

**BUREAU OF RECLAMATION
NAVAJO RESERVOIR COORDINATION MEETING
AUGUST 23, 2016 1 p.m.
MEETING NOTES**

SENT VIA FAX AND E-MAIL

Dear Interested Party:

Enclosed is a summary of our August 23, 2016, meeting to coordinate Reclamation's operation of the Navajo Unit. The meeting was held at the Civic Center in Farmington, New Mexico.

Highlights of the meeting include:

- Spring Peak Release began May 18th and ended July 11th. Total volume over base was 340,000 acre-ft.
- The peak of 5,000 cfs was not reached during the Spring Peak Release this year due to safety concerns in the channel.
- Reclamation has been working closely with the US Army Corps of Engineers, Reclamation's Technical Service Center, and San Juan County Office of Emergency Management to evaluate channel capacity issues.
- Summer and fall releases will likely range between 400 and 700 cfs.
- Expected end of water year reservoir elevation under the August Most Probable Forecast is 6055 ft.

Copies of the material presented and past meeting notes are available online at:

<http://www.usbr.gov/uc/wcao/water/rsvrs/mtgs/nmcurrnt>

If you have any suggestions on improving the operation meetings or the summaries of the meetings, please let us know. The next meeting will be held on Tuesday, **January 24, 2017 at 1:00 at the Farmington Civic Center, Farmington, New Mexico (200 West Arrington Street).**

NAVAJO UNIT OPERATIONS MEETING

August 23, 2016 1pm

Participation: This meeting was held in Farmington, New Mexico at the Civic Center. The attendance list is attached.

Purpose of Meeting: The purpose of these meetings, held annually in January, April, and August, is to gather input for determining upcoming operations for Navajo Reservoir. This input is used in Reclamation's development of an overall 24-month study for operation of Reclamation projects in the Upper Colorado River Basin, which includes plans for Glen Canyon, Flaming Gorge, Aspinall Unit and Navajo. Input from individuals, organizations, and agencies along with other factors such as weather, water rights, endangered species requirements, flood control, hydro power, recreation, fish and wildlife management, and reservoir levels, will be considered in the development of these reservoir operation plans. In addition, the meetings are used to coordinate activities and exchange information among agencies, water users, and other interested parties concerning the San Juan River and Navajo Reservoir.

Review of Water Year 2016 Operations to date

The Spring Peak Release began on May 18th with a five-day ramp up reaching 4,600 cfs on May 24th. Due to safety concerns expressed by the San Juan County, New Mexico, Office of Emergency Management (OEM), a rapid decrease was made May 25th, down to 2,000 cfs. The temporary decrease was to aid in the recovery of debris in the river and address issues with several structures in the river that posed a risk to public safety. Reclamation, in coordination with the OEM continued increasing the release with the ultimate goal of reaching 5,000 cfs two more times. Due to continued safety concerns expressed by the OEM, Reclamation held the release at 4,200 cfs for the remainder of the Spring Peak Release. Ramp-down began July 1st and the Spring Peak Release concluded July 11th.

The total Spring Peak Release volume over the base release was 340,000 acre-feet. This is 18,000 acre-feet less than was anticipated at the start of the release. Resulting flows at the San Juan at Four Corners USGS gage were as follows:

- Days > 2500 cfs: 52
- Days > 5000 cfs: 35
- Days > 8000 cfs: 8
- Max instantaneous daily flow: 8,740 cfs
- Max daily average flow: 8,490 cfs

The Spring Peak Release was coordinated with numerous federal, state, and local agencies on a daily basis. Agencies involved in the coordination effort included:

- Reclamation
- US Army Corps of Engineers Albuquerque District (USACE)
- National Weather Service
- CBRFC
- San Juan County, NM OEM
- San Juan County, UT OEM

- US Fish and Wildlife Service (SJRIP)
- Navajo Nation EPA
- Navajo Nation OEM
- City of Farmington Utilities
- US Geologic Survey (USGS)

Since the Spring Peak Release ended, precipitation has been overall below-average in the San Juan River Basin. Releases have ranged between 400 cfs and 650 cfs to maintain the target baseflow in the critical habitat reach.

Current Conditions

The reservoir elevation on August 22, 2016 was 6,059.64 feet which corresponds to approximately 1,343,234 acre-feet of storage (79% full). The current reservoir release to the river is approximately 680 cfs.

The future summer and fall releases will likely range from 400 to 700 cfs. The expected end of year reservoir elevation under the August Most Probably forecast is 6,055 feet.

Water Year 2017 Forecasts

Releases through the reset of 2016 are likely to range between 400 and 700 cfs to maintain the target baseflow in the critical habitat reach.

La Nina watch is underway. CPC indicates a chance for drier-than-average conditions in the San Juan River Basin. However, it was reiterated that the El Nino Southern Oscillation is not a consistent predictor of snowpack in our basin. For example, 2016 was a strong El Nino year, but the San Juan River Basin saw below-average snowpack.

The most probable April through July 2017 modified unregulated inflow, based on the Colorado Basin River Forecast Center (CBRFC) August inflow forecast, is 655,000 acre-feet, which is 90 percent of the 30-year average. The minimum probable and maximum probable April-July inflow forecasts are 284,000 acre-feet (40% of average) and 1,100,000 acre-feet (150% of average), respectively.

Under the Most Probable forecast, the San Juan River Recovery Implementation Program (SJRIP) recommends a Spring Peak Release of 25 days for the spring of 2017.

Nearby Projects Update

The current Vallecito Reservoir storage is 88,922 acre-feet (71% full). Lemon Reservoir storage of 24,363 acre-feet (61% full). The Animas-La Plata Project's Lake Nighthorse storage is 111,759 acre-feet (97% full). Lake Nighthorse will likely be topped off next spring. McPhee Reservoir elevation storage is 326,577 acre-feet (86% full). Jackson Gulch storage is 5,971 acre-feet (60% full).

Special Presentation #1: River Channel Processes and Flow Conveyance

Tim Randle and David Varyu, Reclamation's Technical Service Center, Denver

Randle presented a discussion on flow conveyance specific to the San Juan River Basin. Rivers, especially in the San Juan River Basin, are dynamic, and change with time, especially during floods.

As sediment-heavy tributaries downstream of Navajo Reservoir bring sediment into the system, channel capacity diminishes. Ideally, annual releases from Navajo Reservoir will clear out the annual sediment accumulation, keeping the system in balance. However, several years without large releases, as occurs during droughts, can allow sediment to build up and vegetation to encroach, reducing the capacity of the channel and forcing the water surface higher.

The USGS gage at Archuleta was discussed. As at most natural channel gages, the stage and discharge do not show a linear relationship. The stage increase from 1,000 cfs to 1,500 cfs is just over half a foot. At higher flows, for example going from 4,000 cfs to 4,500 cfs, the stage will increase just over an inch. The stage and discharge were then compared on a single plot. From the beginning of the spring peak release in 2016 to the end of the spring peak release, the gage gained ½ foot of stage, most likely as a result of sediment scour.

A plot of flows at the USGS Archuleta gage was then shown for the 1950's to present. Prior to the dam construction, flows over 5,000 cfs were common. After the dam was built, peak flows rarely exceed 5,000 cfs. While annual peaks typically occurred during the spring runoff period, many large peaks occurred during the summer and fall, from rain events occurring downstream of Navajo Reservoir.

Photos of bank stabilization were shown and discussed. Banks without significant vegetation tend to erode much faster than banks with vegetation. Banks with willow trees tend to erode at a very slow rate. Aerial photos showing natural channel migration were shown. Sediment cohesiveness is very weak in the San Juan River Basin, and channel migration occurs naturally, especially during large events like the spring peak release, or flooding events.

In conclusion, the long-term maintenance of the channel capacity means that sediment loads from downstream tributaries be balanced with Navajo dam flow releases. Stream bank erosion and channel migration are natural processes. Rates of channel migration can be accelerated by woody vegetation removal. Structures built in the floodplain are subject to flood inundation, erosion, and sediment deposition, even from tributary floods.

Special Presentation #2: Channel Capacity Downstream of Navajo Dam

Ryan Gronewold and Curtis McFadden, US Army Corps of Engineers, Albuquerque

Navajo Reservoir is under the jurisdiction of the US Army Corps of Engineers in Albuquerque. Reclamation owns and operates the dam, and the USACE is responsible for Flood Control Operation according to Section 7 of the Flood Control Act of 1944. The USACE also established Channel Capacities and the Flood Control plan for the San Juan River downstream of the dam.

Prior to the dam construction, channel capacity of the San Juan River at Blanco (current Archuleta gage location) was 20,000 cfs. This is due to high natural pre-dam flows through this area. After the dam construction, the channel capacity was reduced. The maximum release at the dam is close to 5,000 cfs. By 1985, the channel capacity had been reduced to this level, 5,000 cfs, where it has remained.

Maintaining a 5,000 cfs channel capacity was discussed. As with all dams under their flood control jurisdiction, the USACE has a water control plan for Navajo Reservoir. The document serves to reduce the risk of an uncontrolled spill, during which well over 5,000 cfs could potentially be released in an uncontrolled manner. The current water control plan requires a 5,000 cfs release capability. Without this capability, the reservoir would need to be managed in a much more conservative way, keeping less water in storage at any time, to prevent uncontrolled spill or dam safety issues.

Agency/Organization Activities and Discussion of Related Activities

NAPI – Tentative gate closing is scheduled for October 17

NMISC – System Conservation Pilot Program was successful and will be conducted for another year. For more information contact Kristin Greene of the ISC: KristinN.Green@state.nm.us

NMOSE – Data uploads on the website are not working correctly at the moment. This issue is being addressed.

SJRIP – Data has been collected during and after the Spring Peak Release this year. Data collection is continuing and will be presented during the 2017 Annual Meeting.

Next Meeting - Scheduled for **1:00 p.m. on Tuesday, January 24, 2017** at the Civic Center in Farmington, New Mexico (200 West Arrington Street).

Attendance List – August 23, 2016 Navajo Operations Meeting

Ashcroft, Nick, West Hammond Domestic Water Users Assoc., Bloomfield NM
Austin, Steve, Navajo Nation EPA, Shiprock NM
Banks, Ben, City of Farmington, Farmington NM
Benally, Kristofferson, Navajo Agricultural Products Industry, O&M, Farmington NM
Carter, Robb, Navajo Lake State Park Marina, Arboles CO
Christianson, Ryan, Bureau of Reclamation, Grand Junction CO
Corwin, Linda, Bloomfield Irrigation District, Bloomfield NM
Day, Henry, Arizona Public Service, Phoenix AZ
Dodd, Stacy, Bloomfield Irrigation District, Bloomfield NM
Green, Kristine, NM Interstate Stream Commission, Santa Fe NM
Greene, Mike, PNM, Albuquerque NM
Gronewold, Ryan, US Army Corp of Engineers Albuquerque NM
Harry, Elden, Navajo Agricultural Products Industry, O&M, Farmington NM
Horner, Gary, Self, Farmington NM
Joe, Jeanette, Navajo Agricultural Products Industry, O&M, Farmington NM
Johnston, Clay, Turley Manzanaras Ditch Co., Blanco NM
Lane, Teresa, Hammond Conservancy District, Bloomfield NM
Lee, Keith, Lower Valley Water Users, Farmington NM
McFadden, Curtis, US Army Corp of Engineers Albuquerque NM
Miller, Gordon, San Juan Water Commission, Farmington NM
Miller, Marc, Bureau of Reclamation, Durango CO
Montoia, Paul A., City of Farmington NM
Muritz, Nic, Navajo State Park, Arboles CO
Munoz, Mark, NM State Engineers Office, Santa Fe NM
Novak Behery, Susan, Bureau of Reclamation, Durango CO
Prda, Sam, West Hammond Domestic Water Users, Bloomfield NM
Quintana, Chico, Bureau of Reclamation, Farmington NM
Richmond, Linda, Bureau of Land Management, Bluff UT
Sandy, Brian, CO Parks and Wildlife, Arboles, CO
Shockey, Jamie, City of Farmington, Farmington NM
Warner, Ed, Bureau of Reclamation, Grand Junction CO
Watson, Blaine, NM State Engineers Office, Aztec NM
Wethington, Marc, NM Department of Game and Fish, Navajo Dam NM
Whitmore, Sharon, US Fish and Wildlife, Albuquerque NM
Williams, Shawn, NM State Engineers Office, Aztec NM
Yazzie, Letisha, NM State Engineers Office, Aztec NM