Minutes of Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Wednesday, February 9, 2022

A meeting of the Colorado River Board of California (Board) was held on Wednesday, February 9, 2022, in a hybrid format, with in-person and webinar options available, pursuant to Governor Newsom's Executive Order N-1-22 issued on January 5, 2022.

Board Members and Alternates Present:

David De Jesus (MWD Alternate)
Dana B. Fisher, Jr. (PVID)
John B. Hamby (IID)
James Hanks (IID Alternate)
Jeanine Jones (DWR Designee)
Delon Kwan (LADWP Alternate)
Jim Madaffer (SDCWA)
Peter Nelson, Chairman (CVWD)
Glen D. Peterson (MWD)
David R. Pettijohn, Vice Chairman (LADWP)
Jack Seiler (PVID Alternate)
David Vigil (DFW Alternate)

Board Members and Alternates Absent:

Castulo Estrada (CVWD Alternate)
Christopher Hayes (DFW Designee)
Henry Kuiper (Public Member)
Mark Watton (SDCWA Alternate)

Others Present:

Steve Abbott
Brian Alvarez
Justina Arce
Jim Barrett
Bert Bell
Robert Cheng
Gary Croucher
Dennis Davis
Dan Denham
JR Echard
Adel Hagekhalil
Chris Harris
Bill Hasencamp
Joanna Hoff
Michael Hughes
Ned Hyduke
Rich Juricich
Laura Lamdin
Tom Levy
Victor Lujan
Enrique Martinez
Aaron Mead
Jessica Neuwerth
Kay Pricola
Jessica Rangel
Shana Rapoport
Angela Rashid
David Rheinheimer
Kelly Rodgers
Shanti Rosset
Tom Ryan
Roberta Saligumba

Alexi Schnell
Keith Scoular
Tina Shields
Darren Simon
AJ Slagan
Gary Tavetian
Sara Tucker
Petya Vasileva
Cherie Watte
Jerry Zimmerman

CALL TO ORDER

Vice Chairman Pettijohn announced the presence of a quorum and called the meeting to order at 10:05 a.m.

OPPORTUNITY FOR THE PUBLIC TO ADDRESS THE BOARD

Vice Chairman Pettijohn invited members of the audience to address the Board on items on the agenda or matters related to the Board. Hearing none, Vice Chairman Pettijohn moved to the next item on the agenda.

ADMINISTRATION

Vice Chairman Pettijohn asked for a motion to approve the December 14, 2021, meeting minutes. Mr. Hamby moved that the minutes be approved, seconded by Mr. Peterson. By roll-call vote, the minutes were approved. Ms. Jones and Mr. Vigil abstained.

COLORADO RIVER BASIN WATER REPORTS

Colorado River Basin Report

Mr. Juricich reported that as of February 7th, the water level at Lake Powell was 3,530.43 feet with 6.27 million-acre feet (MAF) of storage, or 26% of capacity. The water level at Lake Mead was 1,067.00 feet with 8.96 MAF of storage, or 34% of capacity. The total system storage was 21.76 MAF, or 36% of capacity, which is 5.50 MAF less than system storage at this time last year.

Mr. Juricich reported that as of February 2nd, for Water Year-2022 (WY-2022), the observed January inflow to Lake Powell was 0.25 MAF, or 74% of normal. The February inflow

forecast to Lake Powell is 0.24 MAF, or 66% of normal. The forecasted unregulated inflow into Lake Powell for WY-2022 is 7.26 MAF, or 76% of normal and the WY-2022 forecasted April to July inflow to Lake Powell is 5.0 MAF, or 78% of normal. Mr. Juricich reported that overall precipitation conditions in the Upper Colorado River Basin were 108% of normal and the current Basin snowpack is 100% of normal.

Mr. Juricich presented a graphic displaying WY-2022 precipitation conditions. He stated that precipitation conditions in October and December 2021 were well above average for most of the Basin, while conditions in November 2021 and January 2022 were below average throughout the Basin. He added that February's precipitation conditions appear to be starting off dry as well. Mr. Juricich reported on current snow water equivalent (SWE) conditions across the Basin, noting that current snowpack conditions are doing well due to above average precipitation that the Basin received in December.

Mr. Juricich reported on the Colorado Basin River Forecast Center (CBRFC) February 1st Water Supply forecasts for the April to July runoff period. He stated that across the Upper Basin the forecasts ranged from 65% to 95% in the Upper Green Basin, 80% to 105% in the Upper Colorado Basin to 78% of normal for Lake Powell River Basin. He noted that the forecast assumes normal precipitation conditions moving forward for the rest of the year.

Mr. Juricich reported on the January 24-Month Study projections for reservoir elevations for Lakes Powell and Mead. He stated that the projections include the implementation of the 500-Plus Plan and the assumptions also include approximately 125,000 AF of additional conservation in 2021, which was not part of the original ICS plan, an additional 125,000 AF of new conservation in 2022, and 90,000 AF of additional conservation in 2023. He noted that the projections show that Lake Powell's elevation is very close to its critical elevation of 3,525 feet and is projected to receive 7.2 MAF of unregulated inflow and a projected release of 7.48 MAF in WY-2022. For Lake Mead, the projections show that Lake Mead will hover around the Tier II elevation of 1,050 feet for the remainder of 2022, even with the inclusion of the 500-plus plan actions.

Mr. Juricich reported that through February 3rd, the Brock and Senator Wash regulating reservoirs captured 10,865 AF and 6,722 AF, respectively. He also reported that the excess deliveries to Mexico were 380 AF, compared to 5,322 AF this time last year. Finally, the total amount of saline drainage water bypassed to the Cienega de Santa Clara in Mexico was 135,117 AF, through December 31, 2021.

Mr. Juricich reported on the CBRFC's analysis that compared the April to July streamflow volumes for the climate normal periods of 1981 to 2010 and 1991 to 2020. He stated that the averages based on the new normal period were 4% to 20% lower across different watersheds.

Vice Chairman Pettijohn inquired about whether there has been a study developed to determine how much water is needed in the Cienega de Santa Clara to keep the environment in a healthy condition. Mr. Harris stated that to his knowledge, there has never been a study done that has directly examined this issue. He added that close to 50% of the current flow would probably be needed to maintain some level of marsh habitat and healthy aquatic water quality. He stated that the region has Desert Pupfish, and two species of Clapper Rail and a whole host of waterfowl. Ms. Neuwerth noted that flow to the Cienega was restricted for six months in 2020 and scientists are still evaluating how the Cienega was impacted from it and that their evaluation is likely to yield good data on the issue. Mr. Harris added that the Cienega is hydraulically attached to the estuary in the region and without the flow to the Cienega, saltwater intrusion would be an issue. He stated that he believes that 50,000 to 60,000 AF of the minimal flow is needed to maintain a healthy habitat.

State and Local Report

Ms. Jones, representing the California Department of Water Resources (DWR), reported that precipitation conditions in December were great and brought the State to over 150 percent of average at the end of December. She noted that precipitation conditions have dropped closer to normal in January. Ms. Jones added that normally, reservoir storage reflects hydrology, but due to the very wet December, reservoir storage conditions are almost the same level as over a year ago. She noted that December's precipitation wiped out the water year declines that occurred over the past full year. Ms. Jones stated that the snow water content at the end of December was above average, but currently, conditions have declined to 90% of average at a statewide level because of the lack of precipitation. She stated that the first half of February is expected to be dry.

Ms. Jones reported on DWR's new website called California Water Watch. She explained that it was launched in response to the California Natural Resources Agency (CNRA) drought report and the Governor's drought emergency proclamation. She stated that it draws from DWR's and others' websites to collect hydrologic data in one place and make it user friendly for the public and media. She explained that it uses gridded spatial precipitation and temperature data to support various climate analyses.

Ms. Jones also reported the website's GIS tool that examines and compares drought risk across the State. She explained that the tool can be used to look at drought conditions going back to 1900 and can be used to compare current periods as well. She stated that the website can also be used to examine data on snowpack and reservoir storage. In addition, the website utilizes USGS streamflow data, as well as satellite-based soil moisture and vegetation conditions using the Evaporative Stress Index.

Ms. Jones reported on DWR's Aerial Remote Sensing of Snowpack (ARSS) project and showed a short video about the Airborne Snowpack Observatory (ASO) research project. She explained that using aircraft to monitor snowpack is a new technology that NASA has been piloting for a while and DWR has been contributing funding to the effort with NASA and with a few watersheds in California. She stated that the data is great, but expensive. She explained that DWR's current snow surveying project called the California Cooperative Snow Survey Program, which coordinates the manual measure of snow survey data, cost about $1 million a year. For comparison, if DWR were to buy ASO data for the entire Central Valley watersheds, it would cost between $15 to $25 million a year. She added that historical funding level for purchasing this data on an experimental basis is $4 million a year. She stated that the ASO data produces better data coverage and can improve runoff forecasts. Ms. Jones added that the long-term benefit of the ASO data is to improve modeling techniques for runoff, which is needed in the Colorado River Basin. She added that during NASA's work, several agencies in Colorado contributed funding to pilot projects in some watersheds like the Gunnison. Ms. Jones explained further that the spatial snowpack data supports physically based watershed models to improve snowmelt runoff forecasting.

Vice Chairman Pettijohn remarked that he supported DWR's efforts to utilize ASO technology and the technology's ability to make informed water management decisions that can save water and money. He added that the technology costs are expensive, but the opportunity costs of lost water are quite significant as well. Mr. Pettijohn stated that utilizing this technology in the Upper Basin watersheds might improve forecasting and management of drought operations.

Responding to a question from Mr. Zimmerman about whether the efficacy of the ASO has been quantified, Ms. Jones stated to get a good runoff forecast, you need good data and good modeling capability. She stated that currently, most people are utilizing old-fashioned statistical regression equation approaches and those with more funding are switching to physically based watershed models. She explained that with the combination of data and modeling you can get within 3% of accuracy of a Basin's actual runoff, which is lucky due to the limits of accuracy of this type of work. She added that it also depends on the watershed, stating

that the statistical regression approach works better if watershed conditions are close to the long term historical average, but works poorly, in cases like last year, when conditions diverged greatly from average. Ms. Jones further explained that DWR has been funding ASO in the San Joaquin Valley for several years, noting that the value has been to provide short term reservoir guidance, more than using the water supply forecasting data. She stated that the information on snowpack coverage alone is great for improving forecast for approving operations of dams and managing releases more closely. She explained that there has been very little work done to measure the efficiency of improving a runoff forecast because so few people are using basin models at this time, noting that to get the "biggest bang for the buck," better data must be combined with a good model. Ms. Jones explained further that due to climate change it is best to move away from the old statistical regression approach. She added that DWR's approach to runoff forecasting is more of an art than science noting that probably 30% to 50% of the process is based on good judgement and not math. She concluded her response by stating that the long-term goal is to move to a more modeling approach to see real improvements in the runoff forecast.

Mr. Harris remarked on ASO's ability to improve reservoir and water management. Ms. Jones explained that DWR is funding ASO in the San Joaquin River Basin because it is a high elevation watershed, and it is not covered by manual snow survey measurements. She stated that the Colorado River Basin does not have the same tension between water supply and flood forecasting compared to the San Joaquin Basin and the contributions of individual reservoir operations is less necessary than it is in the San Joaquin. She concluded that the benefits of ASO in the Basin would be to improve runoff forecasting rather than improving operations.

Mr. Pettijohn added that Colorado has been adamant about improving the accuracy of forecasting to efficiently allocate water during the season and better manage water deliveries. Mr. Harris added that Colorado is working to improve USGS stream gauging accuracy to better refine the consumptive use model that is used to regulate water rights over the course of an irrigation season or water year. He stated that Colorado's work will bring improved accuracy to the consumptive use reporting that Reclamation compiles in the five-year Consumptive Uses and Losses Report. Mr. Harris reported that there is a pilot project in the San Juan Mountains in southwestern Colorado to collect ASO data and look at broader applicability, adding that the states involved in weather modification have also been look at the applicability. He remarked that the Lower Basin States are collectively funding $600,000 annually for weather modification which would not cover the cost for ASO data. Mr. Harris remarked that Reclamation is starting to stand up grant programs to scale up ASO data collection efforts, noting that it may be worthwhile to use ASO in the Upper Green basin and headwaters.

Ms. Jones remarked that the price for ASO has come down quite a bit coming from a NASA operated project to the private sector. She explained that LIDAR is a commercially available surveying technology, but it is expensive. She stated that she does not see the cost decreasing substantially so it needs to be used where it can have the most impact.

Mr. Peterson, representing The Metropolitan Water District of Southern California (MWD), reported that as of February 1st, reservoir storage is 77% of capacity. The Colorado River Aqueduct is shut down for annual maintenance until February 28th and will ramp up to an eight-pump flow through March. He stated that the 2022 diversion target is 1.089 MAF and as of February 2nd, MWD has 800,000 AF in storage which is about half of the amount typically required in a year. He added that deliveries for the year were 93% of the 10-year average and 15,083 AF of water was delivered to Desert Water Agency and Coachella Valley Water District in 2021. Mr. Peterson concluded that MWD has a 15% allocation for State Water Project supplies.

Vice Chairman Pettijohn, representing the Los Angeles Department of Water and Power (LADWP), reported that precipitation conditions in the Eastern Sierra in December were currently good but conditions in January were below average. Mr. Pettijohn stated that the SWP exclusive areas of MWD's service territories areas can now rely on a 15% allocation for the SWP, instead of only health and safety allocations. He noted that it was a "wakeup call" for LADWP after experiencing two dry years on the SWP and that MWD is taking proactive measures to address issues with system reliability. Chairman Nelson commented that both municipal districts and agricultural contractors are dependent on SWP supplies, and it has been interesting to see the State prioritize municipal health and safety issues over food production.

STATUS OF COLORADO RIVER BASIN PROGRAMS

Status of the Glen Canyon Dam Adaptive Management Program

Ms. Neuwerth reported that the Glen Canyon Dam Adaptive Management Program (GCDAMP) held its annual science meeting for three days in January.

Ms. Neuwerth shared a slide showing native and non-native fish presence below Glen Canyon Dam to Lake Mead. The figure showed that near Glen Canyon Dam the fish population is dominated by non-native trout. The Little Colorado River has historically been the stronghold for humpback chub. The middle third of the river area shown in the figure is almost completely native fish habitat. Ms. Neuwerth reported that as the water level in Lake Mead has dropped over the last ten years, the area above Pearce Ferry rapid has become dominated by native fish while Lake

Mead remains dominated by non-native fish. Pearce Ferry rapid has emerged as the water level in Lake Mead has fallen and appears to be serving as a barrier for fish passage.

Ms. Neuwerth reported that there tend to be non-native fish in both reservoirs. The fish are in the top 20 to 25 feet of the water column. As the reservoir elevations decline, those fish are getting closer to the intakes. A concern for the GCDAMP is that as the lake level gets closer to the intakes, more non-native fish may pass through the dam. Ms. Neuwerth reported that a lot of fish die passing through the dam but that as more fish pass through the dam, the likelihood increases that enough fish will survive the passage to start a new population below the dam.

Ms. Neuwerth reported on experimental actions at Glen Canyon Dam. Researchers reported on the spring disturbance flow conducted last year, which consisted of a low flow from the dam during a repair to the apron of the dam followed by a maximum release within the power plant capacity. Ms. Neuwerth reported that it does not appear that the experiment had any negative effects, but there does not appear to have been a strong biological response.

Ms. Neuwerth stated that researchers reported on what the program refers to as "bug flow" experiments conducted in 2018, 2019, and 2020. The purpose of bug flows is to provide periods of low, steady flow to help insect reproduction. Ms. Neuwerth reported that the results of bug flows have been mixed, with some insect species responding, although not necessarily in ways that were predicted. Ms. Neuwerth reported that it is likely there will be more Bug Flows happening going forward.

Ms. Neuwerth reported that funding for the program has been see-sawing. The program has traditionally been funded by power revenues from the Colorado River Storage Project in the Upper Basin. However, recently funding for the GCDAMP has been going back and forth between hydropower revenues and appropriations. GCDAMP was anticipated to be funded through appropriations in FY2022; however, the federal government has not currently passed a budget for FY2022 and is relying on a continuing resolution, which funds programs at the prior years' funding level. However, in FY2021, the GCDAMP received hydropower funding rather than appropriated funding, and therefore is not supported by the continuing resolution. Ms. Neuwerth reported that Reclamation has been able to continue the program at its budgeted level in the interim, but passage of a FY2022 budget will provide greater certainty for FY2022 program operations.

Mr. Harris asked if going forward the program is likely to be funded through the appropriations process. Ms. Neuwerth responded that she thinks it will likely be a mix of hydropower and appropriations going forward.

Mr. Tavetian provided a brief update on the status of the ongoing Long-Term Experimental and Management Plan (LTEMP) litigation. The suit was filed in 2019 by a group of NGOs. The fundamental argument brought by the NGOs was that the Bureau of Reclamation and National Park Service violated NEPA by failing to consider new evidence about climate change and its effect on the flows of the Colorado River below Glen Canyon Dam. The plaintiffs also claim that the alternatives considered in the LTEMP were too narrow. In particular, the NGOs wanted more consideration given to the Fill Mead First proposal, operating Glen Canyon Dam as a run-of-the-river facility, and decommissioning Glen Canyon Dam. The plaintiffs recently filed a motion for summary judgement, and the United States is expected to file its opposition to that motion by March 11, along with a cross-motion for summary judgement. Motions for summary judgement by the U.S. and other interveners are expected to be completed by June 10. Mr. Tavetian reported that the court will be looking at these summary judgements and making a determination.

Status of the Lower Colorado River Multi-Species Conservation Program

Ms. Neuwerth reported that Laura Vecerina, long time deputy director of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) retired at the end of January.

Ms. Neuwerth reported that the LCR MSCP held its annual research meeting on January 27. Ms. Neuwerth reported that there was much discussion of the monitoring occurring in Mexico associated with the Delta and that it has been helpful in providing comparable results regarding species and habit use in the U.S. and Mexico.

Ms. Neuwerth reported that the Financial Work Group of the LCR MSCP will hold a meeting later in the month to go through the budget, work plan, and previous expenditures.

GENERAL ANNOUNCEMENTS

Weather Modification Program Cloud Seeding Operations

Mr. Harris provided an update on the Weather Modification Program, and current cloud seeding operations in the Upper Basin. Season-to-date cloud seeding operations resulted in close to 6000 hours of operations in the State of Colorado, 4000 hours in Utah, and 1000 hours in Wyoming. A question was asked about what the hours signify, and Mr. Harris clarified that the hours represent operation of cloud seeding equipment.

Drought Response Operations Plan Framework

Mr. Harris provided an update to the Board on the Upper Colorado River Draft Drought Response Operations Plan Framework. Reclamation and the Upper Basin States held a webinar on January 28, 2022, to discuss the draft drought operations response framework. The goal of the Framework is to minimize the risk of Lake Powell declining below a target elevation of 3,525 feet. Board and California agencies provided comments to Reclamation and Upper Basin States. Mr. Harris reported that collectively, within California, the agencies collaborated to compile a uniform California package of comments that was sent to Reclamation and the Upper Division states. Reclamation and the Upper Division states spent the past couple of weeks looking over those comments and recently provided an initial response back. Reclamation and the Upper Division States need to have their proposed calendar year 2022 plan ready to roll out by the end of the April time frame with the April 24-month study report.

Washington D.C. Updates

Mr. Harris reported that the federal government continues to operate under a Continuing Resolution that expires on February 18th. There are some efforts underway that could lead to some west wide and Colorado River Basin focused Water Resources Development activities and legislation. The Supreme Court will once again interpret the reach of the Clean Water Act. The Justices agreed to hear Sackett v. EPA, a case in which an Idaho couple is arguing for a more limited definition of the law.

Next Scheduled Board Meeting

Finally, Mr. Harris noted that the next meeting of the Colorado River Board would be held on March 9, 2022, and would be held in a hybrid format, with in-person and webinar options available, pursuant to Governor Newsom's Executive Order N-1-22 issued on January 5, 2022.

ADJOURNMENT

With no further items to be brought before the Board, Vice Chairman Pettijohn adjourned the meeting at 11:19 a.m.