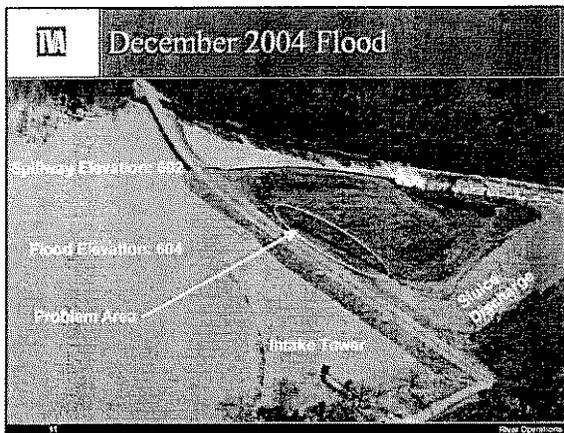
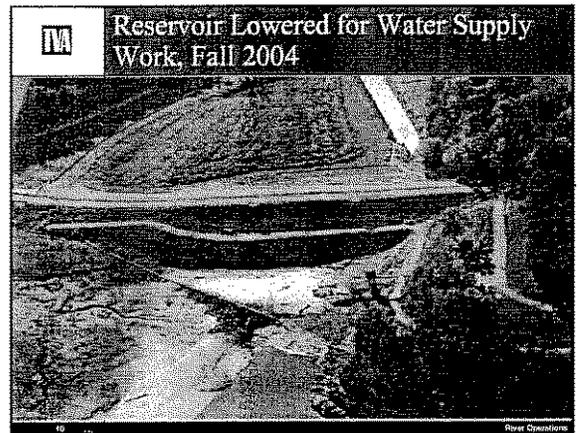
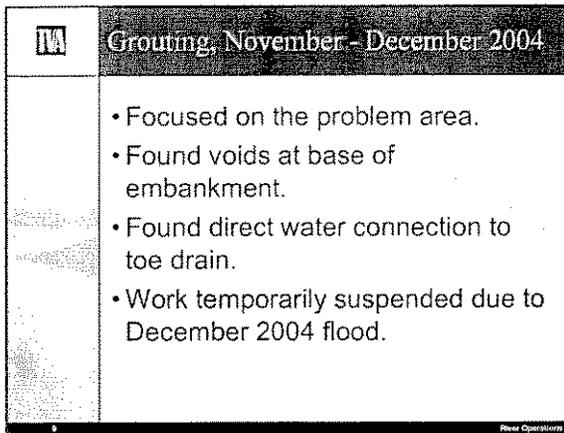
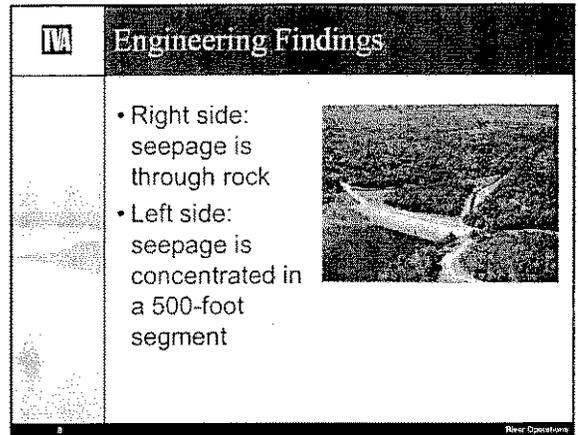
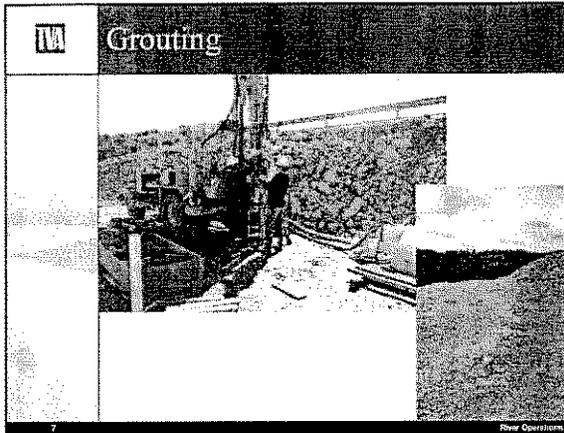
**TVA** **Bear Creek Dam Construction**

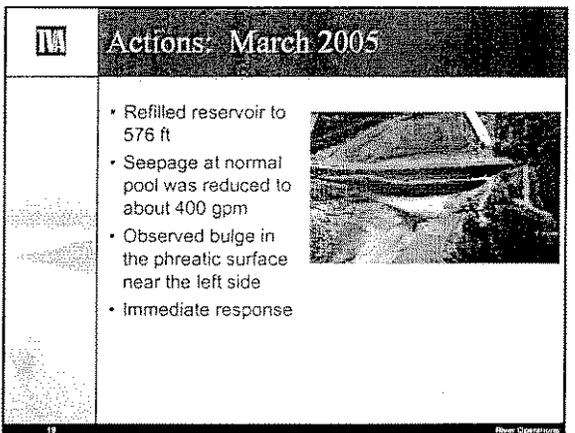
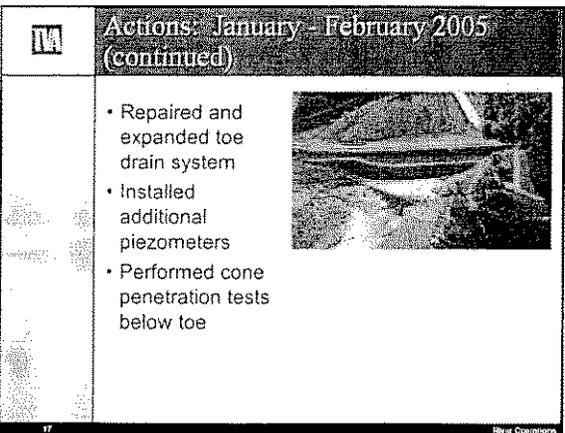
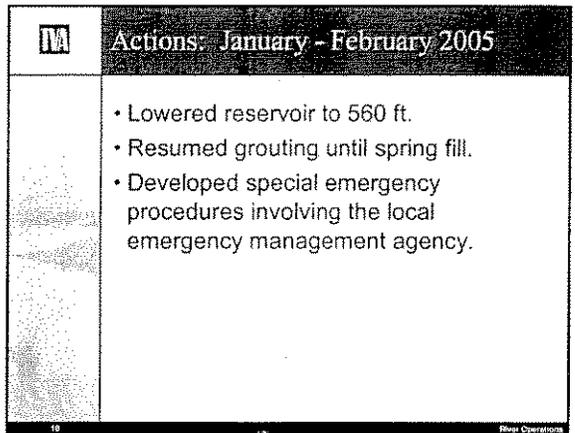
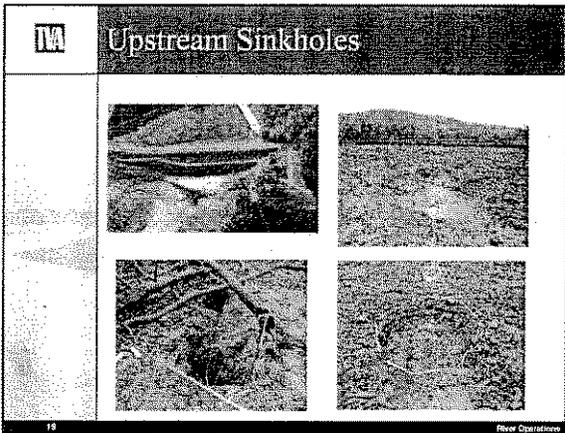
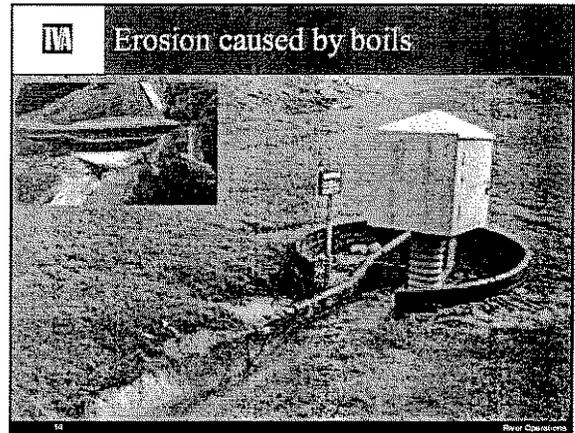
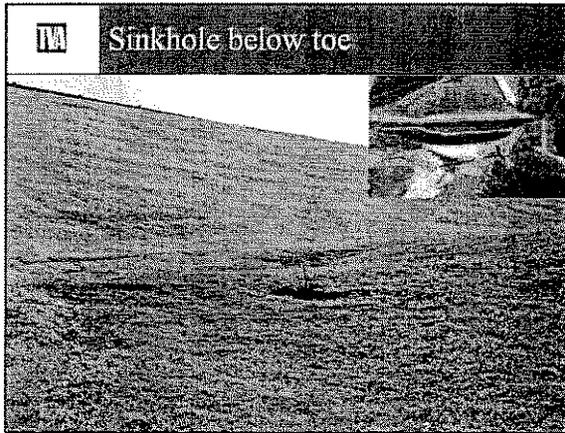
River Operations

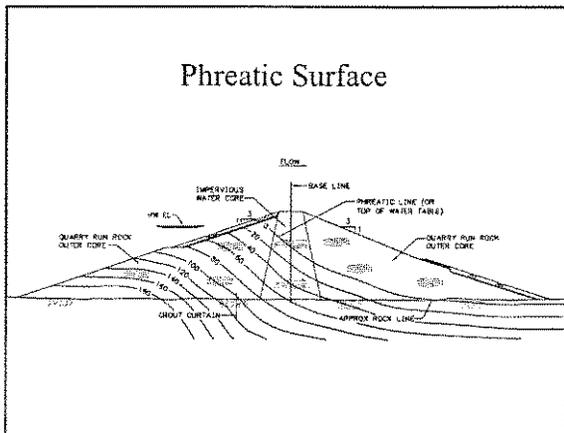
**TVA** **Historical Seepage Problem**

- 1969:
  - Discovered excessive seepage at the toe following initial filling
- 1972:
  - Remedial foundation grouting at both right and left sides
  - Reduced gage flow from 800 gallons per minute (gpm) to about 200 gpm at summer pool
- Mid 1990s:
  - Seepage had gradually increased to 800 gpm
  - Initiated detailed engineering studies

River Operations







<b>TVA</b>	<b>Actions: March 2005 (continued)</b>
	<ul style="list-style-type: none"> <li>• Changed operating elevation to 568</li> <li>• Formalized emergency procedures discussed with local emergency management agency</li> </ul>
20	<small>River Operations</small>

<b>TVA</b>	<b>2006 - NEPA Study</b>
	<ul style="list-style-type: none"> <li>• Identify public and agency issues, values, and objectives             <ul style="list-style-type: none"> <li>– Public scoping meeting planned for June 2006</li> </ul> </li> <li>• Develop a reasonable range of alternatives to evaluate</li> <li>• Perform analyses to evaluate potential impacts of alternatives</li> <li>• Document results and select a preferred alternative</li> </ul>
21	<small>River Operations</small>

<b>TVA</b>	<b>Some Known Issues</b>
	<ul style="list-style-type: none"> <li>• Downstream public safety</li> <li>• Agricultural</li> <li>• Flood damage reduction</li> <li>• Environmental</li> <li>• Water supply</li> <li>• Cultural</li> <li>• No residential development</li> <li>• Economic</li> <li>• Recreation</li> </ul>
22	<small>River Operations</small>

<b>TVA</b>	<b>Preliminary Options</b>
	<ul style="list-style-type: none"> <li>• No action: Operate dam as designed or modify pool elevation.</li> <li>• Lower spillway: Determine if low elevation weir is possible.</li> <li>• Repair: Restore the water barrier under the embankment using grouting, cutoff wall, or other solution.</li> <li>• Breach: Remove portion of dam and restore original stream channel.</li> </ul>
23	<small>River Operations</small>

<b>TVA</b>	<b>Recap</b>
	<ul style="list-style-type: none"> <li>• Significant problems with sinkholes and seepage</li> <li>• Continued permanent damage to foundation may occur during future flood events</li> <li>• Hydro Board of Consultants recommends action</li> <li>• Maintaining reservoir elevation at 568 feet</li> <li>• Closely monitoring the situation; materials and equipment on hand should problems develop.</li> <li>• NEPA study underway</li> </ul>
24	<small>River Operations</small>

## TVA Non-Power Infrastructure

Non-power infrastructure is the subset of TVA assets not directly involved in the generation and transmission of electricity. It includes the non-power portion of multi-purpose projects and other non-power structures and facilities required to meet the requirements of the original TVA Act and other Congressionally mandated projects.

### *Non-power natural resource assets include:*

- 11,000 miles of shoreline
- 800 miles of navigable waterway
- 629,000 acres of reservoir at normal maximum pool level
- 13,400,000 acre-feet of useful controlled water storage
- 293,000 acres of reservoir land above pool and 470,000 acres of land under water

### *Non-power structures and facilities include:*

#### *Navigation*

- Locks: 14 locks from 60 ft x 292 ft to 110 ft x 1000 ft and from 39 to 80 years old
- Lock Support Facilities: 10 operations buildings and workshops
- Mooring Cells: 51
- Navigation Aids:
  - Secondary Channels - 372 miles of marked channel, 1,600 buoys (red, green, hazard, overhead power line), 310 additional aids (day boards, danger pipes, upper limit markers, danger signs)
  - Tributary Reservoirs - 292 dayboards and 233 boat hazard buoys

#### *Flood Control*

- Dams: 49 dams (29 multi-purpose hydro-power dams and 20 non-power dams)
- Embankments: 34
- Saddle Dams and Dikes: 33
- Spillways & Gates: 442
- Sluices & Associated Valves and Gates: 67
- Backwater Protection and Dewatering Stations: 10

#### *Recreation*

- Campgrounds: 11 campgrounds and 589 campsites
- Day Use Areas: 51 reservoir boat launching ramps, 68 stream access sites, 36 picnic areas, 30 hiking trails, 15 fishing berms, 9 swimming beaches
- Boating Access Sites: 68 access sites

#### *Other*

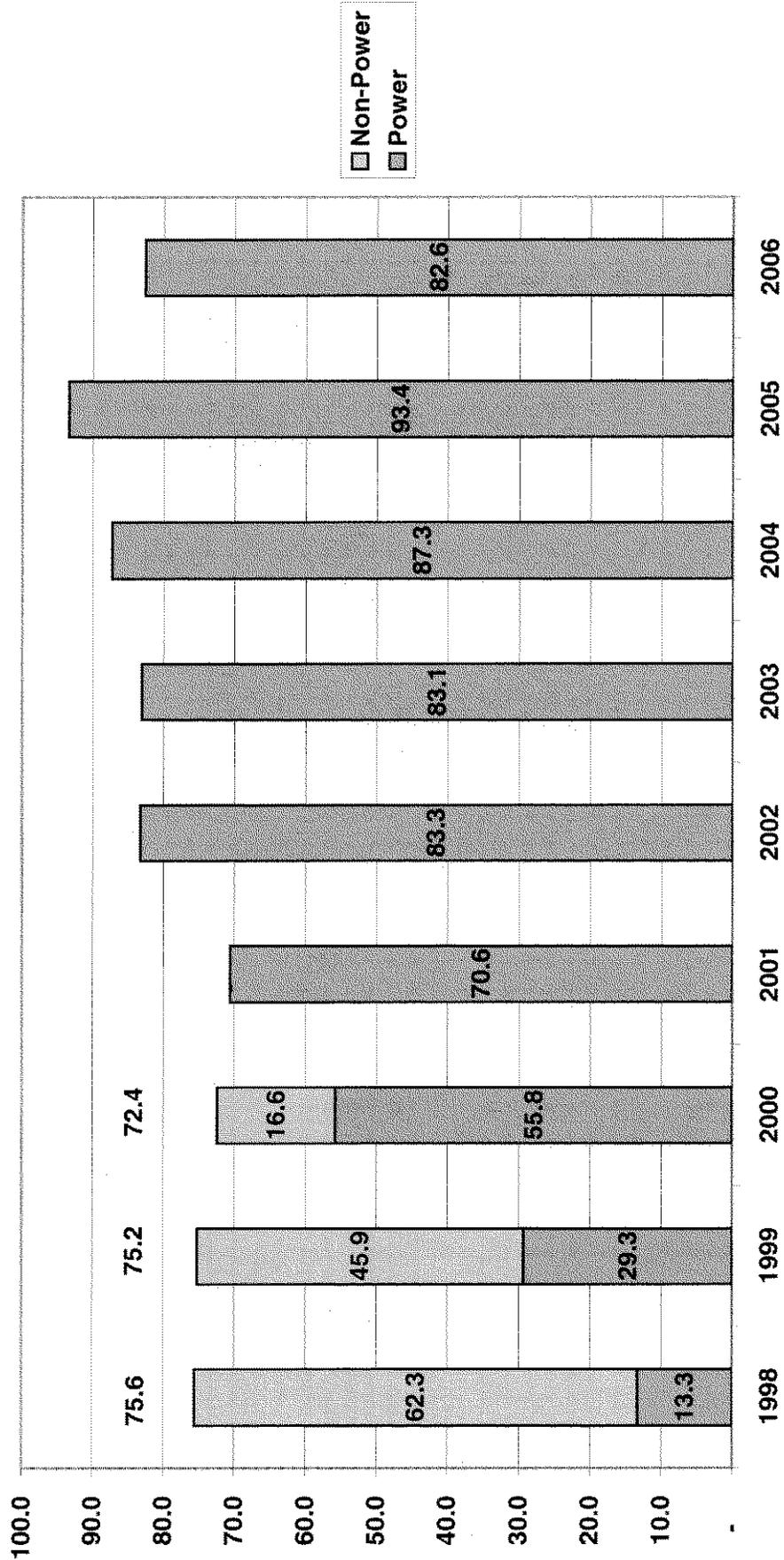
- Bridges: 92

## TVA WATER AND LAND STEWARDSHIP FUNDING 1998 - 2006

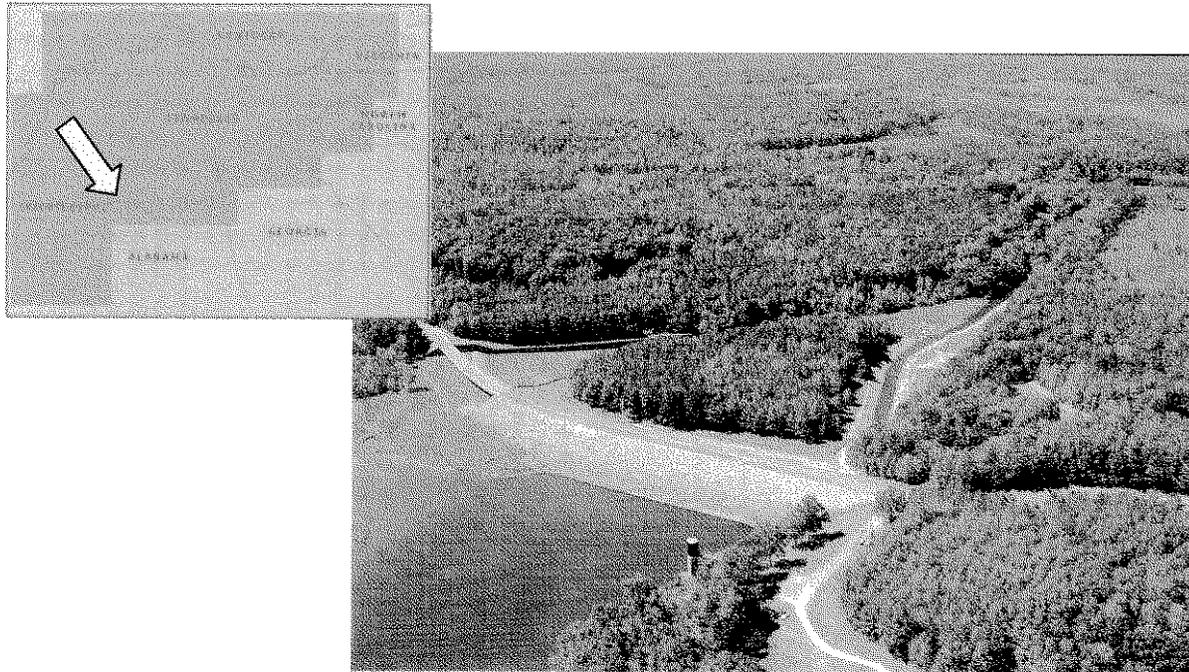
	1998	1999	2000	2001	2002	2003	2004	2005	2006
	Actuals	Budget							
<u>WATER AND LAND STEWARDSHIP PROGRAMS</u>									
NAVIGATION CAPITAL	2.3	(6.3)	0.8	0.1	0.8	0.2	1.4	1.3	0.7
RESERVOIR RELEASE IMPROVEMENTS CAPITAL	0.1	0.1	-	0.1	-	-	5.3	12.7	-
RIVER BASIN LAND CAPITAL	0.2	0.8	0.5	0.7	0.9	0.8	0.2	0.2	0.8
DAM SAFETY CAPITAL IMPROVEMENTS	2.9	1.1	3.8	2.1	3.9	2.5	2.4	3.9	0.5
TOTAL CAPITAL	5.4	(4.3)	5.1	3.0	5.6	3.4	9.3	18.0	1.9
DAILY RESERVOIR OPERATIONS/EMERGENCY PREPAREDNESS	8.3	7.4	8.5	8.6	8.3	9.3	9.9	10.2	11.1
DAM SAFETY OPERATIONS & MAINTENANCE	21.3	20.6	17.3	16.8	25.7	25.9	24.7	21.6	22.8
NAVIGATION, OPERATIONS & MAINTENANCE	6.4	12.3	4.1	3.1	3.0	2.5	2.8	2.7	2.7
RESERVOIR REL IMPROVMTS AND RIVER ACTION TEAMS	9.1	9.5	13.3	14.4	12.4	11.4	13.2	12.8	13.2
REGIONAL WATER SUPPLY	0.5	4.1	1.4	0.6	0.6	0.5	0.6	0.6	0.6
MOSQUITO/PLANT MANAGEMENT	1.8	2.4	2.1	2.0	2.0	1.7	1.7	1.8	1.9
RESERVOIR SHORELINE STABILIZATION/SHORELINE MANAGEMENT	5.1	5.4	5.6	5.7	5.2	5.3	5.8	6.7	5.2
RIVER BASIN LAND O&M/LAND USE&STRATEGY/HAZARDS WASTE	16.3	16.4	13.5	15.3	13.4	13.6	16.7	17.8	21.6
REGIONAL NATURAL HERITAGE/CULTURAL RESOURCES	1.3	1.4	1.4	1.1	1.5	1.6	1.1	1.2	1.5
RESERVOIR OPERATIONS STUDY	-	-	-	-	5.7	8.0	-	-	-
TOTAL O&M	70.2	79.5	67.3	67.6	77.7	79.6	78.0	75.4	80.7
TOTAL CAPITAL AND O&M	75.6	75.2	72.4	70.6	83.3	83.1	87.3	93.4	82.6
Power	13.3	29.3	55.8	70.6	83.3	83.1	87.3	93.4	82.6
Non-Power	62.3	45.9	16.6	-	-	-	-	-	-

# WATER AND LAND STEWARDSHIP POWER & NON-POWER

In Millions of Dollars



# Bear Creek Dam



- Creates Bear Creek Reservoir – 560 acres, one of four reservoirs which comprise the Bear Creek project located in northwest Alabama
- Built in 1969 for \$9 Million
- Earthen dam standing 68' high and 1385' long
- Primary uses – flood control, recreation, economic development, and water supply
- Seepage issue since original construction
- Several fixes tried, but have not eliminated the problem
- Seepage must be addressed to prevent the gradual erosion of the dam's foundation and the increased risk of dam failure
- To ensure the dam's continued safe operation, TVA is initiating a study to evaluate long term solutions to the seepage issue

**Victor P. Dura**

P.O. Box 509  
Rogersville, AL 35652  
256-247-1431 vpdura@Hiwaay.net

May 4, 2006

Regional Resource Stewardship Council  
TVA  
400 West Summit Hill Dr., WT 11A,  
Knoxville, TN 37902-1499  
Via fax to 865-632-3146

Dear Stewardship Council:

Subj.: Comments for May 10 meeting

Thank you for the opportunity to submit comments to the Council. I, and several members of the community near the mouth of the Elk River (mile 1.5) have recently had reason to review the Wheeler Reservoir Land Management Plan (released Dec. 1995). We were dismayed to find how inappropriate and outdated (in our opinion) the Plan Land Use designations are given the phenomenal growth pressures the area has experienced in the past five or six years. The area now is nothing like that described at the time the Plan was developed (probably in 1994 or early 1995). The area is now much more intensively developed than at the time the data in the plan was collected.

We understand the Land Management Plans are generally on a ten-year review cycle, but that period is not a "hard" requirement. Indeed, that period has already passed for the Wheeler Reservoir plan. Accordingly, I would like to request that the Wheeler plan be scheduled for update as soon as practicable. We believe that a priority should be established for the plan update, particularly since the March 17 2005 meeting of the Regional Resource Stewardship Council Meeting identified "development pressures" as one of the underlying factors supporting the need for a plan's revision.

Sincerely,

*Victor P. Dura*

Shoals Environmental Alliance  
Rogersville SIG

---

**From:** Hill, Sandra L. (Knox)  
**Sent:** Tuesday, May 09, 2006 10:59 AM  
**To:** 'Barnett, J (Home)'  
**Subject:** FW: ATTN: Jimmy L. Barnett

This forwards an e-mail addressed to you through the Regional Council web site. This e-mail was sent individually to each member of the Regional Council and will be forwarded to each.

-----Original Message-----

From: rockinrob35652@yahoo.com [mailto:rockinrob35652@yahoo.com]  
Sent: Saturday, May 06, 2006 2:16 AM  
To: Hill, Sandra L. (Knox)  
Subject: ATTN: Jimmy L. Barnett

On Saturday, May 6, 2006 at 02:15:35, the following data was submitted from  
[http://www.tva.com/rrsc/bios/rrsc\\_jimmylbarnett.htm](http://www.tva.com/rrsc/bios/rrsc_jimmylbarnett.htm)

Name: Robin Burchfield  
e-mail Address: rockinrob35652@yahoo.com  
Message:  
Robin Burchfield  
1194 Barnett Rd.  
Rogersville, Al 35652  
256-247-1549  
rockinrob35652@yahoo.com

May 5, 2006

Regional Resource Stewardship council  
400 W. Summit Hill Dr., WT 11 A  
Knoxville, Tn. 37902

Subject: Comments for May 10 Meeting

Dear RRSC Members,

I would like to voice my concerns and request TVA take another look at their natural resources and environmental impacts on all reservoirs. It is time for new and updated Land Management Plans especially on Wheeler Reservoir. The present one is outdated due to all the growth in the area since 1995. Any decisions made based on the Plan are not in the best interest of the people or the environment. TVA appears to be in the real estate business and not into the Environmental Stewardship. They are leasing or selling my land (public) and land they took from others to private individuals for personal profit. It has got to stop!

I am not against the development of new recreation areas in the valley. I was born and raised in Oak Ridge, Tn. and grew up on TVA reservoirs. I currently live on the Elk River in Rogersville, Al. Bubba Doss has put in a request to TVA for a recreational development on 91 acres on Tract 21 to build a marina and campground. According to the 1995 Land Management Plan this lot was allocated for Commercial Recreation and Visual Management but not one of the best spots because of highly erodible soils. TVA has designated wetlands in this area and the public has identified Ginseng growing here, Mussel beds in area to be dredged, Eagles and Osprey feeding in this area, spawning areas for fish but TVA's FEA says "there will be No Significant Impacts to this site." The Public used to ride horses and ATVs in this area but TVA put up chains to keep them out due to the erosion they were causing and now they will let someone come in and bulldoze approx. 60 of the 91 acres with no impact!

. I'm sorry but I beg to differ.

This area on Elk River is already over-developed. Across from the proposed Marina there

**REGIONAL RESOURCE STEWARDSHIP COUNCIL**

**QUESTIONS RELATED TO TVA's INFRASTRUCTURE STEWARDSHIP**

**AND EMERGENCY PREPAREDNESS AND COORDINATION EFFORTS**

TVA has mission-based responsibilities for stewardship of water and land-based resources and infrastructure throughout the Tennessee Valley. TVA conducts programs to maintain this infrastructure and to coordinate with appropriate local, state, and federal agencies in the event of emergencies.

At the May 2006 Regional Resource Stewardship Council meeting, TVA will provide information on these programs and ask the Council to respond to the following questions:

**1. How do you perceive the adequacy of TVA's infrastructure stewardship activities?**

**Strengths**

- TVA can't do more than its doing now.
- Given the vastness of the facilities, TVA does a good job with the infrastructure it has. The integrity of the infrastructure is good.
- Passion for infrastructure stewardship activities by the TVA staff is commendable.
- Commend TVA on the thoroughness of its preventive maintenance program.

**Weaknesses**

- Given the financial constraints, there is too much to be done for TVA to accomplish all that needs to be done in all its infrastructure.
- Reports by the Hydro Review Board are not available to the public.

**2. Do you have any suggestions for improvement in TVA's infrastructure stewardship activities?**

- Respect the confidence and expertise of TVA staff; however, an outside audit is necessary.
- Need periodic third-party audit of infrastructure, perhaps by the Department of Homeland Security or other qualified group, in addition to the TVA peer review process. A report should be made available to the public.
- Council is not qualified to make judgments regarding TVA's infrastructure stewardship activities. Third-party, independent audit is good idea for independent validation of TVA's infrastructure stewardship activities/emergency preparedness activities.
- Perhaps the USACE and TVA could evaluate and validate each other's infrastructure stewardship activities.
- Re-emphasis on public education on water intakes, outflows, and for those who manage the facilities.
- Make sure TVA is informed of current, credible threats known by the federal government, possibly through participation in NIMS.
- Conduct real-world exercises, in addition to tabletop exercises, on a periodic basis to truly test response capabilities.
- Be cautious about placing additional burdens on TVA to fix problems across the system.

**3. How do you perceive the adequacy of TVA's emergency preparedness and coordination efforts with the U.S. Army Corps of Engineers and state and local agencies?**

**Strengths**

- Commend TVA for their efforts in the myriad of details involved in emergency preparedness, training, and exercises.
- Commend TVA on its willingness to work with the USACE, state and local agencies, and the reciprocity of cooperation with those agencies.

**Weaknesses**

**4. Do you have any suggestions for improvement in TVA's emergency preparedness and coordination efforts?**

- Encourage partnerships with agencies to get information and training to local EMA's and local governments.
- The efforts seem fragmented, different teams deal with different pieces of infrastructure (dams, transmission, bridges). Need to ensure that there is an overarching committee to oversee those activities and ensure completeness of the process.
- Need an agency-wide group to provide guidance to the other groups on specific issues.

**5. Has TVA considered a full range of options for Bear Creek Dam?**

- Find David Nye, form interagency teams, similar to ROS. Need good management of the process.
- Need to evaluate the priorities of facilities, studies to be undertaken, and determine what is essential to TVA's core mission.
- Public scoping should involve information on the cost of all options. If the public and local governments are aware of the long-term costs to them, perhaps those funds could be re-directed to fix the seepage problems.
- No more cost burdens should be placed on local governments.
- Too premature in the process to say that local governments should not share in the cost burden.
- Consider that the ratepayers have already paid for remedial activities to try and preserve the dam as is. Ratepayer money that has been spent should be considered as their contribution and not make them contribute any more money. Opposed to any other power funds being spent on this project.
- The total ratepayer cost should not be more than the cost estimated for a breach of the dam (\$4-5M).
- Form a stakeholder forum, similar to the group formed for Gunterville aquatic plants issues.

- Council is divided as to how the cost should be allocated for the preferred alternative.
- NEPA process needs to work through the cost-benefits and address those issues in a public forum.
- Determine if this is a federal, state or local issue, and the secondary impacts/costs to TVA.
- The council recommends that Federal Appropriations be used to help pay the cost.
- Need to apply whatever decisions are made in this study across the basin to other non-power dams.
- Based on analysis of Bear Creek, provide benchmark to be used on other non-power dams, including karst/sinkhole issues.
- Safety issues should be dealt with first to protect lives and property.

**6. What other options should be considered?**