

September 24-Month Study
Date: September 15th 2023

From: Water Resources Group, Salt Lake City
To: All Colorado River Annual Operating Plan (AOP) Recipients

Current Reservoir Status

	August Inflow (unregulated) (acre-feet)	% (percent)	Sept. 14 Midnight Elevation (feet)	Sept. 14, Midnight Reservoir Storage (acre-feet)
Fontenelle	73,900	114	6501.36	298,360
Flaming Gorge	95,200	133	6030.39	3,280,081
Blue Mesa	48,800	85	7501.17	667,932
Navajo	-3,500	-11	6049.77	1,168,446
Powell	307,100	82	3573.63	8,794,587

Expected Operations

The operation of Lake Powell and Lake Mead in the September 2023 24-Month Study is pursuant to the December 2007 Record of Decision on Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead (Interim Guidelines) and reflects the 2023 Annual Operating Plan (AOP). Pursuant to the Interim Guidelines, the August 2022 24-Month Study projections of the January 1, 2023, system storage and reservoir water surface elevations set the operational tier for the coordinated operation of Lake Powell and Lake Mead during 2023.

Consistent with Section 6.D.1 of the Interim Guidelines, Lake Powell's operation in water year (WY) 2023 is governed by the Lower Elevation Balancing Tier with an initial projected water year release volume of 7.00 million acre-feet (maf). Based on hydrologic conditions in April 2023, Reclamation determined that conditions were sufficient to release up to 9.50 maf from Lake Powell in WY 2023, consistent with Section 6.D.1 of the Interim Guidelines, but releases could be as low as 7.00 maf consistent with the Interim Guidelines and to protect Lake Powell from declining below elevation 3,525 feet at the end of December 2023. Balancing releases in WY 2023 are based on the projected end of water year physical contents of Lake Powell and Lake Mead. During the month of September 2023, Reclamation will monitor system conditions daily and adjust the monthly release volume as necessary to balance the contents of Lake Powell and Lake Mead as closely as practicable by the end of the water year.

Consistent with this operating approach and based on the most probable inflow forecast, the September 2023 24-Month Study projects a balancing release of 8.65 maf from Lake Powell in WY 2023. The projected release from Lake Powell in WY 2023 will be updated each month throughout the remainder of the water year. The modeling approach for 2024 and beyond will be consistent with the Interim Guidelines and will be based on the projected physical contents at Lake Powell and Lake Mead.

The 2022 Drought Response Operations Agreement (DROA) Plan¹ for May 2022 through April 2023 was amended to suspend 2022 DROA Plan releases as of March 7, 2023. A total DROA release of approximately 463 thousand acre-feet (kaf) occurred under the 2022 DROA Plan. Reclamation will attempt

to maximize DROA recovery in the Upper Initial Units in WY 2023 and through April 2024. Reclamation will provide monthly DROA accounting, including DROA releases and recovery, which can be found online at: <https://www.usbr.gov/dcp/DROSummarySheet.pdf>.

In May of 2023, the DROA Parties agreed to the 2023 DROA Plan. The 2023 DROA Plan does not include any DROA releases, but rather provides for recovery of prior DROA releases from the units upstream of Powell.

Reclamation will continue to carefully monitor hydrologic and operational conditions and assess the need for additional responsive actions and/or changes to operations. Reclamation will continue to consult with the Basin States, Basin Tribes, Mexico, and other partners on Colorado River operations to consider and determine whether additional measures should be taken to further enhance the preservation of these benefits, as well as recovery protocols, including those of future protective measures for both Lakes Powell and Mead.

Consistent with Section 2.D.1 of the Interim Guidelines, a Shortage Condition consistent with Section 2.D.1.b is governing the operation of Lake Mead for calendar year (CY) 2023. In addition, Section III.B of Exhibit 1 to the Lower Basin Drought Contingency Plan (DCP) Agreement will govern the operation of Lake Mead for CY 2023. Efforts to conserve additional water in Lake Mead under a 2021 Lower Basin Memorandum of Understanding (MOU) to facilitate near-term actions to maintain the water surface elevation of Lake Mead and additional conservation efforts under the Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program) will also take place in CY 2023.

The August 2023 24-Month study projected the January 1, 2024, Lake Powell elevation to be less than 3,575 feet and at or above 3,525 feet and the Lake Mead elevation to be at or above 1,025 feet. Consistent with Section 6.C.1 of the Interim Guidelines the operational tier for Lake Powell in WY 2024 will be the Mid-Elevation Release Tier and the water year release volume from Lake Powell will be 7.48 maf.

The August 2023 24-Month Study projected the January 1, 2024 Lake Mead elevation to be below 1,075 feet and above 1,050 feet. Consistent with Section 2.D.1 of the Interim Guidelines, a Shortage Condition consistent with Section 2.D.1.a will govern the operation of Lake Mead for CY 2024. In addition, Section III.B of Exhibit 1 to the Lower Basin DCP Agreement will also govern the operation of Lake Mead for CY 2024. Lower Basin projections for Lake Mead take into consideration updated water orders to reflect additional conservation efforts under the LC Conservation Program.

The 2024 operational tier determinations for Lake Powell and Lake Mead will be documented in the 2024 AOP, which is currently in development.

Current runoff projections into Lake Powell are provided by the National Weather Service's Colorado Basin River Forecast Center. The observed unregulated inflow into Lake Powell for the month of August was 0.307 maf or 82% of the 30-year average from 1991 to 2020. The September 2023 unregulated inflow forecast for Lake Powell is 0.40 maf or 116% of the 30-year average. The observed 2023 April through July unregulated inflow is 10.62 maf or 166% of average.

The draft 2024 AOP is available online at:

https://www.usbr.gov/lc/region/g4000/AOP2024/AOP24_draft.pdf

The 2023 AOP is available online at:

<https://www.usbr.gov/uc/water/rsvrs/ops/aop/AOP23.pdf>.

The Interim Guidelines are available online at:
<https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf>.

The Colorado River DCPs are available online at:
<https://www.usbr.gov/dcp/finaldocs.html>.

The 2021 Lower Basin MOU is available online at:
https://www.usbr.gov/lc/region/g4000/2021_MOU.pdf.

The Upper Basin DROA is online at:
<https://www.usbr.gov/dcp/droa.html>.

The Upper Basin Hydrology Summary is available online at:
https://www.usbr.gov/uc/water/crsp/studies/24Month_09_ucb.pdf.

Information on the LC Conservation Program is available online at:
<https://www.usbr.gov/lc/LCBConservation.html>.

Fontenelle Reservoir

As of September 04, 2023, the Fontenelle Reservoir pool elevation is 6502.17 feet, which amounts to 91 percent of live storage capacity. Inflows for the month of August totaled approximately 73,922 acre-feet (af) or 114 percent of average.

August inflow to Fontenelle was higher than initially forecasted. Runoff has been unpredictable due to unsettled weather in the region throughout summer. Release rates are currently holding at 1,200 cfs and will remain at 1,200 cfs longer than initial predictions. Pending hydrology, release rates may need to decrease to approximately 1,100 cfs at the end of September.

The September final forecast for unregulated inflows into Fontenelle for the next three months projects near average conditions. September, October, and November Most Probable inflow volumes amount to 45,000 af (113 percent of average), 50,000 af (111 percent of average), and 45,000 af (107 percent of average), respectively.

The next Fontenelle Working Group meeting is pending time and location. Details on the meeting will be provided as we get closer to the meeting date. Prior Fontenelle Working Group meeting minutes are available online on USBR's website at <https://www.usbr.gov/uc/water/crsp/wg/ft/ftcurrnt.html>. The Fontenelle Working Group is an open public forum for information exchange between Reclamation and other parties associated with the operation of Fontenelle Reservoir.

Flaming Gorge Reservoir

As of September 12, 2023 (end of day), Flaming Gorge Reservoir pool elevation is 6030.47 feet, which amounts to 89 percent of live storage capacity. Unregulated inflow volume for the month of August is approximately 95,000 af, which is 133 percent of the average August unregulated inflow volume. Current average daily releases are approximately 1,900 cfs. The Colorado pikeminnow experiment is being implemented and releases will be made, pending the Yampa flow, to achieve greater than 2,200 cfs in Reach 2, measured at the USGS Jensen gage.

The September unregulated inflows into Flaming Gorge for the next three months projects near average. September, October, and November forecasted unregulated inflow volumes amount to 55,000 af (119

percent of average), 60,000 af (113 percent of average), and 56,000 af (113 percent of average), respectively.

Per the Reclamation Flaming Gorge Record of Decision (ROD) and Final Environmental Impact Statement (FEIS), Reclamation will change the current month's hydrologic classification during the baseflow period. Adjustments to the current month's (September) hydrologic classification is based on observed unregulated inflow volume from the previous month (August). Flaming Gorge Dam operated under the moderately wet hydrologic classification in August; however, since the observed August 2023 unregulated inflow was 95,000 acre feet, a 39% exceedance value, the hydrologic classification for September 2023 will shift down 1 classification to average. An average hydrologic classification targets a flow range of 1,500-2,400 cfs in reach 2 of the Green River which is measured at the Jensen USGS streamgage (USGS Link). Flaming Gorge Dam releases and inflows downstream of the facility, especially from the Yampa River, will be used to meet the reach 2 flow target.

To achieve Reclamation's mission goals, and Flaming Gorge Operations Plan and ROD objectives, the September 2023 reach 2 flow target will remain at greater than 2,200 cfs due to the ongoing Colorado pikeminnow experiment, which is projected to conclude at the end of September. Concerning releases in October, it is anticipated to achieve near 2,200 cfs in Reach 2 (measured at Jensen, Utah). Average daily releases are anticipated to be near 1,700 cfs and this will depend on what the Yampa is providing. Hourly release schedules issued by WAPA for power production may include daily fluctuations to meet power demand contracts. This data is considered the most likely scenario given the current forecast, is general, and is subject to changing conditions.

Reclamation is planning to hold Flaming Gorge Working Group meetings tentatively on March 21, 2024 and April 17, 2024, at 10:00 am (and Teams virtual meeting). The location is TBD. The Flaming Gorge Working Group is an open public forum for information exchange between Reclamation and the stakeholders of Flaming Gorge Dam. The public is encouraged to attend and comment on the operations and plans presented by Reclamation at these meetings. Meeting notes from past Working Group meetings are posted on the Working Group webpage. For more information on this group and these meetings please contact Alex Pivarnik at (385) 475 – 8329.

Aspinall Unit Reservoirs

As of September 10, 2023, releases from Crystal Dam are approximately 1,750 cfs. Flows of the Gunnison River in the Black Canyon are being maintained at about 690 cfs while the Gunnison Tunnel is diverting 1,045 cfs. Flows in the Whitewater Reach of the Gunnison River are about 1,570 cfs.

The unregulated inflow volume in July to Blue Mesa was 48,800 af (86 percent of average). Unregulated Inflow volumes forecasted for Blue Mesa for the next three months (September, October and November) are projected to be: 39,000 af (111 percent of average), 38,000 af (103 percent of average) and 33,000 af (110 percent of average), respectively. The September 24-Month Study will be reflective of these new forecasted inflows.

The forecasted 2023 water year unregulated inflow volume to Blue Mesa is projected to be 890,000 af (98 percent of average). The water supply period (April-July) for 2024 had an unregulated inflow volume of to be 618,000 af of unregulated inflow (97 percent of average).

Blue Mesa elevation has increased dramatically between April and the end of June. On April 9, 2023 the elevation of Blue Mesa was 7444.46 feet above sea level and Blue Mesa was 36.3% full. On June 25, 2023, the elevation of Blue Mesa reached its peak for the year at 7512.47 feet above sea level and Blue Mesa storage reached 92.4% of full. By the end of water year 2023 (September 30, 2023) Blue Mesa elevation is projected to be approximately 7,495.39 feet above sea level with about 620,490 acre-feet of storage which will be 75 percent of capacity.

The Aspinall Unit Operations Group is an open public forum for information exchange between Reclamation and the stakeholders of the Aspinall Unit. The public is encouraged to attend and comments on the operations and plans presented by Reclamation at these meetings. Meeting notes from past working Group meetings are posted on the Operations Group webpage. For more information on this group and these meetings please contact Erik Knight in the Grand Junction Area Office at (970) 248-0629.

The next Operations Group meeting will be held January 21, 2024 at 1:00 p.m., in person at the Elk Creek Visitor Center at Blue Mesa Reservoir. This will be an in-person meeting with an option for remote participation. Contact Erik Knight in the Grand Junction Area Office at (970) 248-0629 to get more information regarding this Operation Group meeting.

Navajo Reservoir

On September 7th the daily average release rate from Navajo Dam was 800 cfs while reservoir inflow was averaging 157 cfs. The water surface elevation was 6050.88 feet above sea level. At this elevation the live storage is 1.18 maf (72 percent of live storage capacity) and the active storage is 554 maf (54 percent of active storage capacity). An average of 534 cfs is currently being diverted to Cutter Reservoir for the Navajo Indian Irrigation Project (NIIP). Due to streamflows below minimum bypass, 0 cfs is being diverted to the San Juan-Chama Project (SJC) above Navajo Reservoir. So far this calendar year, NIIP has diverted 177 kaf and SJC has diverted 144 kaf.

Releases from Navajo Dam are made for authorized purposes of the Navajo Unit and are pursuant to the Record of Decision for the Navajo Reservoir Operations. Releases target the San Juan River Recovery Implementation Program's (SJRIIP) recommended downstream baseflow range of 500 cfs to 1,000 cfs through the critical habitat reach of the San Juan River (Farmington, NM to Lake Powell).

Preliminary modified unregulated inflow (MUI) into Navajo in August was -3.1 kaf. When the MUI is negative, it indicates a large proportion of loss from upper reservoir releases downstream. Observed inflow to Navajo was 23 kaf. The release averaged 690 cfs and totaled 42.3 kaf, which was 87 percent of average for the month. The total April-July modified unregulated inflow into Navajo was 1,028 kaf (164 percent of average).

The most probable MUI forecast for September, October, and November, is 9 kaf (26% of average), 30 kaf (78% of average), and 31 kaf (116% of average), respectively.

Reclamation conducts Public Operations Meetings three times per year to gather input for determining upcoming operations for Navajo Reservoir. 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. The next meeting will be held on Tuesday, January 16th 2024 at 1:00 PM. This meeting is open to the public, and will be held at the Farmington Civic Center, 200 West Arrington, in Farmington, New Mexico (subject to change based on guidance at the time). The meeting will also have a virtual option.

Glen Canyon Dam / Lake Powell

Current Status

Consistent with Section 6.D.1 of the Interim Guidelines, Lake Powell's operation in WY 2023 is governed by the Lower Elevation Balancing Tier with an initial projected WY release volume of 7.00 maf. Based on hydrologic conditions as of April 2023, Reclamation determined that conditions were sufficient to release up to 9.50 maf from Lake Powell in WY 2023 consistent with Section 6.D.1 of the Interim Guidelines, but releases could be as low as 7.00 maf consistent with the Interim Guidelines and to protect Lake Powell from declining below elevation 3,525 feet at the end of December 2023. Balancing releases in WY 2023 are based on projected end of water year physical contents of Lake Powell and Lake Mead.

Consistent with this operating approach and based on the most probable inflow forecast, the September 2023 24-Month Study projects a balancing release of 8.66 maf from Lake Powell in WY 2023. The projected release from Lake Powell in WY 2023 will be updated each month throughout the remainder of the water year. The modeling approach for 2024 and beyond will be consistent with the Interim Guidelines and will be based on the projected physical contents at Lake Powell and Lake Mead.

Reclamation will continue to carefully monitor hydrologic and operational conditions and assess the need for additional responsive actions and/or changes to operations. Reclamation will continue to consult with the Basin States, Basin Tribes, Mexico, and other partners on Colorado River operations to consider and determine whether additional measures should be taken to further enhance the preservation of these benefits, as well as recovery protocols, including those of future protective measures for both Lakes Powell and Mead.

The unregulated inflow volume to Lake Powell during August was 307 kaf (82 percent of average). The release volume from Glen Canyon Dam in August was 902 kaf. The end of August elevation and storage of Lake Powell were 3,574.71 feet (125 feet from full pool) and 8.88 maf (38 percent of live capacity), respectively.

Current Operations

The August 2023 24-Month study projects the January 1, 2023, Lake Powell elevation to be less than 3,575 feet and at or above 3,525 feet and the Lake Mead elevation to be at or above 1,025 feet. Consistent with Section 6.C.1 of the Interim Guidelines the operational tier for Lake Powell in water year 2024 is the Mid-Elevation Release Tier and the water year release volume from Lake Powell is 7.48 maf.

Hourly releases will fluctuate from a low of approximately 6,000 cubic feet per second (cfs) during the early morning hours to a high of 8,000 cfs during the afternoon and evening hours from September 14, 2023, through September 20, 2023.

Beginning Thursday, September 21, 2023, hourly releases will fluctuate from a low of approximately 5,000 cubic feet per second (cfs) during the early morning hours to a high of 8,000 cfs during the afternoon and

evening hours. These releases are the lowest minimum allowable under the 2016 Long-Term Experimental Management Plan Record of Decision. The anticipated monthly release volume for September will be confirmed throughout September as Reclamation balances the contents between Lakes Powell and Mead by the end of water year 2023 as nearly as practicable, as required under the Lower Elevation Balancing Tier, Section 6.D.1. of the 2007 Interim Guidelines.

The anticipated monthly release volume for October is anticipated to be 480,000 acre-feet and will be confirmed toward the end of September.

In addition to daily scheduled fluctuations for power generation, the instantaneous releases from Glen Canyon Dam may also fluctuate to provide 40 megawatts (MW) of system regulation. These instantaneous release adjustments stabilize the electrical generation and transmission system and translate to a range of about 1,300 cfs above or below the hourly scheduled release rate. Under normal system conditions, fluctuations for regulation are typically short lived and generally balance out over the hour with minimal or no noticeable impacts on downstream river flow conditions.

Releases from Glen Canyon Dam can also fluctuate beyond scheduled releases when called upon to respond to unscheduled power outages or power system emergencies. Depending on the severity of the system emergency, the response from Glen Canyon Dam can be significant, within the full range of the operating capacity of the power plant for as long as is necessary to maintain balance in the transmission system. Glen Canyon Dam currently maintains 30 MW (approximately 1,300 cfs) of generation capacity in reserve in order to respond to a system emergency even when generation rates are already high. System emergencies occur infrequently and typically require small responses from Glen Canyon Dam. However, these responses can have a noticeable impact on the river downstream of Glen Canyon Dam.

Inflow Forecasts and Model Projections

The forecast for water year 2023 unregulated inflow to Lake Powell, issued on September 1, 2023, by the Colorado Basin River Forecast Center, projects that the most probable (median) unregulated inflow volume in water year 2023 will be 13.6 maf (142 percent of average).

In addition to the September 2023 24-Month Study based on the Most Probable inflow scenario, and in accordance with the Upper Basin Drought Response Operations Agreement (DROA), Reclamation has conducted model runs in September to determine a possible range of reservoir elevations. The September 2023 24-Month Study probable most and minimum and the August 2023 24-Month Study maximum probable inflow scenarios were used to determine the range of probable outcomes. The probable minimum and probable maximum model runs are conducted simultaneously in January, April, August, and October, or when necessary to incorporate changing conditions. The probable minimum inflow scenario reflects a dry hydrologic condition which statistically would be exceeded 90 percent of the time. The most probable inflow scenario reflects a median hydrologic condition which statistically would be exceeded 50 percent of the time. The probable maximum inflow scenario reflects a wet hydrologic condition which statistically would be exceeded 10 percent of the time. There is approximately an 80 percent probability that a future elevation will fall inside the range of the minimum and maximum inflow scenarios. Additionally, there are possible inflow scenarios that would result in reservoir elevations falling outside the ranges indicated in these reports.

The DROA coordination will continue until either (i) the minimum probable projected elevation remains above 3,525 feet for 24 months or (ii) the process moves to the next step when the most probable

projected elevation indicates Powell elevations below 3,525 feet and a Drought Response Operations Plan is developed. This current Plan is described above and available for review here: <https://www.usbr.gov/dcp/droa.html>.

The September forecast for water year 2023 is 13.60 maf (142 percent of average). The September forecast for WY 2024 ranges from a minimum probable of 6.30 maf (66% of average) to a forecasted August 24-Month Study maximum probable of 17.70 maf (184 percent of average) with the most probable forecast for water year 2024 of 10.00 maf (104 percent of average). There is a 10 percent chance that inflows could be higher than the current maximum probable forecast and a 10 percent chance that inflows could be lower than the minimum probable forecast.

Based on the current forecast for water year 2023 of 13.60 maf unregulated, the September 24-Month Study projects Lake Powell elevation will end water year 2023 near 3574.31 feet with approximately 8.85 maf in storage (38 percent of capacity). Based on the current forecast for water year 2024 of 10.00 maf unregulated, the September 24-Month Study projects Lake Powell elevation will end water year 2024 near 3597.15 feet with approximately 10.74 maf in storage (46 percent of capacity). Note that projections of elevation and storage for water year 2024 have significant uncertainty at this point in the season. Projections of end of water year 2024 elevation using the September minimum and August maximum inflow forecast results are 3,560.03 feet and 3,656.79 feet, respectively. The annual release volume from Lake Powell during water year 2024 is 7.48 maf under the Mid-Elevation Release Tier as determined under Section 6.C.1 of the Interim Guidelines as determined by the Department of the Interior as described above.

Upper Colorado River Basin Hydrology

Upper Colorado River Basin regularly experiences significant year to year hydrologic variability. The 30-year average was updated in October 2022 from 1981 through 2010 to 1991 through 2020. Shifting the period of record decreased the average unregulated inflow 1.20 maf. The period 2000-2022 is the lowest 23-year period since the closure of Glen Canyon Dam in 1963, with an average unregulated inflow of 8.29 maf, or 93 percent of the 30-year average (1991-2020). (For comparison, the 1991-2020 total water year average is 9.60 maf.) The unregulated inflow during the 2000-2022 period has ranged from a low of 2.64 maf (28 percent of average) in water year 2002 to a high of 15.97 maf (166 percent of average) in water year 2011. In water year 2021 unregulated inflow volume to Lake Powell was 3.50 maf (36 percent of average), the second driest year on record above 2002. Under the current most probable forecast, the total water year 2023 unregulated inflow to Lake Powell is projected to be 13.60 maf (142 percent of average).

At the beginning of water year 2023, total system storage in the Colorado River Basin was 19.54 maf (33 percent of 58.48 maf total system capacity). This is a decrease of 3.33 maf over the total storage at the beginning of water year 2022 when total system storage was 22.87 maf (39 percent of capacity). Since the beginning of water year 2000, total Colorado Basin storage has experienced year to year increases and decreases in response to wet and dry hydrology, ranging from a high of 94 percent of capacity at the beginning of 2000 to the now current level of 33 percent of capacity at the beginning of water year 2023. Based on current inflow forecasts, the current projected end of water year 2023 total Colorado Basin reservoir storage is approximately 25.34 maf (43.3 percent of total system capacity). The actual end of water year 2023 system storage may vary from this projection, primarily due to uncertainty regarding this season's runoff and reservoir inflow.