

MEMORANDUM
JULY 6, 2017

TO: BOARD OF DIRECTORS
ERIC KUHN, GENERAL MANAGER
PETER FLEMING, ESQ. GENERAL COUNSEL

FROM: RAY TENNEY, P.E., DON MEYER, P.E.

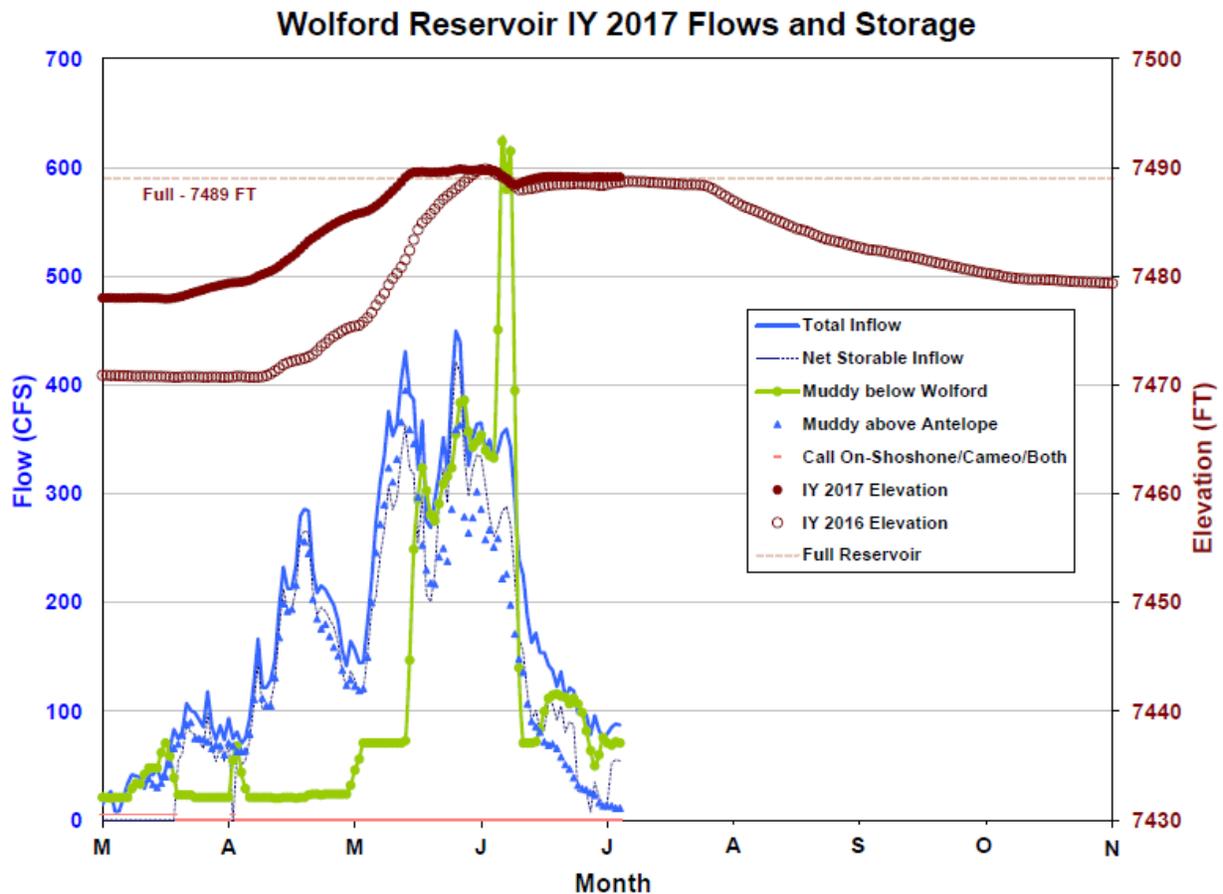
SUBJECT: WOLFORD MOUNTAIN RESERVOIR AND ELKHEAD RESERVOIR OPERATIONS

This memo summarizes 2017 Wolford and Elkhead Reservoir operations and maintenance activities.

Board action is requested on a two year extension of the Wolford recreation area concession agreement CA 15032 with Red Mountain RV Park as described below.

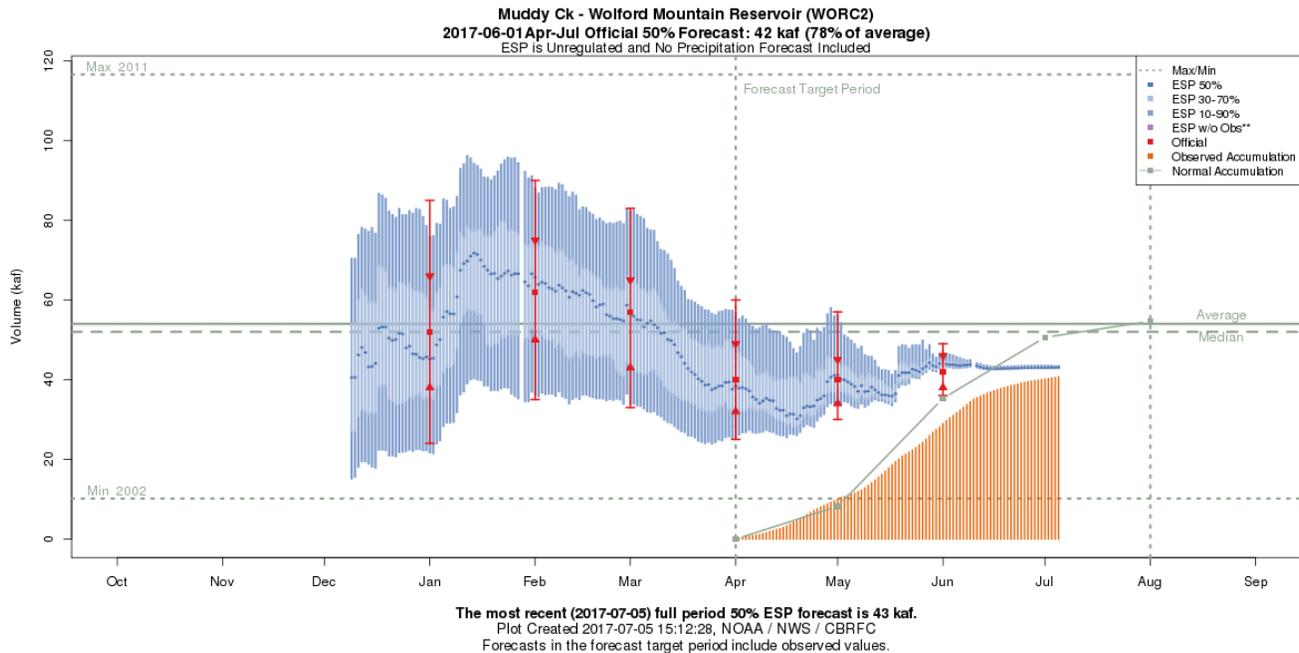
Wolford Reservoir Operations

The graph below shows Wolford operations. The reservoir filled and spilled on May 14th. April-July



WOLFORD MOUNTAIN AND ELKHEAD RESERVOIR OPERATIONS

inflow volume is expected to be 42,000 acre feet (78% of average, see graph below). From June 5th through 9th Wolford Reservoir participated in Coordinated Reservoir Operations (CROS) releasing about 600 cfs to augment the peak flow in the Grand Valley for the benefit of the Endangered Fish. Other facilities that participated in CROS include Willow Creek, Williams Fork, Green Mountain and Ruedi reservoirs, and the Moffat Collection System.



Maintenance Activities at Wolford Mountain Reservoir

Crest Rehabilitation

The crest rehabilitation project is awaiting approvals from the US Army Corps of Engineers and the Colorado State Engineer Dam Safety Branch.

Muddy Creek Stream Maintenance 2017 Work

Maintenance work on the mitigation area features this summer has included dredging of accumulated sediment at the Schwab Ditch headgate structure to improve diversions. A nationwide 404 permit was secured from the US Army Corps of Engineers for this work and the work completed in late June.

Ritschard Dam Deformation Investigation

The embankment continues to deform at established rates, with monthly monitoring and reporting to the State under conditional full storage status. The long term monitoring plan has been implemented. AECOM continues to prepare the documentation of the work supporting the decision to return to normal operations with the long term monitoring plan in place.

WOLFORD MOUNTAIN AND ELKHEAD RESERVOIR OPERATIONS

Outlet Works Maintenance Activities

A work plan to replace the seal in the 96-inch butterfly valve in the outlet works was scheduled for June. The seal needs to be replaced while the reservoir is spilling to maintain flow in Muddy Creek while the outlet works is out of service. To replace the seal the outlet tower and conduit need to be drained.

The main 96-inch sluice gate at the bottom of the tower has exhibited some leakage over the years. To date the leakage has been low enough that the 10-inch drain has cleared it from the conduit. When the operators closed the tower gates to dewater the outlet works for the butterfly valve seal replacement the main 96-inch gate experienced difficulty opening and closing and greater than previously experienced leakage was observed. Inspection by District staff using an underwater camera shows the bronze seals in the edges of the gate frame bolted to the concrete outlet tower have been displaced. Underwater camera inspection also showed a few of the stem guides displaced.

The main gate is 120 feet deep in the full reservoir. At 7500 feet in elevation the depth will require deep diving protocol. Marine Diving Services (MDS) was employed to realign the displaced stem guides which fortunately were shallow. Once the stem guides were realigned the main gate was operated open and closed while observing with the District's underwater camera. The main gate is available for operation if necessary to drain the reservoir but will not be used for routine operations. Options to replace or repair the main gate are under development and will be included in the 2018 budget proposal.

The outlet tower also has 3 – 4 foot by 6 foot gates at various depths. These gates were inspected by MDS and found to be in good working order. Review of temperature profile data for the reservoir shows the downstream delivery requirements can be met with the 3 - 4 foot by 6 foot gates. As the reservoir needs to be spilling to take the outlet works out of service the gate work and the seal work on the butterfly valve will be scheduled for spring of 2018.

Recreation Area Management

Recreation area use has been very high this season with several dates completely sold out.

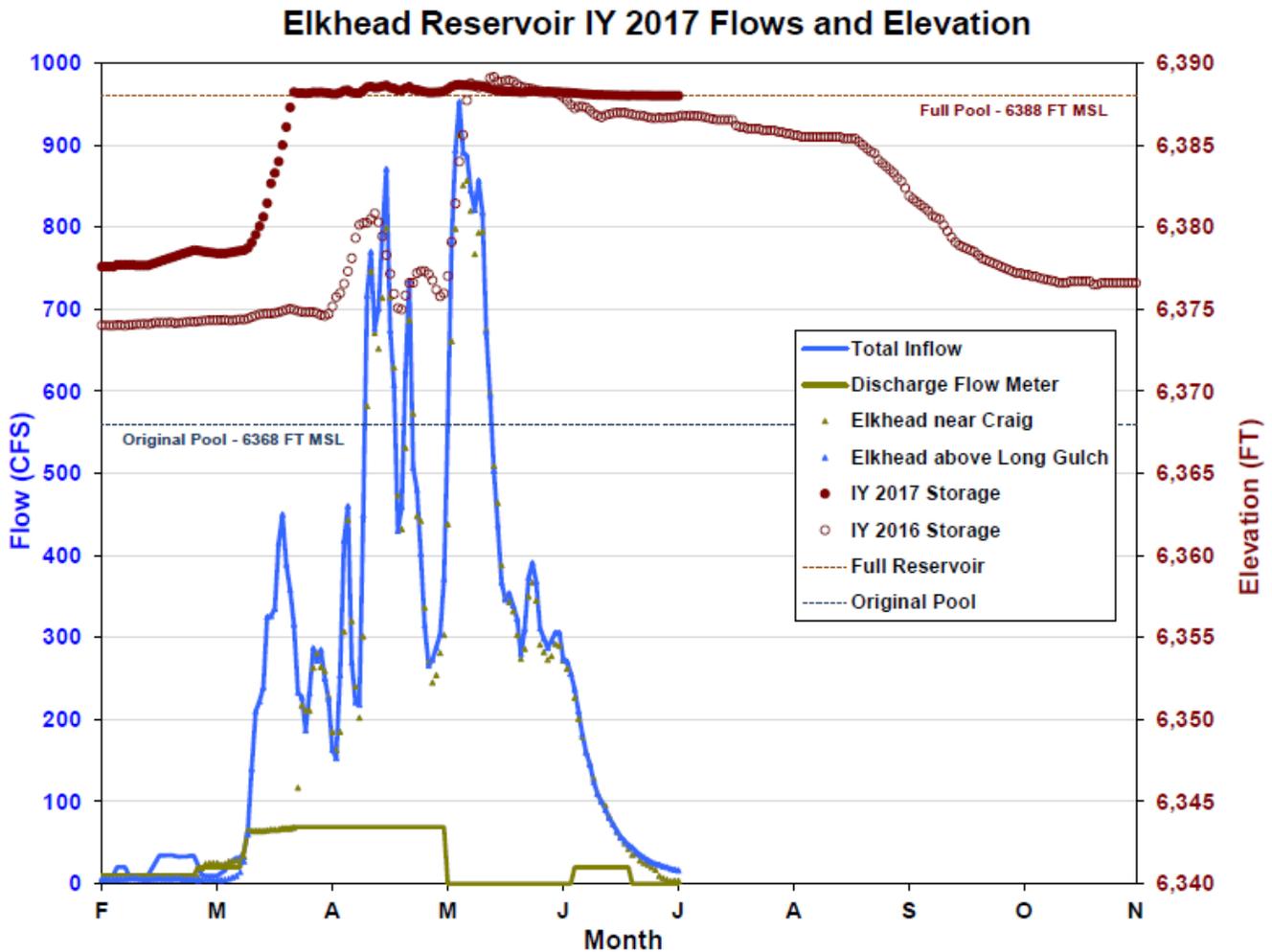
The agreement with Red Mountain RV Park (CA15032), our current recreation area concessionaire, is due to expire October 31, 2017. Red Mountain RV Park has been a concessionaire at Wolford Mountain Reservoir since 2002. Red Mountain RV Park has requested an extension of the existing agreement CA15032 to October 31, 2019. Staff has been pleased with the performance of Red Mountain RV Park in their various capacities at Wolford Mountain Reservoir and ***recommends the Board favorably consider the extension request.***

Recall in 2017 the agreement with Red Mountain RV Park was modified to focus only on recreation area management and the assistance with dam operations previously provided to the District was brought in house with the hiring of another full time operator.

WOLFORD MOUNTAIN AND ELKHEAD RESERVOIR OPERATIONS

Elkhead Reservoir Operations

Below is a graph of recent Elkhead Reservoir Operations. The reservoir filled and spilled on March 27th while releasing 70 cfs through the outlet works. The peak inflow during spill was 950 cfs which was discharged through the new fish net because the outlet was closed for maintenance. The CBRFC April-July runoff volume forecast into Elkhead is 67,000 acre feet, or 92 percent of average.



Maintenance Activities at Elkhead Reservoir

Elkhead Outlet Works Repairs

The refurbished guides for the 5 gate stems and the fish screen stem were replaced by Inland Potable Services with proper anchor bolts.

The 42-inch fixed cone valve was removed, refurbished, reinstalled and returned to service.

WOLFORD MOUNTAIN AND ELKHEAD RESERVOIR OPERATIONS

Annual review of the performance of the cathodic protection system was expanded to test whether the impressed current system was increasing the potential for corrosion elsewhere in the outlet works like at the fixed cone valve. No downstream effect of the impressed current system was detected.

Elkhead Spillway Fish Barrier Net

The presence of the spillway fish barrier net allowed the outlet works to be taken partially out of service for refurbishment. Recall Elkhead has 2 outlets (a lesson learned from Wolford and Taylor Draw) so releases through the outlet works were still possible if necessary. The net and debris barrier appear to have performed well and early Colorado Parks and Wildlife assessments show no fish downstream. The first annual dive inspection of the net will occur later in July.