June 24-Month Study  
Date: June 15, 2022

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

Current Reservoir Status

<table>
<thead>
<tr>
<th></th>
<th>May Inflow (unregulated) (acre-feet)</th>
<th>Percent of Average (percent)</th>
<th>June 14, Midnight Elevation (feet)</th>
<th>June 14, Midnight Reservoir Storage (acre-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fontenelle</td>
<td>62,500</td>
<td>36</td>
<td>6,489.57</td>
<td>215,500</td>
</tr>
<tr>
<td>Flaming Gorge</td>
<td>88,400</td>
<td>36</td>
<td>6,015.01</td>
<td>2,744,400</td>
</tr>
<tr>
<td>Blue Mesa</td>
<td>176,800</td>
<td>88</td>
<td>7,461.09</td>
<td>373,900</td>
</tr>
<tr>
<td>Navajo</td>
<td>166,900</td>
<td>69</td>
<td>6,028.44</td>
<td>944,500</td>
</tr>
<tr>
<td>Powell</td>
<td>1,381,500</td>
<td>67</td>
<td>3,536.51</td>
<td>6,659,000</td>
</tr>
</tbody>
</table>

**Expected Operations**

The operation of Lake Powell and Lake Mead in this June 2022 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 2022 Annual Operating Plan (AOP). Pursuant to the Interim Guidelines, the August 2021 24-Month Study projections of the January 1, 2022, system storage and reservoir water surface elevations set the operational tier for the coordinated operation of Lake Powell and Lake Mead during 2022.

The August 2021 24-Month study projected the January 1, 2022, 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 2022 is the Mid-Elevation Release Tier.

The August 2021 24-Month Study projected the January 1, 2022 Lake Mead elevation to be at or below 1,075 feet and at or 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 calendar year (CY) 2022. In addition, Section III.B of Exhibit 1 to the Lower Basin Drought Contingency Plan (DCP) Agreement will also govern the operation of Lake Mead for CY 2022. 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 will also take place in CY 2022.

In light of the prolonged drought, low runoff conditions, and depleted storage at Lake Powell, the Department of the Interior implemented an action under Sections 6 and 7.D of the 2007 Interim Guidelines specifically reducing the Glen Canyon Dam annual releases to 7.00 maf in water year 2022.\(^1\)

This action was undertaken in conjunction with 2022 Drought Response Operations Plan\(^2\) actions which together are anticipated to add approximately one million additional acre-feet of storage to Lake Powell by April 2023. The Department of Interior and Reclamation will work to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of these actions are preserved.

The reduction of releases from Lake Powell from 7.48 maf to 7.00 maf in water year 2022 will result in a reduced release volume of 0.48 maf that normally would have been released from Glen Canyon Dam to Lake Mead as part of the 7.48 maf annual release volume, consistent with routine operations under the 2007 Interim Guidelines. The reduction of releases from Glen Canyon Dam in water year 2022 (resulting in increased storage in Lake Powell) will not affect future operating determinations and will be accounted for “as if” this volume of water had been delivered to Lake Mead. The August 2022 24-Month Study will similarly model Lakes Powell and Mead as if the 0.48 maf had been delivered to Lake Mead for operating tier/condition purposes both for the U.S. Lower Basin and for Mexico.

Using the approach described in the immediately preceding paragraph, the June 2022 24-Month Study projects the January 1, 2023, Lake Powell elevation to be less than 3,525 feet. Consistent with Section 6.D.1 of the Interim Guidelines, the operational tier for Lake Powell in water year 2023 is projected be the Lower Elevation Balancing Tier and the water year release volume from Lake Powell is projected to be 7.05 maf. Additionally, the June 2022 24-Month Study projects the January 1, 2023 Lake Mead elevation to be below 1,050 feet and above 1,045 feet. Consistent with Section 2.D.1 of the Interim Guidelines, a Shortage Condition consistent with Section 2.D.1.b is projected to govern the operation of Lake Mead for calendar year 2023. In addition, Section III.B of Exhibit 1 to the Lower Basin DCP Agreement is also projected to govern the operation of Lake Mead for calendar year 2023. Should the August 2022 24-Month Study determine that Glen Canyon Dam will operate in a balancing condition in water year 2023, Glen Canyon Dam operations will be implemented in a manner that preserves the benefits to Glen Canyon Dam facilities and operations in 2023.

Current runoff projections into Lake Powell are provided by the National Weather Service’s Colorado Basin River Forecast Center and are as follows. The observed unregulated inflow into Lake Powell for the month of May was 1.382 maf or 67 percent of the 30-year average from 1991 to 2020. The June unregulated inflow forecast for Lake Powell is 1.200 maf or 49 percent of the 30-year average. The 2022 April through July unregulated inflow forecast is 3.500 maf or 55 percent of average.

The 2022 AOP is available online at:
The Interim Guidelines are available online at:
The Colorado River DCPs are available online at:
The 2021 Lower Basin MOU is available online at:
https://www.usbr.gov/lc/region/g4000/2021_MOU.pdf.
The Upper Basin Drought Response Operations Agreement is online at:
The Upper Basin Hydrology Summary is available online at:
Fontenelle Reservoir
As of June 10, 2022, the Fontenelle Reservoir pool elevation is 6484.07 feet, which amounts to 56 percent of live storage capacity. Inflows for the month of May totaled approximately 63,000 acre-feet (af) or 36 percent of average. Fontenelle’s release is currently maintained at 1,200 cfs.

The June final forecast for unregulated inflows into Fontenelle for the next three months projects below average conditions. June, July, and August inflow volumes amount to 220,000 af (74 percent of average), 102,000 af (57 percent of average), and 45,000 af (59 percent of average), respectively. The April-July 2022 unregulated inflow is forecasted to be 435,000 af or 59 percent of average.

The next Fontenelle Working Group meeting is scheduled for August 23, 2022 at 10:00 am at Rock Springs, Wyoming (tentative). 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
As of June 10, 2022, Flaming Gorge Reservoir pool elevation is 6014.93 feet, which amounts to 75 percent of live storage capacity. Unregulated inflow volume for the month of May is approximately 88,000 af, which is 36 percent of the average May unregulated inflow volume. The current average daily release is 1,000 cfs.

Pursuant to the 2022 Plan, which was just approved by the Upper Division States, the Upper Colorado River Commission, and the Department of the Interior, an additional 500 thousand acre-feet (kaf) will be delivered from Flaming Gorge Reservoir over the next 12 months (May 2022 through April 2023) to Lake Powell. This volume will be added to the spring periods by increasing the Larval Trigger Study Plan (LTSP) releases to 8600 cfs for 7 days, a 3-day smallmouth bass flow spike (mid-late June, possibly earlier), as well as the summer-winter base flow period, increasing base flow average daily releases to about 1,700 cfs.

The smallmouth bass (SMB) flow spike will begin shortly after Green and Yampa River temperatures reach and begin to exceed 16 degrees C (about 60 deg F). Occurrence of 16 degree C water usually happens earlier in dry years and later in wet years. In 2021, a dry year, these conditions occurred in early June which was followed by a flow spike beginning on June 21. The SMB flow spike is anticipated to start on June 21, 2022.

The June forecast for unregulated inflows into Flaming Gorge for the next three months projects below average conditions. June, July, and August forecasted unregulated inflow volumes amount to 250,000 af (64 percent of average), 116,000 af (58 percent of average), and 50,000 af (70 percent of average), respectively.

The June water supply forecast of the April through July unregulated inflow volume into Flaming Gorge Reservoir is 520,000 af (54 percent of average), a moderately dry hydrologic classification.

Reclamation is planning to hold the next Flaming Gorge Working Group meeting on August 25, 2022 at 10:00 am MDT (tentative) in Vernal, Utah (tentative). 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 Dale Hamilton at 801-379-1186.

**Aspinall Unit Reservoirs**

As of June 9, 2022, releases from Crystal Dam are approximately 1,350 cfs. Gunnison Tunnel diversions are occurring and currently about 1,030 cfs. Flows of the Gunnison River in the Black Canyon are being maintained at about 320 cfs while flows in the Whitewater Reach of the Gunnison River are about 2,200 cfs.

The unregulated inflow volume in January to Blue Mesa was 176,837 af (87 percent of average). Unregulated Inflow volumes forecasted for Blue Mesa for the next three months (June, July and August) are projected to be: 136,000 af (54 percent of average), 55,000 af (51 percent of average) and 38,000 af (63 percent of average), respectively. The June 24-Month Study will be reflective of these new forecasted inflows.

The forecasted 2022 water year unregulated inflow volume to Blue Mesa is projected to be 637,200 af (70 percent of average based on period from 1991-2020). The water supply period (April-July) for 2022 is forecasted to be 429,600 af of unregulated inflow (68 percent of average).

Blue Mesa elevation is now increasing and as of June 9, 2022, was 7,459.01 feet above sea level corresponding to a live storage of 361,100 af which is 43.1 percent of capacity. Blue Mesa elevation will likely continue to increase till mid-July and is projected to peak out at about 7,464 feet. By the end of water year 2022 (September 30, 2022) Blue Mesa elevation is projected to be 7,447 feet with about 295,000 af of storage which will be 35 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 in August 2022. The meeting will be held in person. 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 June 9 the daily average release rate from Navajo Dam was 300 cfs while reservoir inflow was averaging 535 cfs. The water surface elevation was 6028.84 feet above sea level. At this elevation the live storage is 0.945 maf (58 percent of live storage capacity) and the active storage is 0.322 maf (31 percent of active storage capacity). The Navajo Indian Irrigation Project (NIIP) is diverting 660 cfs (totaling 74.6 kaf so far in CY2022). The San Juan-Chama project is diverting 121 cfs (totaling 52 kaf so far in CY2022) from the basin above Navajo Reservoir.

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 (SJRIP) 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). The release is increasing Monday, June 13th, to 500 cfs and will increase further throughout the month as the Animas
River falls. Releases will likely increase to 1200 cfs (or higher as needed) to maintain minimum baseflows this summer.

Preliminary modified unregulated inflow (MUI) into Navajo in May was 168 kaf, which was 69 percent of average for the month. The volume released downstream totaled 18.6 kaf, which was 18 percent of average for the month.

The most probable MUI forecast for June, July, and August is 20 kaf (11 percent of average), 0 kaf (0 percent of average), and 14 kaf (42 percent of average), respectively.

The April-July runoff forecasts are as follows:

Min Probable Forecast: 295,000 af (47 percent of average, a decrease of 15,000 af since the May forecast). So far, observed inflow accounts for 102 percent of this forecast. This forecast has already been exceeded.

Most Probable Forecast: 310,000 af (49 percent of average, a decrease of 70,000 af since the May forecast). So far, observed inflow accounts for 97 percent of this forecast.

Max Probable Forecast: 340,000 af (54 percent of average, a decrease of 140,000 af since the May forecast). So far, observed inflow accounts for 89 percent of this forecast.

Beginning October 1 of 2021 (the start of WY 2022), the area-capacity table for Navajo Reservoir was updated based on a 2019 Survey.

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, August 23 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. The meeting will also have a virtual option.

**Glen Canyon Dam / Lake Powell**

**Current Status**
The Bureau of Reclamation announced on May 3, 2022, two separate urgent drought response actions that will help prop up Lake Powell by nearly 1 million acre-feet (maf) of water over the next 12 months (May 2022 through April 2023). To protect Lake Powell, more water will flow into the lake from upstream reservoirs and less water will be released downstream:

- Under a Drought Contingency Plan adopted in 2019, approximately 500 thousand acre-feet (kaf) of water will come from Flaming Gorge Reservoir, located approximately 455 river miles upstream of Lake Powell.
- Another 480 kaf will be left in Lake Powell by reducing Glen Canyon Dam’s annual release volume from 7.48 maf to 7.0 maf, as outlined in the 2007 Interim Guidelines that control operations of Glen Canyon Dam and Hoover Dam.

The plan can be found at the following website: [https://www.usbr.gov/dcp/droa.html](https://www.usbr.gov/dcp/droa.html)
For additional information, see the following news release: https://www.usbr.gov/newsroom/#/news-release/4196

The Department of the Interior is conducting the fifth experimental flow at Glen Canyon Dam since implementing its Long-Term Experimental and Management Plan (LTEMP). The goal is to provide enhanced habitat for the lifecycle of aquatic insects that are the primary food source for fish in the Colorado River.

Experiments under LTEMP consist of four different flow regimes: high flows, macroinvertebrate flows (bug flows), trout management flows, and low summer flows. Collaborative discussions among technical experts resulted in a decision to begin this fourth consecutive year of the bug flow experiment on May 1 and continue through August 31, 2022. It will slightly modify the schedule and flow rates of water releases from Lake Powell through Glen Canyon Dam, Arizona. The normally scheduled monthly and weekly release volumes will not be affected.

Flows during the experiment will include steady weekend water releases with routine hydropower production flows on weekdays that include normal hourly changes in release rates. Those steady weekend flows are expected to provide favorable conditions for aquatic insects to lay and cement their eggs to rocks, vegetation, and other materials near the river’s edge. Steady weekend flows will be relatively low, within two inches of typical weekday low water levels. It is unlikely casual recreational river users will notice the changes in water levels. Hourly releases in May 2022 will fluctuate from a low of approximately 8,600 cfs during the early morning hours to a high of 13,990 cfs during the afternoon and evening hours. On weekend days in May 2022, releases will be steady near 9,350 cfs. The Glen Canyon Dam Implementation Team will closely monitor the condition of resources during the experiment and may terminate implementation at any time if unanticipated negative impacts are observed or are likely to occur due to ongoing drought and low lake levels.

Insects expected to benefit from this experiment are an important food source for many species of fish, birds, and bats in the canyon. Beyond expected resource benefits, this experiment will also provide scientific information that will be used in future decision making. Although every effort will be made to match the design of the experiment described above, Reclamation will continue to exercise the operational flexibility described in the LTEMP ROD. Additional information can be found on the Glen Canyon Dam Adaptive Management website here: https://www.usbr.gov/uc/progact/amp/ltemp.html

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>599</td>
<td>6,350</td>
<td>13,990</td>
<td>9,350</td>
</tr>
<tr>
<td>June</td>
<td>598</td>
<td>8,600</td>
<td>14,582</td>
<td>9,350</td>
</tr>
<tr>
<td>July</td>
<td>673</td>
<td>8,600</td>
<td>15,332</td>
<td>9,350</td>
</tr>
<tr>
<td>August</td>
<td>717</td>
<td>8,600</td>
<td>15,772</td>
<td>9,350</td>
</tr>
</tbody>
</table>

The unregulated inflow volume to Lake Powell during May was 1,381,500 thousand acre-feet (kaf) (67 percent of average). The release volume from Glen Canyon Dam in May was 598 kaf. The end of May elevation and storage of Lake Powell were 3,531.69 feet (168 feet from full pool) and 6.34 million acre-feet (maf) (26 percent of live capacity), respectively.
Current Operations
The operating tier for water year 2022 (October 2021 through September 2022) was established in August 2021 as the Mid-Elevation Release Tier consistent with Section 6.C.1 of the Interim Guidelines. The August 2021 24-Month study projected the January 1, 2022, 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.

As previously mentioned, in light of the prolonged drought, low runoff conditions, and depleted storage at Lake Powell, the Department of the Interior implemented an action under Sections 6 and 7.D of the 2007 Interim Guidelines specifically reducing the Glen Canyon Dam annual releases to 7.0 maf in water year 2022.

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 1,100 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 40 MW (approximately 800 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 2022 unregulated inflow to Lake Powell, issued on June 3, 2022, by the Colorado Basin River Forecast Center, projects that the most probable (median) unregulated inflow volume this year will be 5.61 maf (58 percent of average).

In addition to the June 2022 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 June to determine a possible range of reservoir elevations under probable most, maximum and minimum inflow scenarios. 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
The June forecast for water year 2022 ranges from a minimum probable of 5.04 maf (52 percent of average) to a maximum probable of 6.61 maf (69 percent of average) with the most probable forecast for water year 2022 of 5.61 maf (58 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 of 5.61 maf unregulated inflow for water year 2022, the June 24-Month Study projects Lake Powell elevation will end water year 2022 near 3525.79 feet with approximately 5.98 maf in storage (25 percent of capacity). Note that projections of elevation and storage for water year 2022 have significant uncertainty at this point in the season. Projections of end of water year 2022 elevation using the minimum and maximum inflow forecast results from the June 2022 model run are 3,521.64 feet and 3,534.05 feet, respectively. The annual release volume from Lake Powell during water year 2022 will be 7.0 maf as determined under Section 6.C.1 and 7.D of the Interim Guidelines as determined by the Department of the Interior.

**Upper Colorado River Basin Hydrology**

Upper Colorado River Basin regularly experiences significant year to year hydrologic variability. During the 22-year period 2000 to 2021, however, the unregulated inflow to Lake Powell, which is a good measure of hydrologic conditions in the Colorado River Basin, was above average in only 5 out of the past 22 years. The period 2000-2021 is the lowest 22-year period since the closure of Glen Canyon Dam in 1963, with an average unregulated inflow of 8.46 maf, or 88 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 2000-2021 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 2022 unregulated inflow to Lake Powell is projected to be 5.61 maf (58 percent of average).

At the beginning of water year 2022, total system storage in the Colorado River Basin was 22.80 maf (38 percent of 59.64 maf total system capacity). This is a decrease of 5.97 maf over the total storage at the beginning of water year 2021 when total system storage was 28.77 maf (48 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 38 percent of capacity at the beginning of water year 2022. Based on current inflow forecasts, the current projected end of water year 2022 total Colorado Basin reservoir storage is approximately 19.56 maf (33 percent of total system capacity). The actual end of water year 2022 system storage may vary from this projection, primarily due to uncertainty regarding this season’s runoff and reservoir inflow.