



MEMORANDUM

April 7, 2011

TO: BOARD OF DIRECTORS
ERIC KUHN, GENERAL MANAGER
DAN BIRCH, DEPUTY GENERAL MANAGER

FROM: JOHN CURRIER, P.E., DON MEYER, P.E.

SUBJECT: WOLFORD MOUNTAIN RESERVOIR

We want to provide you with a status report of the ongoing Ritschard dam investigations and a summary of projected 2011 reservoir operations. **No Board action is requested.**

1. Reminder of Action Taken at January, 2011 Board Meeting

Staff recommended entering into a new continuing services agreement (CSA) with URS with authorization for funding to cover 2011 and 2012 investigations and evaluation of remediation alternatives. The existing CSA was scheduled to expire on January 31 and it had been amended 6 times and well beyond the initial scope and intent.

The Board directed that the existing CSA be extended until the end of July, 2011 rather than approving a new CSA. The expert peer review of settlement and the URS' investigations to date would occur within the extension period. Unallocated funding in the existing CSA (~\$130,000) was deemed sufficient to cover outstanding URS tasks and any expenditures during the peer review process.

2. Peer Review Status

Three peer reviewers, each with extensive and internationally recognized experience have been retained. Staff is very pleased with the experience these gentlemen bring to bear.

A peer review site visit and workshop with URS will take place on April 28 and 29 at Wolford Mountain Reservoir. A 2nd workshop will be held with URS on June 2. The outcome will be an Accountability Report and Work Plan prepared by URS that addresses the recommendations of the peer reviewers. The peer reviewers will also prepare a summary report of their investigation.

Both URS and a representative of the peer review committee will make presentations to the Board at the July meeting.

3. Colorado School of Mines Research Investigation

A CSM PhD candidate, Ben Lowry, will be conducting investigations at Ritschard Dam using and evaluating sophisticated remote sensing techniques to monitor and measure the embankment deformation. This will form the basis of his PhD dissertation. Field investigation will commence in late April in conjunction with the 1st peer review workshop. The work is funded under an NSF grant at no cost to the River District.

The results will be available for use by the River District in our on-going evaluations. We are excited and pleased to have this opportunity as it represents a win-win opportunity; the River District will obtain additional, beneficial information at essentially no cost, and the monitoring state of the art will be improved.

If you are interested, additional information on the CSM program can be found at smartgeo.mines.edu.

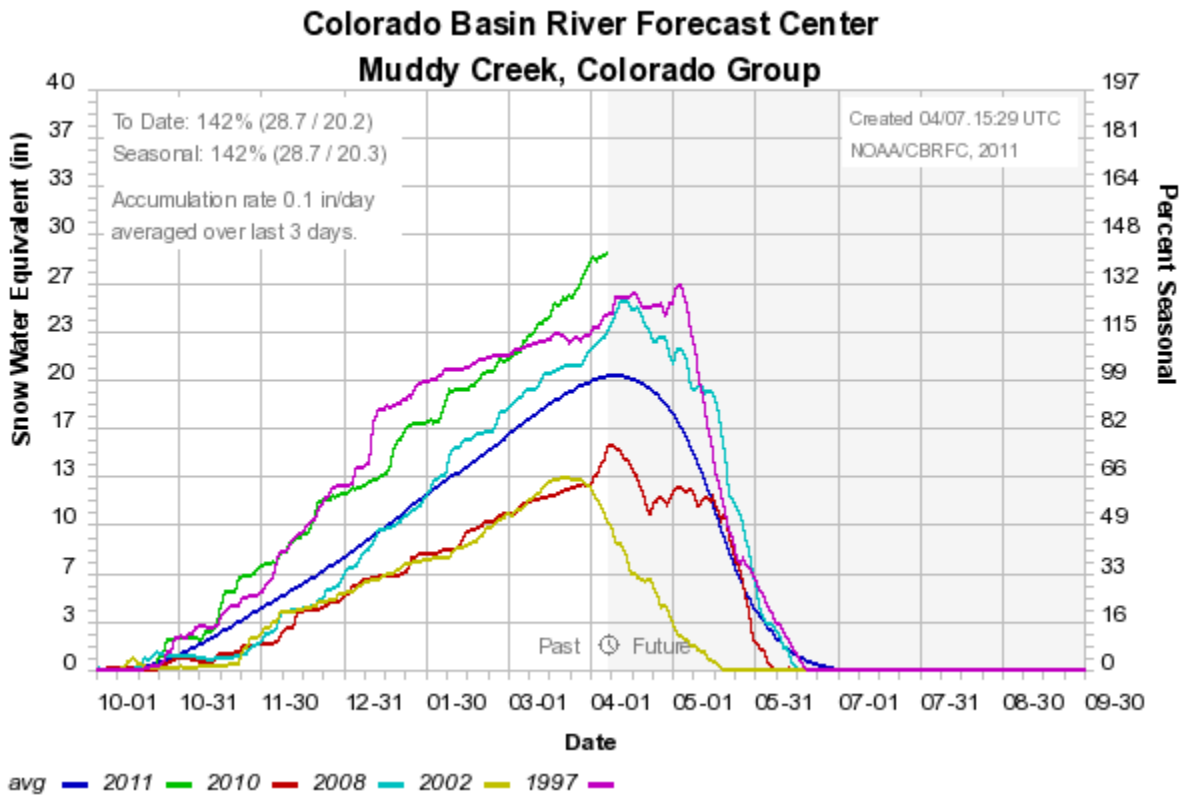
4. URS Investigations Finalized Since January, 2011

In January two outstanding URS' tasks were incomplete. Both have been completed.

1. **Inflow Design Flood Analysis.** Due to the unusual settlement, the inflow design flood (IDF) of record (from 1995) cannot be routed through the reservoir without overtopping the dam. URS has finalized a study titled *Inflow Flood Hydrology for Ritschard Dam, March 2011.* Based on current State Engineer rules, the investigation concludes that the IDF can be passed through the reservoir with 1.5 feet of freeboard based on the existing amount of settlement (the State Engineer requires that the IDF be passed with 1 foot of freeboard). By the April meeting, staff will have submitted the report to the State requesting that it be adopted as the Flood Hydrology Report of record.
2. **Outlet Tower Bridge Analysis.** Embankment deformation has affected the bridge leading from the dam crest to the outlet tower. URS evaluated movement of the bridge deck and piers. The report finds "*that the existing bridge appears to be stable and of adequate strength for the intended service in the near term...*" Along with embankment monitoring, staff continues to monitor the bridge.

5. Reservoir Operations

Snowpack above Wolford is the highest on record. The graph below shows the Rabbit Ears snotel site snow water equivalent for April 7 for 2011, 2010, 2008, 2002, and 1997. The current snowpack above Wolford exceeds that of 1997, in which the total inflow to Wolford was 108,000 af or 180 % of average.



Shoshone Operations. Shoshone is currently operating with both turbines online at capacity. Xcel plans to evaluate additional core borings of the abutments of the dam. Depending on that evaluation, the dam may be judged to be safe with no additional work required. If additional grouting is required, it will be done prior to high flows if deemed urgent, or it could wait until this fall if the potential problem is not so urgent.

We anticipate that a temporary Shoshone outage protocol will operate this summer and fall as it did last year. We anticipate that major reservoir operators (Dillon, Williams Fork, Green Mountain, and Wolford) will agree to operate as if the Shoshone 1250 cfs call were in place at times when the plant is out of operation and cannot place a call.