Colorado River District
Protecting Western Colorado Water Since 1937

MEMORANDUM
October 2, 2018

TO: **BOARD OF DIRECTORS**
ANDY MUELLER, GENERAL MANAGER
PETER FLEMING, GENERAL COUNSEL
JOHN CURRIER, CHIEF ENGINEER

FROM: MIKE EYTEL, SENIOR WATER RESOURCE SPECIALIST *ME*

SUBJECT: GRAND LAKE CLARITY ADAPTIVE MANAGEMENT UPDATE

This memo is provided as an update for discussion. No Board action is requested.

STRATEGIC INITIATIVE(S): 3B, 3C, 3D, 5C, 7A, 7D, 8C, 8D, 9A, 10

The River District is a party to the Grand Lake Clarity MOU along with Grand County, NWCOG, Northern Colorado Water Conservancy District, and the Bureau of Reclamation (BOR). The primary purpose of this MOU is to establish an adaptive management process while Reclamation conducts planning and NEPA to evaluate alternatives to improve Grand Lake Clarity. The clarity goal in Grand Lake, as established by the MOU is an average Secchi depth of 3.8 meters with a minimum Secchi depth of 2.5 meters. The MOU established an Adaptive Management Committee (AMC) which meets weekly during the clarity period of July 1 – September 10th to evaluate water quality data and assist the AMC in making management decisions.

This year based on forecasts and water quality model runs the Bureau of Reclamation recommended to the AMC to limit C-BT diversions through the Alva B. Adams Tunnel to 220 cfs on weekend's and 440 cfs on weekdays from July 1 – September 10, and continue to monitor Grand Lake and Shadow Mountain Secchi depths and water quality. While the hydrology did not quite conform to the models, the plan to operate Adam's Tunnel between 220 cfs and 440 cfs provided enough operational flexibility to maintain power production and supplemental irrigation supplies on the east slope, and still meet the clarity goals. This year's average Grand Lake Clarity came in at 4.58 meters with a minimum of 3.9 meters. Figure 1 below shows average Secchi depth for Grand Lake (dotted blue line) and Shadow Mountain Reservoir (dotted green line) along with Farr Pumping and inflows into Grand Lake. As you can see the clarity in both Grand Lake and Shadow Mountain remained relatively consistent over the season with minimal degradation. The clarity in both Grand Lake & Shadow Mountain shows how Grand Lake's clarity is dependent on the quality of water being received from Shadow Mountain. Generally the depth of clarity in Grand Lake responds to increases/decreases in clarity in Shadow Mountain.

While the jury is still out on the causes and effects of operations and hydrology on clarity in Grand Lake, the 2018 Grand Lake Clarity Adaptive Management season was on overall success. This was the third year of operations for the AMC, and all parties have shown commitments to the process and willingness to address concerns. The next steps will be to evaluate the water quality data and operations to see if the water quality model can simulate this year's results, and be used in preparing operational models for 2019. River District staff will continue to work with the AMC and Grand Lake MOU partners to assess data and implement effective operational changes with the goal of improving Grand Lake clarity.
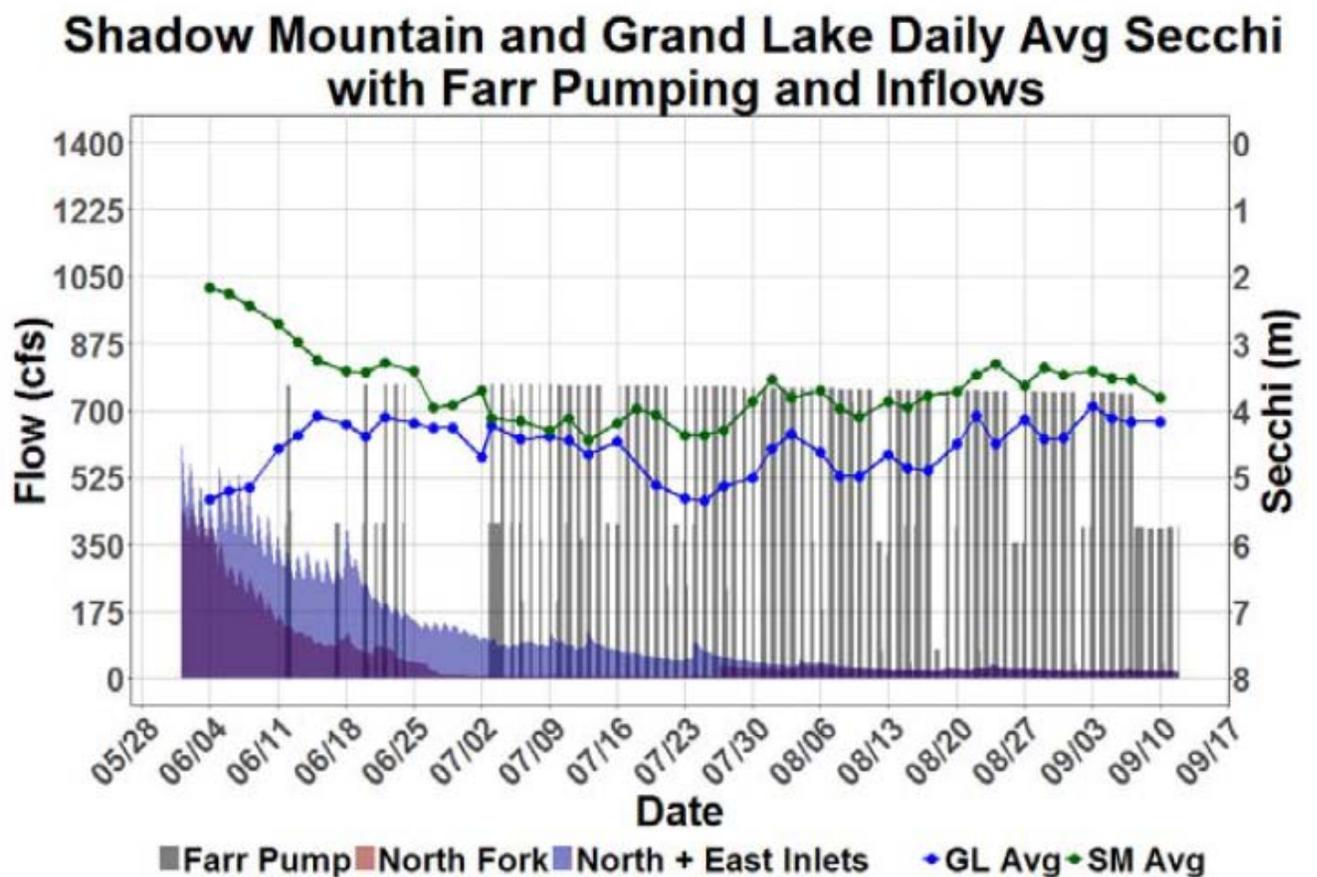

Figure 1. Shadow Mountain and Grand Lake Daily Average Secchi depth with Farr Pumping and Inflows.