Memorandum – DRAFT

To: URGWOM Technical Team Members
Date: May 15, 2017
Subject: Notes of May 9, 2017 URGWOM Technical Team Meeting

These notes summarize the salient matters discussed at the May 9, 2017 Upper Rio Grande Water Operations Model (URGWOM) Technical Team meeting. The meeting began at 9:00 am in the conference room at the NM Interstate Stream Commission office in Albuquerque, NM. An attendance list is included on page four.

The principal Agenda topics include a discussion of changes to Elephant Butte Reservoir releases; MRGCD historical demand; Platoro Reservoir operations, Lower Rio Grande demand-based rules, Middle Rio Grande crop stress coefficients developed using Landsat imagery, and the May1st snowmelt runoff forecast and model.

Elephant Butte Reservoir release patterns

Lucas presented a report on the change in Elephant Butte Reservoir release pattern implemented by Reclamation to optimize power revenues and the modification of URGWOM model and rules to simulate the new operation. Reclamation is releasing water incrementally consistent with the capacities of the generators (± 625 cfs, 1,300 cfs, and 1,900 cfs) to minimize by-pass of the generators within the constraint of operating levels of Caballo Reservoir. Lucas described changes to Rule 18 necessary to implement the new release pattern. The revised rules were tested using the April, 2017 AOP model and a planning model (1980-2010). Lucas presented a summary showing the reduction in by-pass amount and increase in power generation due to change in release pattern.

During his work Lucas uncovered three errors in the planning model run and the Team discussed reasons for and potential solutions to address the errors. The Team recognized that the planning model may not be the best environment for the optimum use of Rule 18. Reclamation will implement these proposed changes to the Elephant Butte Reservoir operating rules and model.

Middle Rio Grande Conservancy District historical demand

Jesse reported on his work to develop demand curves for MRGCD diversions based on wet, average or dry water supply conditions. The MRGCD demands were obtained from river operations telephone conference calls. He reviewed and compared the records of crop demands, diversions, precipitation and El Vado Reservoir storage and was unable to detect a correlation

that would assist in development of predictive demand curves. Carolyn suggested that MRGCD diversion data from the ET Toolbox be included in his review. The MRGCD diversion data are also available in the URGWOM database (DSS). Jesse recommended that the historic diversions data be included with the accounting model.

Platoro Reservoir operations

Jesse presented a report on the status of his work on the review of Platoro Reservoir operation (conservation storage only). Jesse reported on email correspondence he has had with Craig Cotten about the three types of conservation storage in Platoro Reservoir: storage in lieu of diversion, storage for release to meet compact deliveries and its own decreed storage right. He presented plots of model runs for 1982-2011 demonstrating the historical amounts of storage under each type of storage. Jesse proposed implementing a decree storage approach where Platoro Reservoir conservation storage accounts are included in the water right solver, under conditions that storage would have to be released by the end of the year, except for decreed water right storage which may be carried over into the following year. Currently the water right solver is applied to water rights downstream of Platoro Reservoir. Jesse stated that Tetra Tech would modify the model to implement the changes in Platoro Reservoir conservation storage accounting.

Lower Rio Grande demand based rules

Nick and Steve reported on the following items related to the development of lower Rio Grande release patterns:

- The order of certain Caballo Reservoir and Elephant Butte Reservoir operating rules were rearranged to address model error reports;
- The model is not properly simulating historic Caballo Reservoir flood control releases made in 1986,1994 and 1994;
- As previously reported, the Caballo pattern release coefficients do not sum to zero when the coefficient is changed during the year to reflect runoff forecast changes. A previously suggested fix that would normalize the coefficients does not improve the model results. The simulated flood control releases are not consistent with historic values and Hydros recommends against implementing the step.
- The change made in response to a suggestion that the runoff forecast volume should be included in estimates of Project Storage did not improve model results. Hydros will look deeper into this as there may have been human judgement influence in the operation of the reservoir.

Not all of the historic record is based on the D3 operating rules, which were implemented relatively recently and therefore the historic operations cannot be matched precisely. Steve said that the Hydros work on the pattern based rule task is complete.

Hydros also discussed their work on the priority of storage accounts from which ESA target releases are made. The Team provided input on the priority list and Hydros will proceed to complete the task as outlined.

URGWOM stress coefficient using Landsat imagery

Brian presented the results of his investigation into the development of crop stress coefficient in the middle valley that would relate actual crop consumptive use to potential consumptive use. Brian had circulated a copy of his Report prior to the meeting. The work was based in part on work previously done in the Middle Valley by Rick Allen of a METRIC analysis of 2002 Landsat imagery. Brian described the methods used to estimate crop coefficients on 44 alfalfa fields in the Middle Valley between Bosque Farms and Polvadera. The results of the analysis suggest that a stress coefficient may average between 0.85 and 0.94, where the current factor to relate actual to potential consumptive use is 80%. Nabil pointed out that the 80% is not a crop stress coefficient but a model calibration coefficient. Brian requested that comments on his report be provide within the next two weeks.

May 1st runoff forecast model run results

Marc presented the results of the model runs based on the May 1st snowmelt runoff forecast. The May 1st forecast is very similar to the April 1st forecast. The El Vado Reservoir inflow increased and the Lobatos flow is based on the upper 10% confidence interval based on input from Colorado officials who think the NRCS forecast may underestimate actual runoff.

The next meeting of the Team has been scheduled for June 20, 2017 (9:00am at the USGS office) and the agenda for this meeting will include discussion of Reclamation's ET Toolbox. Also, a meeting to be held on July 11, 2017 will be for the purpose of discussing ET as it relates to URGWOM as well as the status and use of the ET Toolbox, location TBD.

The meeting adjourned at about 12:15 pm.

ATTENDANCE LIST
URGWOM TECHNICAL TEAM MEETING
May 9, 2017

NAME	REPRESENTING
Marc Sidlow	USACE
Jesse Roach	Tetra Tech / USACE Contractor
Kyle Douglas-Mankin	USGS
William Miller	WJM Engineers/USACE Contractor
Nabil Shafike	USACE
Carolyn Donnelly	USBR
Lucas Barrett	USBR
Ken Richards	USBR
Cindy Stokes	NM Interstate Stream Commission
Brian Westfall	Keller-Bliesner Engineers / BIA Contractors

Those participating via telephone conference:

Nick Mander	Hydros Consulting
Steve Setzer	Hydros Consulting
Conrad Keyes Jr.	USACE Contractor
Jerry Melendez	USBR
David Neumann	CADSWES
Zhuping Sheng	Texas A&M University / Paso del Norte Watershed Council