

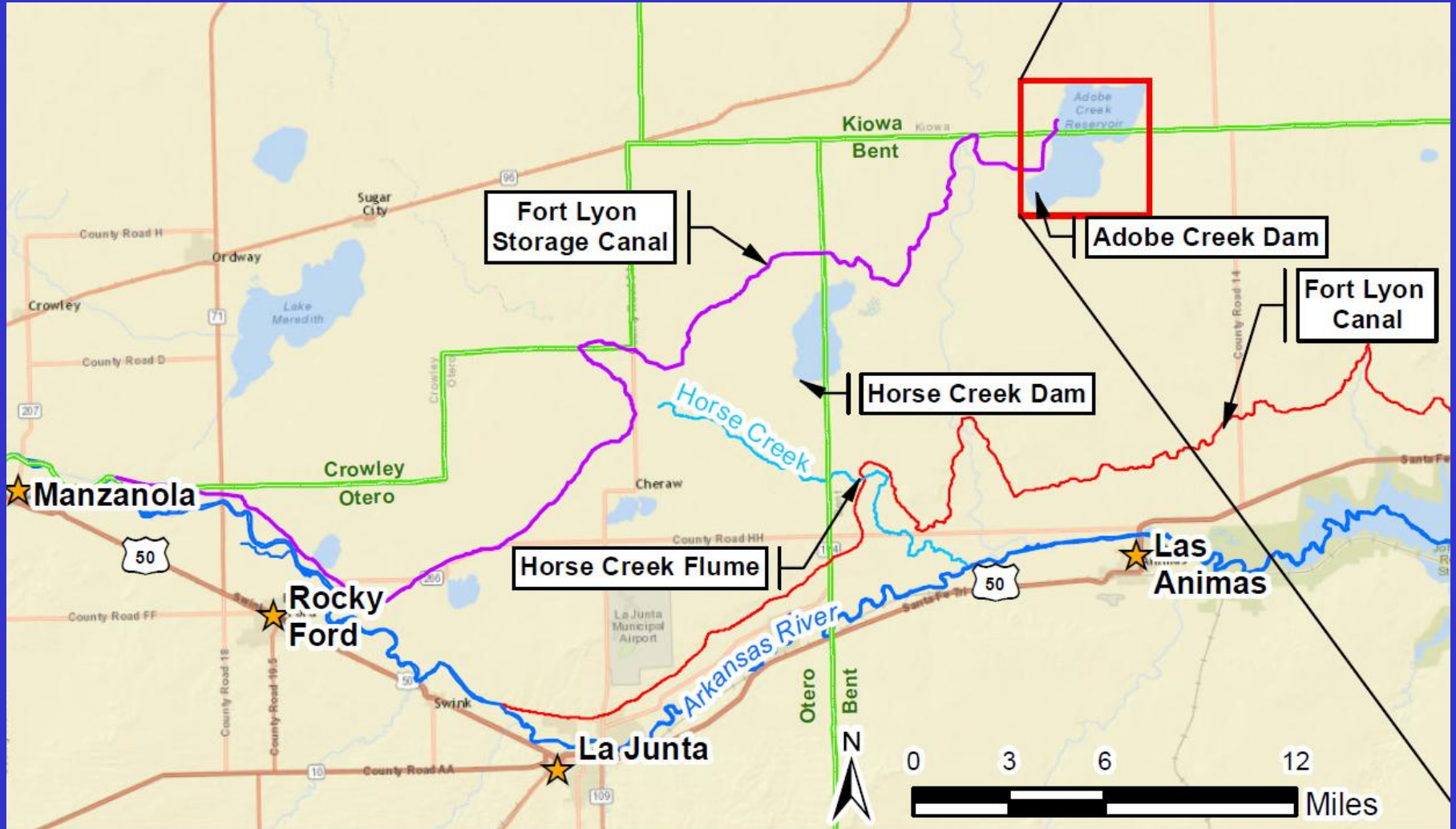
Adobe Creek Dam Seepage Evaluations

Arkansas Basin Roundtable Presentation

July 13, 2016



Project Location



Colorado Dam Safety Branch Concerns

- 2016 Dam Safety Inspection Report
 - Conditional Satisfactory Rating
 - Action is required to avoid future storage restrictions
 - 112-year-old VCP outlet pipe is considered marginally acceptable
 - Strong recommendation for FLCC to begin an outlet works rehabilitation project immediately
 - Seepage issues in the dam have not been addressed and these issues remain a risk to the dam

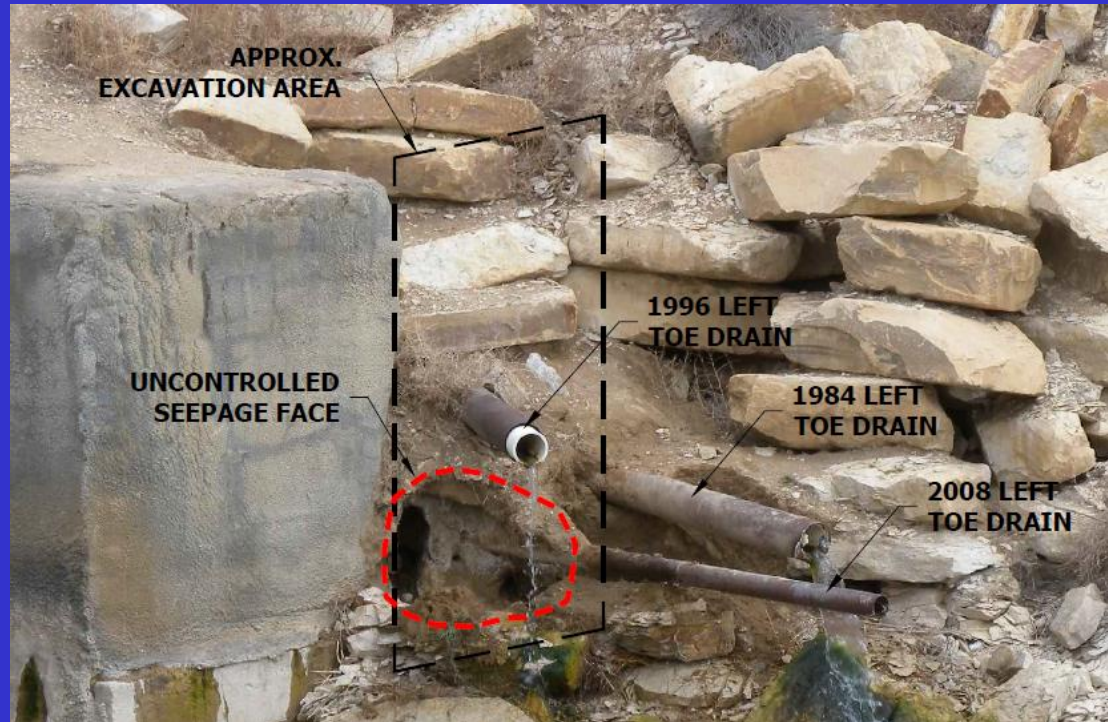
March 2016 Incident

- Uncontrolled seepage observed along outlet conduit
 - Emergency Action Plan was initiated
 - Temporary toe drain repair was constructed



Previous Maintenance Projects

- Previous toe drain attempts:
 - 1984 toe drain
 - 1996 toe drain
 - 2008 toe drain
 - 2016 toe drain



- Previous outlet conduit sealing projects
 - 1984: sealed 50 leaking joints
 - 2011: sealed 27 leaking joints

Piping Failures in Dams

- For piping to occur four conditions must exist: (Von Thun, 1996)
 1. There must be a flow path/source of water.
 2. There must be an unprotected exit (open, unfiltered) from which material can escape.
 3. There must be erodible material within the flow path that can be carried to the exit.
 4. The material being piped or the material directly above it must be able to form and support a “roof” or “pipe”.

Consequences of Dam Failure

- **Potential loss of life**
- **Loss of 71,000 AF of agricultural water storage**
 - Disastrous effects to 500 to 1,000 people in Bent, Otero and Prowers Counties
 - 93,000 acres of farmland affected
 - Up to \$50 million in lost crop revenue
- **Loss of nonconsumptive use**
 - Endangered species habitat
 - CPW: stored water is imperative for wildlife & wildlife-related recreation at Adobe Creek SWA
- **Loss of important storage for Arkansas basin compact maintenance**

CPW Letter of Support



COLORADO Parks and Wildlife

Department of Natural Resources

SE Region Office
4255 Sinton Rd.
Colorado Springs, CO 80907
P 719.227.5200 | F 719.227.5297

June 30, 2016

Arkansas Basin Roundtable Members
C/O Chairman Sandy White
PO Box 1834
Colorado Springs, CO 80901

Dear Mr. White,

I am writing in support of the Adobe Creek Dam Seepage Evaluation Water Supply Reserve Account Application submitted to the Arkansas Basin Round Table by the Fort Lyon Canal Company. Engineering evaluations to determine the extent of dam rehabilitation necessary for the reservoir to safely store water have been identified as a critical need pursuant to a March 2016 inspection by the Division of Water Resources Division 2 Dam Safety Engineer. The ability of the dam to store water is imperative for wildlife and wildlife-related recreation at Adobe Creek Reservoir State Wildlife Area.

Adobe Creek Reservoir is an identified nesting habitat site for the federally endangered least tern and the federally threatened piping plover. In addition, the reservoir is a very high quality crappie, saugeye and catfish fishery, which also supports populations of wiper, green sunfish, bass and other species. The reservoir provides an important layover locale for migrating birds as well as waterfowl hunting for ducks and geese. Also, the reservoir provides abundant wildlife watching opportunities and significant water-based recreation.

CPW supports the work proposed in this application, as it assists in maintaining Adobe Creek Reservoir, thereby providing important wildlife habitat and a high quality publicly-accessible recreation site.

Sincerely,

A handwritten signature in black ink that reads 'Brett A. Ackerman'.

Brett Ackerman
SE Region Deputy Regional Manager
Colorado Parks and Wildlife



Scope of Work

- **Subsurface investigations, including installation of additional piezometers,**
- **A thorough outlet conduit inspection,**
- **Seepage analyses,**
- **Development of dam and outlet conduit rehabilitation or replacement alternatives, as appropriate,**
- **Cost opinions for the alternatives,**
- **Preparation of a feasibility report to outline alternatives for future repairs**

Grant Funding Mix

	Budget
Fort Lyon Canal Company Match	\$10,000
Arkansas Basin Grant Funds	\$5,000
State WSRA Grant Funds	\$45,000
TOTAL	\$60,000