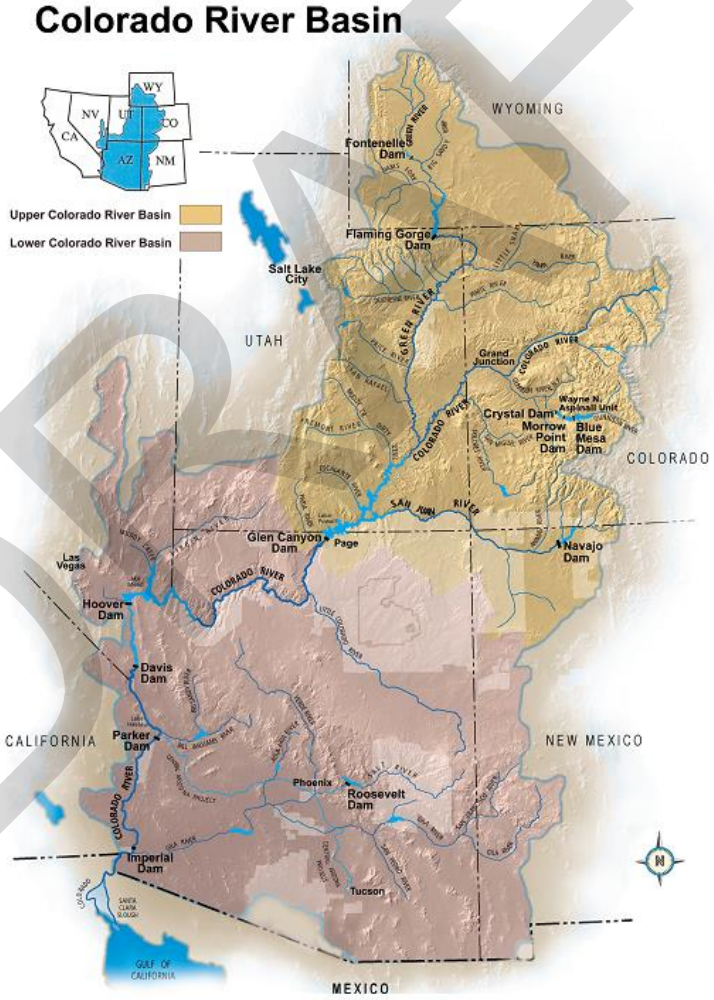
BUREAU OF RECLAMATION

DRAFT 2024 Annual Operating Plan for Colorado River Reservoirs



U.S. Department of the Interior

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INTRODUCTION

Background

Each year's Annual Operating Plan (AOP) for Colorado River Reservoirs reports both on the past operations of the Colorado River reservoirs for the completed year and projected operations and releases from these reservoirs for the current (i.e., upcoming) year. Accordingly, this 2024 AOP reports on 2023 operations as well as projected operations for 2024. In recent years, additions to the Law of the River such as operational rules, guidelines, and decisions have been put into place for Colorado River reservoirs including the 1996 Glen Canyon Dam Record of Decision[1] (ROD), the Operating Criteria for Glen Canyon Dam,[2] the 1999 Off-stream Storage of Colorado River Water Rule (43 Code of Federal Regulations [CFR] Part 414),[3] the 2001 Interim Surplus Guidelines[4] addressing operation of Hoover Dam, the 2006 Flaming Gorge Dam ROD,[5] the 2006 Navajo Dam ROD[6] to implement recommended flows for endangered fish, the 2007 Interim Guidelines for the operations of Lake Powell and Lake Mead,[7] the 2012 Aspinall ROD,[8] the 2016 Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) ROD,[9] Minutes No. 323 and 330 between the United States and Mexican Sections of the International Boundary and Water Commission (IBWC),[10,11] the agreements related to the 2019 Colorado River Drought Contingency Plans (DCPs)[12] as

[1] ROD for the Operation of Glen Canyon Dam, October 9, 1996. Available online at: https://www.usbr.gov/uc/envdocs/rod/Oct1996_OperationGCD_ROD.pdf.
[2] Following the implementation of the LTEMP ROD, the Glen Canyon Dam operating criteria were revised and available online at: https://www.usbr.gov/uc/water/crsp/studies/GCOC.pdf.
[3] Off-stream Storage of Colorado River Water; Development and Release of Intentionally Created Unused Apportionment in the Lower Division States: Final Rule (43 CFR Part 414; 64 *Federal Register* 59006, November 1, 1999). Available online at: https://www.usbr.gov/lc/region/g4000/contracts/FinalRule43cfr414.pdf.
[4] ROD for the Colorado River Interim Surplus Guidelines, January 16, 2001 (67 *Federal Register* 7772, January 25, 2001). Available online at: https://www.usbr.gov/lc/region/g4000/surplus/surplus_rod_final.pdf.
[5] ROD for the Operation of Flaming Gorge Dam, February 16, 2006. Available online at: https://www.usbr.gov/uc/envdocs/rod/fgFEIS/final-ROD-15feb06.pdf.
[6] ROD for Navajo Reservoir Operations, Navajo Unit – San Juan River, New Mexico, Colorado, Utah, July 31, 2006. Available online at: https://www.usbr.gov/uc/envdocs/eis/navajo/pdfs/NavWaterOpsROD2006.pdf.
[7] ROD for Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (73 *Federal Register* 19873, April 11, 2008). The ROD adopting the 2007 Interim Guidelines was signed by the Secretary on December 13, 2007. Available online at: https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf.
[8] ROD for the Aspinall Unit Operations, Final Environmental Impact Statement, April 2012. Available online at: https://www.usbr.gov/uc/envdocs/eis/AspinallEIS/ROD.pdf.
[9] ROD for the Glen Canyon Dam Long-Term Experimental and Management Plan Final Environmental Impact Statement, December 2016. Available online at: http://ltempeis.anl.gov/documents/docs/LTEMP_ROD.pdf.
[10] IBWC Minute No. 323, Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado River Basin dated September 21, 2017. Available online at: https://www.ibwc.gov/wp-content/uploads/2023/03/Min323.pdf.
[11] IBWC Minute No. 330, Expansion of Colorado River Temporary Measures dated March 21, 2024. Available online at: https://www.ibwc.gov/wp-content/uploads/2024/04/Minute-330-English-Spanish-Version-Signed-Clean.pdf.
[12] The agreements related to the 2019 Colorado River DCPs, as authorized by Public Law 116-14, were executed on May 20, 2019, and consist of an Upper Basin DCP (Drought Response Operations and Demand Management Storage) and a Lower Basin DCP including Lower Basin Drought Operations. Available online at: https://www.usbr.gov/dcp/finaldocs.html.

authorized by Public Law 116-14,[13] and the 2024 Supplemental Environmental Impact Statement (SEIS) for Near-term Colorado River Operations ROD (2024 Interim Guidelines SEIS ROD).[14] Each AOP incorporates these and other rules, guidelines, and decisions, and reports on how the criteria contained in the applicable decision document or documents are implemented. Thus, the AOP makes projections and reports on how the Bureau of Reclamation (Reclamation) will implement these decisions in response to changing water supply conditions as they unfold during the upcoming year, when conditions become known. Congress has charged the Secretary of the Interior (Secretary) with stewardship and responsibility for a wide range of natural, cultural, recreational, and tribal resources within the Colorado River Basin. The Secretary has the authority to operate and maintain Reclamation facilities within the Colorado River Basin addressed in this AOP to help manage these resources and accomplish their protection and enhancement in a manner fully consistent with applicable provisions of Federal law including the Law of the River, applicable provisions of State law, and other project-specific operational limitations.

The Secretary recognized in the 2007 Interim Guidelines that the AOP provides an integrated report on reservoir operations affected by numerous federal policies: *"The AOP is used to memorialize operational decisions that are made pursuant to individual federal actions (e.g., ISG* [the 2001 Interim Surplus Guidelines], *1996 Glen Canyon Dam ROD, this* [2007 Interim Guidelines] *ROD). Thus, the AOP serves as a single, integrated reference document required by section 602(b) of the CRBPA of 1968* [Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537)][15] *regarding past and anticipated operations."*

Authority

This 2024 AOP was developed in accordance with the processes set forth in: Section 602 of the CRBPA; the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537) (Operating Criteria), as amended, promulgated by the Secretary;[16] and Section 1804(c)(3) of the Grand Canyon Protection Act of 1992 (Public Law 102-575).[17]

Section 602(b) of the CRBPA requires the Secretary to prepare and *"transmit to the Congress and to the Governors of the Colorado River Basin States a report describing the actual operation under the adopted criteria* [i.e., the Operating Criteria] *for the preceding compact water year and the projected operation for the current year."*

This AOP has been developed consistent with: the Operating Criteria; applicable Federal laws; the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, the Treaty Between the United States of America and Mexico, signed February 3, 1944 (1944 United

[13] The Colorado River Drought Contingency Plan Authorization Act (Public Law 116-14) was signed into law on April 16, 2019. Available online at: https://www.congress.gov/116/bills/hr2030/BILLS-116hr2030enr.pdf.
[14] 2024 Interim Guidelines SEIS ROD is available online at: https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20240507-Near-termColoradoRiverOperations-SEIS-RecordofDecision-signed_508.pdf.
[15] Available online at: https://www.usbr.gov/lc/region/pao/pdfiles/crbproj.pdf.
[16] Available online at: https://www.usbr.gov/lc/region/g4000/lroc/frmar2905.pdf.
[17] Available online at: https://www.usbr.gov/uc/legal/gcpa1992.pdf.

States-Mexico Water Treaty);[18] interstate compacts; court decrees; the Colorado River Water Delivery Agreement;[19] the 2007 Interim Guidelines; the 2019 Colorado River DCP agreements; the 2024 Interim Guidelines SEIS ROD; and other documents relating to the use of the waters of the Colorado River, which are commonly and collectively known as the Law of the River.

The 2024 AOP was prepared by Reclamation on behalf of the Secretary, working with other Interior agencies and the Western Area Power Administration (WAPA). Reclamation consulted with the seven Colorado River Basin States Governors' representatives, representatives from Mexico, the Upper Colorado River Commission (UCRC), Native American tribes, other appropriate Federal agencies, representatives of academic and scientific communities, environmental organizations, representatives of the recreation industry, water delivery contractors, contractors for the purchase of Federal power, others interested in Colorado River operations, and the general public through the Colorado River Management Work Group.

Article I(2) of the Operating Criteria allows for revision of the projected plan of operation to reflect current hydrologic conditions with notification to the Congress and the Governors of the Colorado River Basin States of any changes by June of each year. The process for revision of the AOP is further described in Section 7.C of the 2007 Interim Guidelines. Any revision to the final AOP may occur only through the AOP consultation process as required by applicable Federal law.

Purpose

The purpose of the AOP is to report on the past year's operations and illustrate the potential range of reservoir operations that might be expected in the upcoming year, and to determine or address: (1) the quantity of water considered necessary to be in storage in the Upper Basin reservoirs as of September 30, 2024, pursuant to Section 602(a) of the CRBPA; (2) water available for delivery pursuant to the 1944 United States-Mexico Water Treaty and Minutes No. 242,[20] 323, 327,[21] and 330 of the IBWC; (3) whether the reasonable consumptive use requirements of mainstream users in the Lower Division States will be met under a "Normal," "Surplus," or "Shortage" Condition as outlined in Article III of the Operating Criteria and as implemented by the 2007 Interim Guidelines; (4) whether management and/or operational regimes will be required or considered as described in the 2019 Colorado River DCPs; (5) whether management and/or operations will be required or considered as described in the 2024 Interim Guidelines SEIS ROD; and (6) whether water apportioned to, but unused by one or more Lower Division States, exists and can be used to satisfy beneficial consumptive use requests of mainstream users in other Lower Division States as provided in the Consolidated

[18] Available online at: https://www.ibwc.gov/wp-content/uploads/2022/11/1944Treaty.pdf.
[19] Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement for Purposes of Section 5(B) of Interim Surplus Guidelines, October 10, 2003 (69 *Federal Register* 12202, March 15, 2004). Available online at: https://www.usbr.gov/lc/region/g4000/crwda/crwda.pdf.
[20] IBWC Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River dated August 30, 1973. Available online at: https://www.ibwc.gov/wp-content/uploads/2023/05/Min242.pdf.
[21] IBWC Minute No. 327, Emergency Deliveries of Colorado River Waters for use in the city of Tijuana, Baja California dated January 28, 2022. Available online at: https://www.ibwc.gov/wp-content/uploads/2022/11/Min327.pdf.

Decree of the Supreme Court of the United States in *Arizona v. California*, 547 U.S. 150 (2006) (Consolidated Decree).[22]

Consistent with the above determinations and in accordance with other applicable provisions of the Law of the River, the AOP was developed with "appropriate consideration of the uses of the reservoirs for all purposes, including flood control, river regulation, beneficial consumptive uses, power production, water quality control, recreation, enhancement of fish and wildlife, and other environmental factors" (Operating Criteria, Article I(2)).

Since the hydrologic conditions of the Colorado River Basin can never be completely known in advance, the AOP presents projected operations resulting from three different hydrologic scenarios: the minimum probable, most probable, and maximum probable reservoir inflow conditions. Projected reservoir operations are modified during the water year as runoff forecasts are adjusted to reflect existing snowpack, basin storage, flow conditions, and as changes occur in projected water deliveries.

Summary of Projected 2024 Operations

Upper Basin. Taking into account (1) the existing water storage conditions in the basin, (2) the August 2023 24-Month Study[23] projection of the most probable near-term water supply conditions in the basin, and (3) Section 6.C.1 of the 2007 Interim Guidelines, the Mid-Elevation Release Tier will govern the operation of Lake Powell for water year 2024. The August 2023 24-Month Study of the most probable inflow scenario projects the water year 2024 release from Glen Canyon Dam to be 7.48 million acre-feet (maf) (9,230 million cubic meters [mcm]). In addition, Section 6.E of the 2007 Interim Guidelines as amended in the 2024 Interim Guidelines SEIS ROD may also govern the operation of Lake Powell for water year 2024.

Reclamation will continue to monitor hydrologic and operational conditions and assess the need for additional responsive actions and changes to operations. Reclamation will continue to consult with the Basin States, Basin Tribes, the Republic of Mexico, and other partners on Colorado River operations to consider future protective measures for both Lake Powell and Lake Mead.

For further information about the variability of projected inflow into Lake Powell, see the 2024 Water Supply Assumptions section and the Lake Powell section within the Summary of Reservoir Operations in 2023 and Projected 2024 Reservoir Operations, and Tables 3 and 4.

Lower Basin. Taking into account (1) the existing water storage conditions in the basin, (2) the most probable near-term water supply conditions in the basin, and (3) Section 2.D.1 of the 2007 Interim Guidelines, a Shortage Condition, consistent with Section 2.D.1.a, will govern the operation of Lake Mead for calendar year 2024 in accordance with Article III(3)(c) of the

[22] Available online at: https://www.usbr.gov/lc/region/pao/pdfiles/scconsolidateddecree2006.pdf.
[23] The 24-Month Study refers to the operational study conducted by Reclamation to project future reservoir operations. The most recent 24-Month Study report is available on Reclamation's Water Operations websites and is updated each month. Available online at: https://www.usbr.gov/uc/water/crsp/studies/index.html and https://www.usbr.gov/lc/region/g4000/24mo/index.html.

Operating Criteria and Article II(B)(3) of the Consolidated Decree. In addition, the Lower Basin Drought Contingency Plan Agreement (LB DCP Agreement) will also govern the operation of Lake Mead for calendar year 2024. Consistent with Sections III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP Agreement, DCP contributions will be required by Arizona and Nevada, respectively, in calendar year 2024. Creation and/or delivery of Intentionally Created Surplus (ICS) may be made consistent with Section 3 of the 2007 Interim Guidelines and Sections III and IV of Exhibit 1 to the LB DCP Agreement, as applicable. In calendar year 2024, reservoir protection conservation will be implemented consistent with Section 2.E of the 2007 Interim Guidelines as amended in the 2024 Interim Guidelines SEIS ROD.

No unused apportionment for calendar year 2024 is anticipated. If any unused apportionment becomes available after adoption of this AOP, Reclamation, on behalf of the Secretary, may allocate any such available unused apportionment for calendar year 2024. Any such allocation shall be made in accordance with Article II(B)(6) of the Consolidated Decree, the Lower Colorado Region Policy for Apportioned but Unused Water (Unused Water Policy),[24] and giving further consideration to the water conservation objectives of the July 30, 2014 agreement for a pilot system conservation program (PSCP),[25] the Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program),[26] and as specified in Section 4.b of the LB DCP Agreement.

In calendar year 2024, Colorado River water may be stored off-stream pursuant to individual Storage and Interstate Release Agreements (SIRAs) and 43 CFR Part 414 within the Lower Division States. The Secretary shall make Intentionally Created Unused Apportionment (ICUA) available to contractors in Arizona, California, or Nevada pursuant to individual SIRAs and 43 CFR Part 414.

The Inadvertent Overrun and Payback Policy (IOPP),[27] which became effective January 1, 2004, will not be in effect during calendar year 2024 because overruns are not permitted in a Shortage Condition. In accordance with Section 2.6.e of the IOPP, further accumulation of inadvertent overruns in calendar year 2024 will be suspended.

Conserved Colorado River water, created through the PSCP,[28] the LB DCP Agreement, the LC Conservation Program, and other voluntary agreements, is anticipated to be added to Lower Basin reservoirs pursuant to system conservation agreements in the Lower Basin in calendar year 2024.

The 2007 Interim Guidelines adopted the ICS mechanism, which was expanded upon in the LB

[24] Lower Colorado Region Policy for Apportioned but Unused Water, February 11, 2010. Available online at: https://www.usbr.gov/lc/region/g4000/UnusedWaterPolicy.pdf.
[25] Available online at: https://www.usbr.gov/lc/region/programs/PilotSysConsProg/PilotSCPFundingAgreement7-30-2014.pdf.
[26] More information on the LC Conservation Program: https://www.usbr.gov/lc/LCBConservation.html.
[27] ROD for Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions, Final Environmental Impact Statement, October 10, 2003 (69 *Federal Register* 12202, March 15, 2004). Available online at: https://www.usbr.gov/lc/region/g4000/crwda/crwda_rod.pdf.
[28] More information about the PSCP in the Lower Basin can be found at: https://www.usbr.gov/lc/region/programs/PilotSysConsProg/pilotsystem.html.

DCP Agreement, that among other things encourages the efficient use and management of Colorado River water in the Lower Basin. ICS may be created and delivered in calendar year 2024 pursuant to the 2007 Interim Guidelines, the LB DCP Agreement, and applicable forbearance and delivery agreements, and consistent with approved ICS plans of creation.

Consistent with Section 4 of the 2007 Interim Guidelines, Developed Shortage Supply (DSS) may be created and delivered in calendar year 2024.

1944 United States-Mexico Water Treaty. A volume of 1.450 maf (1,790 mcm) of water will be available to be scheduled for delivery to Mexico during calendar year 2024 in accordance with Article 15 of the 1944 United States-Mexico Water Treaty, IBWC Minutes No. 242 and 327, and Section III.A of IBWC Minute No. 323. The volume delivered may also be adjusted for water savings contributions as required under Section IV of IBWC Minute No. 323 and system water and Mexico's Water Reserve conservation as required under Resolutions 1 and 2 of IBWC Minute No. 330. In accordance with IBWC Minute No. 323, Mexico may create water for or take delivery of water from Mexico's Water Reserve pursuant to Section III.C and Section V of IBWC Minute No. 323 and Resolution 3 of IBWC Minute No. 330.

BASINWIDE DROUGHT RESPONSE OPERATIONS

The Colorado River Basin is experiencing a prolonged period of drought and record-low runoff conditions resulting in historically low reservoir levels at Lake Powell and Lake Mead. The period from 2000 through 2022 is the lowest 23-year inflow in the historic record and one of the lowest in the past 1,200 years.[29] As a result of the exceptionally low runoff conditions over the past three years (2020, 2021, and 2022), drought response operations have been triggered at Lake Powell and Lake Mead consistent with the 2007 Interim Guidelines, Minutes No. 323 and 330, the 2019 Colorado River DCP agreements, and the 2024 Interim Guidelines SEIS ROD.

Upper Basin Drought Response Operations Agreement (DROA)

Reclamation staff have worked with the DROA[30] Parties to develop and implement the DROA Plans which include two components, (1) a Framework document, which will remain relatively static from year to year and contains provisions the DROA Parties will use to develop annual plans, and (2), attachments which are updated yearly that identify specific operations for each Initial Unit during the DROA operational year. A DROA year spans from May 1st through April 30th.

In July of 2021, Reclamation initiated an emergency release in accordance with the DROA after advance consultation and coordination with the Upper Division States, through the UCRC, and following consultation with and supporting communication from the Governors' Representatives of the Colorado River Basin States. Additional consultation occurred with

[29] Study on the tree-ring reconstruction record for the Upper Colorado River Basin is available online at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2007GL029988.

[30] Available online at: https://www.usbr.gov/dcp/docs/final/Attachment-A1-Drought-Response%20Operations-Agreement-Final.pdf.

WAPA,[31] the National Park Service, and the U.S. Fish and Wildlife Service (USFWS). Under the Emergency Action provision, Reclamation planned to release an additional total of 0.181 maf (223 mcm) in calendar year 2021, from Flaming Gorge, Blue Mesa, and Navajo reservoirs. Reclamation later modified that plan to release 0.161 maf (199 mcm), based on increased risk of not fully meeting contract deliveries from Navajo Reservoir in water year 2022.

In January of 2022, Reclamation initiated a second DROA action after advanced consultation and coordination with the Upper Division States, through the UCRC, and following consultation with the Governors' Representatives of the Colorado River Basin States. Pursuant to DROA, the first drought response that is considered is the modification of monthly release volumes from Lake Powell while maintaining the annual release volume pursuant to the 2007 Interim Guidelines. Reclamation modified Lake Powell release volumes by reducing the monthly releases from January through April 2022, by a total volume of 0.350 maf (432 mcm). This volume was scheduled to be added back into releases scheduled for June through September 2022; however, in May 2022, the Department of the Interior modified the annual release volume from Lake Powell from 7.48 maf (9,230 mcm) to 7.00 maf (8,630 mcm), in accordance with Sections 6 and 7.D of the 2007 Interim Guidelines.

2022 DROA Plan

In April of 2022, the DROA parties finalized the 2022 Plan for DROA year 2022, which spans May 2022 through April 2023.[32] The Secretary of the Interior through her designee approved the 2022 Plan on April 29, 2022.[33] The 2022 DROA Plan summarized below included the following key operational elements:

1. Drought Response Operations releases of approximately 0.500 maf (617 mcm) from Flaming Gorge Dam

2. Possible Drought Response Operations releases from Blue Mesa Reservoir in Fall 2022 and Winter 2023, contingent upon available release volumes

3. Possible Drought Response Operations releases from Navajo Reservoir in Fall 2022 or Winter 2023, contingent upon available release volume

4. Possible operational adjustments at Glen Canyon Dam in Winter 2023

5. No anticipated recovery of DROA release volumes through the term of the 2022 Plan

Based upon the November 2022 24-Month Study, Powell elevations under the minimum, maximum and most probable scenarios were expected to decrease below the target elevation of

[31] Per Interagency Agreement No. 19-WC-40-746, section 2.5, "Reclamation will ensure WAPA is given a meaningful opportunity to participate," including the opportunity to participate in the potential development of a drought response operations plan.
[32] Drought Response Operations Framework and Plan: https://www.usbr.gov/uc/DocLibrary/Plans/20220420-2022DroughtResponseOperationsPlan-Signed-508-UCRO.pdf.
[33] Department of Interior Approval Memo: https://www.usbr.gov/uc/DocLibrary/Plans/20220429-2022DroughtResponseOperationsPlan-ApprovalMemo-508-DOI.pdf.

3,525.00 feet (1,074.42 meters) beginning in March and April 2023, with the probabilistic range reaching levels 0.50 feet (0.15 meters) above minimum power pool 3,490.00 feet (1,063.75 meters) before rebounding above the target elevation in May 2023. Accordingly, Reclamation adjusted monthly release volume patterns for Glen Canyon Dam under the 2022 Plan to hold back a total of 0.523 maf (645 mcm) in Lake Powell from December 2022 through April 2023. The 0.523 maf (645 mcm) was subsequently released from Glen Canyon Dam in May through September of 2023.

Due to the improved hydrologic conditions in the Colorado River Basin, DROA releases from Flaming Gorge were suspended on March 6, 2023. At the time of the suspension, the total 2022 DROA release from Flaming Gorge was 0.463 maf (571 mcm) of the planned 0.500 maf (617 mcm). On March 16, 2023, Reclamation reduced releases from Flaming Gorge even further to initiate recovery of previous DROA releases. Reclamation continued recovery operations at Flaming Gorge through the end of DROA year 2022 and was able to successfully recover 0.135 maf (167 mcm) of DROA releases in March and April of 2023.[34]

2022 Powell Release Reduction; Operational Neutrality and Protection of the Glen Canyon Dam Facilities and Operations

In light of the prolonged drought, low runoff conditions, and depleted storage at Lake Powell, the Department of the Interior, in consultation with the Basin States and others, implemented an action under Sections 6 and 7.D of the 2007 Interim Guidelines specifically reducing the Glen Canyon Dam annual release from 7.48 maf (9,230 mcm) to 7.00 maf (8,630 mcm) in water year 2022 to protect critical infrastructure at Glen Canyon Dam. This action, based on the May 3rd Letter, was undertaken in consultation with the Basin States and Basin Tribes. The separate but related 2022 DROA actions resulted in adding approximately one million additional acre-feet (1,230 mcm) of storage, or 16.00 feet (4.88 meters) of pool elevation, by April 2023 in Lake Powell.

Beginning with the April 2023 24-Month Study, Reclamation removed the operational neutrality, as defined in the May 2022 letter, of the 0.480 maf (592 mcm) that was retained in Lake Powell under the May 2022 action,[35] such that balancing releases are based on the physical storages of Lake Powell and Lake Mead, but could be as low as 7.00 maf (8,630 mcm) and as high as 9.50 maf (11,720 mcm) consistent with the Interim Guidelines and to protect Lake Powell from declining below elevation 3,525.00 feet (1,074.42 meters) at the end of December 2023.

2023 DROA Plan

On May 26, 2023, the DROA Parties, including Reclamation, agreed to the 2023 Plan. The 2023 Plan reflects the impact of much above average Colorado River inflows in water year 2023 and does not include any DROA releases, but rather provides for recovery of prior DROA

[34] For more information regarding DROA accounting, which includes updates to monthly release and recovery volumes, visit the summary available online at: https://www.usbr.gov/ColoradoRiverBasin/documents/dcp/DROA/DROSummarySheet.pdf.
[35] For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf.

releases from the units upstream of Powell.[36] The Secretary of the Interior through her designee approved the 2023 Plan, as summarized in the following key operational elements:

- Anticipate full recovery of DROA release volumes at Flaming Gorge and Blue Mesa through the term of the 2023 Plan.[34]
- No additional action is anticipated during the 2023 Plan; the DROA Parties will continue to monitor hydrological conditions and, if needed, will make adjustments at Glen Canyon Dam, and then the upstream initial units (Flaming Gorge, Aspinall, and Navajo).

Recovery of Blue Mesa and Flaming Gorge was completed on December 29, 2023, and February 28, 2024, respectively. Accounting and recovery of DROA releases from Flaming Gorge and Blue Mesa were completed pursuant to Section 6 of the 2023 Plan.[36]

2024 Interim Guidelines SEIS

As directed by the Secretary, on November 17, 2022, Reclamation published a Federal Register Notice indicating its intent to prepare a SEIS.[37] The purpose of the SEIS is to supplement the Environmental Impact Statement completed in 2007 for the 2007 Interim Guidelines in order to modify operating guidelines for the operation of Glen Canyon and Hoover Dam to address the historic drought and low runoff conditions in the Colorado River Basin through 2026. The need for the revised operating guidelines is based on the potential that continued low runoff conditions in the Colorado River Basin could lead to critically low reservoir conditions at Lake Powell and Lake Mead that impact both water delivery and hydropower operations from 2023 through 2026.

Reclamation published the draft SEIS on April 14, 2023. The 45-day public commenting period was scheduled to end on May 30, 2023; however, an additional action alternative was submitted to Reclamation for consideration prior to the closing date by the Lower Division States.[38] With the submission of this proposed alternative, Reclamation withdrew the draft SEIS on May 22, 2023. On October 27, 2023, Reclamation published a revised draft SEIS which included an analysis of the effects of the proposal under the National Environmental Policy Act (NEPA). Reclamation continued with the NEPA process and the 45-day public comment period for the revised draft SEIS closed on December 11, 2023.[39, 40] On March 8, 2024, Reclamation released the final SEIS,[41] which included a 30-day comment period which closed on April 5, 2024. The 2024 Interim Guidelines SEIS ROD, which includes

[36] The 2023 DROA Plan is available online at: https://www.usbr.gov/ColoradoRiverBasin/dcp/droa.html.
[37] Federal Register Notice available online at: https://www.federalregister.gov/documents/2022/11/17/2022-25004/notice-of-intent-to-prepare-a-supplemental-environmental-impact-statement-for-december-2007-record.
[38] Information regarding the SEIS is available online at: https://www.usbr.gov/ColoradoRiverBasin/interimguidelines/seis/index.html.
[39] Federal Register Notice of availability online at: https://www.federalregister.gov/documents/2023/10/27/2023-23759/environmental-impact-statements-notice-of-availability.
[40] The revised draft SEIS is available online via the following link: https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20231019-Near-termColoradoRiverOperations-RevisedDraftEIS-508.pdf.
[41] The final SEIS is available online at: https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20240300-Near-termColoradoRiverOperations-FinalSEIS-508.pdf.

modifications to Sections 2, 6, and 7 of the 2007 Interim Guidelines, was published on May 9, 2024.

Additional conserved water in accordance with Section 2.E of the 2007 Interim Guidelines as amended by the 2024 Interim Guidelines SEIS ROD will be accounted for in the Colorado River Accounting and Water Use Report: Arizona, California, and Nevada (Water Accounting Report).[42]

System Conservation

System conservation agreements have allowed water users to participate in projects designed to determine whether voluntary, temporary, and compensated programs to conserve or reduce consumptive use of Colorado River water can benefit the entire Colorado River system by mitigating the effect on declining storage levels in Colorado River reservoirs.[43,44] Agreements previously executed under the PSCP in the Lower Basin continue to be implemented in 2024.[45]

Consistent with the Secretary's efforts to create or conserve 0.100 maf (123 mcm) or more of Colorado River system water annually in the Lower Basin under the LB DCP Agreement and the additional conservation goals under the 500 Plus Plan MOU, Reclamation and the MOU parties have entered into agreements to create system conservation water consistent with these two agreements. As of June 2023, efforts under the 500 Plus Plan have concluded. The conservation efforts in calendar year 2023 were superseded by the reservoir protection conservation efforts of the 2024 Interim Guidelines SEIS ROD and LC Conservation Program.

UC Conservation Program

In December 2022, Congress authorized the System Conservation Pilot Program (SCPP) in the Upper Division States.[43] Reclamation executed a SCPP funding agreement with the Upper Division States acting through the UCRC in January 2023. The UCRC executed 64 SCPP implementation agreements in Utah, Wyoming, Colorado, and New Mexico for 2023. The UCRC estimates approximately 38,000 acre-feet (47 mcm) of system water was conserved in 2023. The Upper Division States acting through the UCRC are implementing an additional SCPP effort in 2024 in partnership with Reclamation.

[42] Available online at: https://www.usbr.gov/lc/region/g4000/wtracct.html.
[43] Public Law 117-328 extended the System Conservation Pilot Program in the Upper Colorado River Basin through September 2024. UCRC is the contracting entity for the program and has entered into agreements for the 2023 season. More information is available online at: http://www.ucrcommission.com/ucrc-provides-scpp-status-update/.
[44] Pursuant to Public Law 113-235, a report from the Secretary evaluating the effectiveness of the water conservation pilot projects was submitted to Congress, including a recommendation that the activities undertaken by the pilot projects should be continued. More information is available online at: https://www.usbr.gov/lc/region/programs/PilotSysConsProg/report_to_congressW_appendices2021.pdf.
[45] More information on the PSCP in the Lower Basin can be found online at: https://www.usbr.gov/lc/region/programs/PilotSysConsProg/pilotsystem.html.

LC Conservation Program

Reclamation has continued its efforts to address the drought crisis with prompt and responsive actions and investments to ensure the entire Colorado River Basin can function and support all who rely on it. The LC Conservation Program[46] is intended to provide new opportunities for system conservation in the Lower Colorado River Basin that also lead to additional conservation and bridge the immediate need while moving toward improved system efficiency and more durable long-term solutions for the System. The LC Conservation Program has three components:

> 1.a. Proposals for system conservation resulting in additional volumes of water remaining in Lake Mead at set prices depending on the length of the commitment (one to three years).
>
> 1.b. Proposals describing lower Colorado River Basin water conservation plans that can be implemented resulting in reductions in consumptive use of lower Colorado River water having a recent history of use.
>
> 2. Proposals for long-term system efficiency improvements that will result in multi-year system conservation.

The funding opportunity announcement for components 1.a and 1.b was open for proposal submissions from October 12, 2022 through November 21, 2022. The funding opportunity announcement for component 2 was open for proposal submissions from May 24, 2023, through August 18, 2023. A summary table of executed agreements is available on the LC Conservation Program website.[47]

Additional projects or agreements to create or conserve system water in the Lower Basin may also be implemented in calendar year 2024.

System conservation under the LC Conservation Program will be incorporated into the reservoir protection conservation efforts under Section 2.E of the 2007 Interim Guidelines as amended by the 2024 Interim Guidelines SEIS ROD.

[46] More information on the LC Conservation Program can be found online at: https://www.usbr.gov/lc/LCBConservation.html.
[47] Draft summary table of executed agreements is available online at: https://www.usbr.gov/lc/region/programs/LCBConservation&EfficiencyProgram/SystemConservationAgreements.pdf.

2023 HYDROLOGY SUMMARY AND RESERVOIR STATUS

Much above average streamflow[48] was observed throughout much of the Colorado River Basin during water year 2023. Unregulated[49] inflow to Lake Powell in water year 2023 was 13.42 maf (16,550 mcm), or 140 percent of the 30-year average[50] which is 9.60 maf (11,840 mcm). Unregulated inflow to Flaming Gorge, Blue Mesa, and Navajo Reservoirs was 131, 117, and 134 percent of average, respectively.

Precipitation in the Upper Colorado River Basin was above average[51] during water year 2023. On September 30, 2023, the cumulative precipitation received within the Upper Colorado River Basin for water year 2023 was 114 percent of median.

Snowpack conditions trended much above average across most of the Colorado River Basin throughout the 2022-2023 snow accumulation season. The basin wide snow water equivalent measured 161 percent of the median peak on April 7, 2023, which is around one day later than the peak seasonal accumulation day of April 6. On April 1, 2023, the snow water equivalents for the Green River, Upper Colorado River Headwaters, and San Juan River Basins were 125, 122, and 174 percent of median, respectively.

During the 2023 spring runoff period, inflows to Lake Powell peaked on May 30, 2023 at approximately 148,900 cubic feet per second (cfs) (4,210 cubic meters per second [cms]). The April through July unregulated inflow volume for Lake Powell was 10.62 maf (13,100 mcm) which was 166 percent of average.[52]

Lower Basin tributary inflows above Lake Mead were much above average for water year 2023. Tributary inflow measured at the Little Colorado River near Cameron gage for water year 2023 totaled 0.237 maf (292 mcm), or 200 percent of average. Tributary inflow measured at the Virgin River at Littlefield gage for water year 2023 totaled 0.281 maf (347 mcm), or 163 percent of average.

[48] Streamflow statistics throughout this document are provided by the National Weather Service's Colorado Basin River Forecast Center (CBRFC) and are based on the average/median for the 30-year period 1991-2020, unless otherwise noted. Hydrologic conditions are described in the following manner: much above average/median (greater than 130%), above average/median (111%-130%), near average/median (90%-110%), below average/median (70%-89%), and much below average/median (less than 70%). Reservoir specific ROD descriptions are used in place of this terminology where applicable.

[49] Unregulated inflow adjusts for the effects of operations at upstream reservoirs. It is computed by adding the change in storage and the evaporation losses from upstream reservoirs to the observed inflow. Unregulated inflow is used because it provides an inflow time series that is not biased by upstream reservoir operations.

[50] Inflow statistics throughout this document will be compared to the mean of the 30-year period 1991-2020, unless otherwise noted.

[51] Snowpack, snow water equivalent and precipitation statistics throughout this document are provided by the Natural Resources Conservation Service and are based on the median for the 30-year period 1991-2020, unless otherwise noted. Hydrologic conditions are described in the following manner: much above average/median (greater than 130%), above average/median (111%-130%), near average/median (90%-110%), below average/median (70%-89%), and much below average/median (less than 70%). Reservoir specific ROD descriptions are used in place of this terminology where applicable.

[52] Water year 2023 forecast information from the CBRFC is available online at: https://www.cbrfc.noaa.gov/wsup/graph/espgraph_hc.html?year=2023&id=GLDA3.

Below Hoover Dam, tributary inflow for water year 2023 measured at the Bill Williams River below Alamo Dam gage totaled 0.147 maf (181 mcm), and tributary inflow measured at the Gila River near Dome gage totaled 0.092 maf (113 mcm).[53]

The Colorado River total system storage experienced a net increase of 5.71 maf (7,040 mcm) in water year 2023. Reservoir storage in Lake Powell increased during water year 2023 by 2.99 maf (3,690 mcm). Reservoir storage in Lake Mead increased during water year 2023 by 1.54 maf (1,900 mcm). At the beginning of water year 2023 (October 1, 2022), Colorado River total system storage was 33 percent of capacity. As of September 30, 2023, total system storage was 43 percent of capacity.

Tables 1 and 2 list the October 1, 2023, reservoir vacant space, live storage, water elevation, percent of capacity, change in storage, and change in water elevation during water year 2023.

Table 1. Reservoir Conditions on October 1, 2023 (English Units)

Reservoir	Vacant Space (maf)	Live Storage (maf)	Water Elevation (ft)	Percent of Capacity (%)	Change in Storage (maf)	Change in Elevation (ft)
Fontenelle	0.049	0.285	6,499.60	85	0.011	1.5
Flaming Gorge	0.415	3.26	6,029.77	89	0.576	16.8
Blue Mesa	0.196	0.629	7,496.50	76	0.337	49.8
Navajo	0.501	1.15	6,047.88	70	0.275	27.2
Lake Powell	14.52	8.79	3,573.58	38	2.99	44.2
Lake Mead	17.25	8.87	1,065.82	34	1.54	20.8
Lake Mohave	0.223	1.59	638.85	88	-0.013	-0.3
Lake Havasu	0.037	0.58	448.12	94	0.003	0.2
Total	33.19	25.15		43	5.72	

[53] Tributary inflows from the Bill Williams River and Gila River to the mainstream are very sporadic. These flows occur very seldom and when they do, they are typically of high magnitude.

Table 2. Reservoir Conditions on October 1, 2023 (Metric Units)

Reservoir	Vacant Space	Live Storage	Water Elevation	Percent of Capacity	Change in Storage	Change in Elevation
	(mcm)	(mcm)	(m)	(%)	(mcm)	(m)
Fontenelle	60	352	1,981.08	85	14	0.5
Flaming Gorge	512	4,016	1,837.87	89	710	5.1
Blue Mesa	241	776	2,284.93	76	416	15.2
Navajo	618	1,415	1,843.39	70	339	8.3
Lake Powell	17,915	10,842	1,089.23	38	3,690	13.5
Lake Mead	21,276	10,942	324.86	34	1,900	6.3
Lake Mohave	275	1,958	194.72	88	-16	-0.1
Lake Havasu	46	718	136.59	94	4	0.1
Total	40,940	31,020		43	7,060	

2024 WATER SUPPLY ASSUMPTIONS

For 2024 operations, three reservoir unregulated inflow scenarios were developed and analyzed: minimum probable, most probable, and maximum probable.

There is considerable uncertainty associated with streamflow forecasts and projections of reservoir operations made a year in advance. The National Weather Service's CBRFC forecasts the inflow for the minimum probable (90 percent exceedance), most probable (50 percent exceedance), and maximum probable (10 percent exceedance) inflow scenarios using an Ensemble Streamflow Prediction model. Based upon the August CBRFC forecast, the range of unregulated inflows is projected to be as follows:

- The forecasted minimum probable unregulated inflow to Lake Powell in water year 2024 is 6.10 maf (7,520 mcm), or 64 percent of average.
- The forecasted most probable unregulated inflow to Lake Powell in water year 2024 is 10.00 maf (12,330 mcm), or 104 percent of average.
- The forecasted maximum probable unregulated inflow to Lake Powell in water year 2024 is 17.70 maf (21,830 mcm), or 184 percent of average.

Projected unregulated inflow volumes[54] into Lake Powell for specific time periods for these three forecasted inflow scenarios are shown in Tables 3 and 4.

Inflows to the mainstream from Lake Powell to Lake Mead, Lake Mead to Lake Mohave, Lake Mohave to Lake Havasu, and below Lake Havasu are projected using historic data over the five-year period of January 2018 through December 2022, inclusive. These five years of historic data are representative of the most recent hydrologic conditions in the Lower Basin. The most probable side inflows into each reach are estimated as the arithmetic mean of the five-year record. The maximum probable and minimum probable projections for each reach are the 10 percent and 90 percent exceedance values, respectively, of the five-year record. For the reach from Lake Powell to Lake Mead, the minimum probable inflow during water year 2024 is 0.634 maf (782 mcm), the most probable inflow is 0.786 maf (970 mcm), and the maximum probable inflow is 0.972 maf (1,200 mcm).

The projected monthly volumes of inflow were input into the 24-Month Study and used to project potential reservoir operations for 2024. Starting with the August 2023 24-Month Study projection of the October 1, 2024 reservoir storage conditions, the projected monthly releases for each reservoir were adjusted until release and storage levels best accomplished project purposes and applicable operational objectives.

For the latest monthly projections for the major reservoirs in the Colorado River system, please see the most recent 24-Month Study report available on these Reclamation websites:

https://www.usbr.gov/uc/water/crsp/studies/index.html, or
https://www.usbr.gov/lc/region/g4000/24mo/index.html.

[54] 24-Month Study projections using the CBRFC unregulated inflow forecast do not represent the full range of future possibilities that could occur with different scenarios. For more information, please see the Colorado River Modeling website online at: https://www.usbr.gov/lc/region/g4000/riverops/coriver-projections.html.

Table 3. Projected Unregulated Inflow into Lake Powell for Water Year 2024 (English Units)[55]

Time Period	Probable Minimum (maf)	Most Probable (maf)	Probable Maximum (maf)
10/2023 – 12/2023	1.08	1.46	2.20
1/2024 – 3/2024	0.83	1.41	2.56
4/2024 – 7/2024	3.77	6.42	11.65
8/2024 – 9/2024	0.421	0.715	1.297
10/2024 – 12/2024	1.05	1.27	1.65
Water Year 2024	6.10	10.00	17.70
Calendar Year 2024	6.07	9.82	17.10

Table 4. Projected Unregulated Inflow into Lake Powell for Water Year 2024 (Metric Units)

Time Period	Probable Minimum (mcm)	Most Probable (mcm)	Probable Maximum (mcm)
10/2023 – 12/2023	1,330	1,800	2,710
1/2024 – 3/2024	1,020	1,740	3,160
4/2024 – 7/2024	4,650	7,920	14,370
8/2024 – 9/2024	520	890	1,600
10/2024 – 12/2024	1,300	1,570	2,040
Water Year 2024	7,520	12,350	21,840
Calendar Year 2024	7,490	12,110	21,170

[55] All values in Tables 3 and 4 are projected inflows based upon the August 2023 CBRFC forecast. The CBRFC most probable forecast is issued as monthly values. The CBRFC probable minimum and probable maximum forecasts are issued as water year totals, which Reclamation disaggregates to monthly values using monthly proportions of the 10th and 90th percentiles, respectively, of the 1991-2020 unregulated inflow.

SUMMARY OF RESERVOIR OPERATIONS IN 2023 AND PROJECTED 2024 RESERVOIR OPERATIONS

The operation of the Colorado River reservoirs has affected some aquatic and riparian resources. Controlled releases from dams have modified temperature, sediment load, and flow patterns, resulting in increased productivity of some riparian and non-native aquatic resources and the development of economically significant sport fisheries. However, these same releases can have detrimental effects on endangered and other native species. Operating strategies designed to protect and enhance aquatic and riparian resources have been established after appropriate NEPA compliance at several locations in the Colorado River Basin.

In the Upper Basin, public stakeholder work groups have been established at Fontenelle Dam, Flaming Gorge Dam, the Aspinall Unit, and Navajo Dam. These work groups provide a public forum for dissemination of information regarding ongoing and projected reservoir operations throughout the year and allow stakeholders the opportunity to provide information and feedback with respect to ongoing reservoir operations. Additionally, the Glen Canyon Dam Adaptive Management Work Group (AMWG)[56] was established in 1997 as a chartered committee under the Federal Advisory Committee Act of 1972 (Public Law 92-463).

Modifications to projected operations are routinely made based on changes in forecasted conditions or other relevant factors as discussed below. Within the parameters set forth in the Law of the River and considering the Upper Colorado River Endangered Fish Recovery Program (UCRIP),[57] the San Juan River Basin Recovery Implementation Program (SJRIP),[58] Section 7 consultations under the Endangered Species Act, and other downstream concerns, modifications to projected monthly operations may be based on other factors in addition to changes in streamflow forecasts. Decisions on spring peak releases and downstream habitat target flows may be made midway through the runoff season. Reclamation will conduct meetings with Recovery Program participants, the USFWS, other Federal agencies, representatives of the Basin States, and with public stakeholder work groups to facilitate the discussions necessary to finalize site-specific projected operations.

The following paragraphs discuss reservoir operations in 2023 and the range of probable projected 2024 operations of each of the reservoirs with respect to applicable provisions of compacts, the Consolidated Decree, statutes, regulations, contracts, agreements, and instream flow needs for maintaining or improving aquatic and riparian resources where appropriate.

Fontenelle Reservoir

Reservoir storage in Fontenelle increased during water year 2023. At the beginning of water year 2023, Fontenelle storage was 82 percent of live capacity at elevation 6,497.98 feet (1,980.58 meters), with 0.273 maf (337 mcm) in storage. The unregulated inflow to Fontenelle during water year 2023 was 1.27 maf (1,570 mcm) which is 118 percent of average. At the end of the water year, September 30, 2023, Fontenelle storage was at 85 percent of live capacity at

[56] Information on the AMWG can be found at: https://www.usbr.gov/uc/progact/amp/amwg.html.
[57] Information on the UCRIP can be found at: http://coloradoriverrecovery.org.
[58] Information on the SJRIP can be found at: https://www.fws.gov/southwest/sjrip.

elevation 6,499.60 feet (1,981.08 meters), with a storage of 0.285 maf (352 mcm) resulting in a net increase during water year 2023 of 0.012 maf (14.8 mcm).

Hydrologic conditions in the Upper Green River Basin above Fontenelle were above average in water year 2023. Snowpack development tracked above median with above average winter conditions resulting in an above average runoff forecast. Peak snow water equivalent reached 130 percent of seasonal median on April 8, 2023. The observed inflow during the April to July season was 0.951 maf (1,173 mcm), or 129 percent of average.

Fontenelle Reservoir storage peaked at 95 percent of full capacity in water year 2023. The reservoir elevation peaked at 6,503.98 feet (1,982.41 meters) on August 13, 2023, which was 2.02 feet (0.62 meters) below the spillway crest. Daily inflow peaked at 8,879 cfs (251 cms) on May 27, 2023. Reservoir releases were made to balance downstream water resources needs and power production, while also allowing for filling the reservoir to maintain sufficient water in storage for use through the fall and winter months. Due to the above average hydrologic conditions, there was an average spring peak release at Fontenelle Reservoir.

Based on the August 2023 24-Month Study, the most probable April through July inflow for Fontenelle Reservoir during water year 2024 is 0.690 maf (851 mcm) or 113 percent of average. This volume exceeds the 0.334 maf (412 mcm) live storage capacity of Fontenelle Reservoir. For this reason, the most probable and maximum probable inflow scenarios would require releases during the spring that exceed the capacity of the powerplant to avoid uncontrolled spills from the reservoir. It is likely that Fontenelle Reservoir will fill during water year 2024. In order to minimize high spring releases and to maximize downstream water resources and power production, the reservoir will most likely be drawn down to about elevation 6,466.43 feet (1,970.97 meters) by late March 2024, which is 3.43 feet (1.05 meters) above the minimum operating level and corresponds to a volume of 0.099 maf (122 mcm) of live storage.

Flaming Gorge Reservoir

Reservoir storage in Flaming Gorge increased during water year 2023. At the beginning of water year 2023, Flaming Gorge storage was 74 percent of live capacity at elevation 6,013.01 feet (1,832.77 meters), with 2.68 maf (3,310 mcm) in storage. The unregulated inflow to Flaming Gorge during water year 2023 was 1.85 maf (2,280 mcm) which is 131 percent of average. At the end of the water year, Flaming Gorge storage was at 89 percent of live capacity at elevation 6,029.77 feet (1,837.87 meters), with 3.26 maf (4,020 mcm) resulting in a net increase during water year 2023 of 0.580 maf (715 mcm).

Spring period hydrologic classification in the Upper Green River Basin above Flaming Gorge was moderately wet in water year 2023 where the snowpack tracked above median with above average winter conditions resulting in above average runoff forecasts. Peak snow water equivalent reached 130 percent of seasonal median on April 8, 2023. The May forecast for the April through July inflow into Flaming Gorge Reservoir was 1.30 maf (1,600 mcm), or 135 percent of average. The observed inflow during the spring runoff season was 1.46 maf (1,800 mcm), or 151 percent of average. Observed flow volumes from the Yampa River Basin fell into the wet hydrologic condition.

A 2023 Plan[59] was approved by the Upper Division States, the Upper Colorado River Commission, and the Department of the Interior. The 2023 Plan emphasized recovery of prior DROA releases totaling 0.588 maf (725 mcm) from Flaming Gorge.

The Flaming Gorge Operation Plan for May 2023 through April 2024 (FG-Ops) was developed and approved by Reclamation pursuant to the 2006 Flaming Gorge ROD and includes the 2023 Plan. The FG-Ops outlines UCRIP flow requests for the average, moderately wet, and wet hydrologic classifications.[60] The average scenario includes the Larval Trigger Study Plan (LTSP) spring release (spring release based on a biological trigger)[61] and an optional smallmouth bass (SMB) flow spike (to disrupt the spawning success of non-native smallmouth bass),[62] pending hydrology and water temperature. Experiments that are outlined in the FG-Ops Plan implement flow ranges and targets from LaGory et al. (2019).[63] After much consideration, the Flaming Gorge Technical Working Group representatives, Colorado River Recovery Program, and subject matter experts agreed that the smallmouth bass spike flow experiment would not be recommended this operational year. This was due to potential negative impacts to the endangered Colorado pikeminnow (CPM).

LTSP spring releases were timed with a biological trigger. After public notification, releases from Flaming Gorge Dam were increased to the full powerplant capacity of 4,600 cfs (130 cms) and the full bypass capacity of 4,000 cfs (113 cms) on June 8, 2023 for four days then ramped down by 2,000 cfs/day (56.6 cms/day) to 900 cfs (25.5 cms).[63] Yampa River flows at the Deerlodge gage during the spring peak releases peaked at 20,100 cfs (569 cms) on May 18, 2023. The peak release from Flaming Gorge Dam occurred after the Yampa River peak. Flows measured on the Green River at the Jensen, Utah gage reached levels at or above 18,600 cfs (526 cms) for 8 days in May and June, 2023, with an average daily peak of 20,100 cfs (569 cms) on May 19, 2023. The spring peak release in Reach 2 for this hydrologic classification is greater than or equal to 18,600 cfs (526 cms) for 8 days.

In water year 2023, Flaming Gorge Reservoir was operated in accordance with the 2006 Flaming Gorge ROD. Water year 2023 winter base flow releases ranged from 1,700 cfs (48.1

[59] Drought Response Operations Framework and Plan: https://www.usbr.gov/dcp/docs/DROA/20230517-2023DROAPlan-508-UCRO.pdf.

[60] The adaptive management process will rely on ongoing or added Recovery Program activities for monitoring and studies to test the outcomes of modifying the flows and release temperatures from Flaming Gorge Dam. ROD Operation of Flaming Gorge Dam Final Environmental Impact Statement, February 2006. Available online at: https://www.usbr.gov/uc/envdocs/rod/fgFEIS/final-ROD-15feb06.pdf.

[61] The LTSP's primary objective is to determine the effects of timing of Flaming Gorge spring release on razorback sucker larvae in the reach below the confluence of the Green and Yampa Rivers. The LTSP Report is available online at: https://www.usbr.gov/uc/water/crsp/wg/fg/twg/twgSummaries.html.

[62] Smallmouth bass flow spike study plan titled: Evaluate effects of flow spikes to disrupt reproduction of smallmouth bass in the Green River downstream of Flaming Gorge Dam. K.R. Bestgen, 2018. Available online at: https://www.coloradoriverrecovery.org/documents-publications/technical-reports/isf/Bestgen2018Smallmouth%20bass%20study%20planNovember2018.pdf.

[63] LaGory, K.E., K.R. Bestgen, H. Patno, J. Wilhite, D. Speas, and M. Trammell. 2019. *Evaluation and Suggested Revisions of Flow and Temperature Recommendations for Endangered Fish in the Green River Downstream of Flaming Gorge Dam*. Final report to the U.S. Fish and Wildlife Service Colorado River Endangered Fish Recovery Program, Denver, Colorado, October 2019 and pending approval through the UCRIP Management Committee.

cms) to approximately 1,750 cfs (49.5 cms). The April through July observed unregulated inflow resulted in an initial hydrologic classification of moderately wet for the summer baseflow period and a moderately wet hydrologic operation was conducted for the month of August. The August observed unregulated inflow was 0.095 maf (117 mcm), a 39 percent exceedance value, and within the average hydrologic classification range. Due to February 2024 end of month calculations and the August observed unregulated inflow, an average hydrologic classification will be targeted for the remainder of the baseflow period. The hydrologic classification for the baseflow period is subject to change pending hydrologic conditions. The August releases are within the 2000 Flow and Temperature Recommendations range of 2,400 cfs (67.9 cms) to 2,800 cfs (79.2 cms) at Reach 2 including being within the +/- 40 percent range flexibility. The September releases are within the 2000 Flow and Temperature Recommendations range of 1,500 cfs (42.4 cms) to 2,400 cfs (67.9 cms) at Reach 2. To meet CPM flow targets in August and September the flow range specified for CPM in LaGory et al. (2019)[63] were achieved in Reach 2 for a moderately wet and average hydrologic classification. Summer base flow average daily releases ranged from 900 cfs (25.5 cms) to 1,960 cfs (55.5 cms).

A spring peak release is projected to occur in May or June 2024 and will be timed to coincide with either the peak flows of the Yampa River or emergence of razorback sucker larvae. Reclamation is considering long-term implementation strategies for the UCRIP LTSP.

Based on the August 2023 24-Month Study, the most probable April through July unregulated inflow scenario for Flaming Gorge Reservoir during water year 2024 is 0.920 maf (1,130 mcm), or 95 percent of average. The peak elevation is expected to be approximately 6,032.18 feet (1,838.61 meters) near mid-July 2024. By the end of water year 2024, Flaming Gorge Reservoir is projected to be at elevation 6,030.62 feet (1,838.13 meters), with a storage of 3.29 maf (4,060 mcm), or 90 percent of live capacity.

Under the minimum probable 2024 April through July inflow forecast of 0.587 maf (724 mcm), a 4,600 cfs (130 cms) 2024 spring peak release will be implemented. Under the maximum probable 2024 April through July inflow forecast of 1.70 maf (2,100 mcm), an 8,600 cfs (243 cms) spring peak release will be implemented.

The UCRIP, in coordination with Reclamation, USFWS, and WAPA, will continue conducting studies associated with floodplain inundation. Such studies may result in alternatives for meeting flow and temperature recommendations at lower peak flow levels where feasible.

Blue Mesa, Morrow Point, and Crystal Reservoirs (Aspinall Unit)

Reservoir storage content in Blue Mesa increased during water year 2023. At the beginning of water year 2023, Blue Mesa storage content was 35 percent of live capacity at elevation 7,446.72 feet (2,269.76 meters), with 0.292 maf (360 mcm) in storage. The unregulated inflow to Blue Mesa during water year 2023 was 1.06 maf (1,310 mcm), which was 117 percent of average. At the end of the water year, Blue Mesa storage content was 76 percent of live capacity at elevation 7,496.50 feet (2,284.93 meters), with 0.629 maf (776 mcm) resulting in a net increase during water year 2023 of 0.337 maf (416 mcm).

A 2023 DROA Plan was approved by the Upper Division States, the Upper Colorado River Commission, and the Department of the Interior. The 2023 Plan emphasized recovery of prior DROA releases totaling 0.036 maf (44 mcm) from Blue Mesa.

Above average snowpack conditions occurred during the winter months of water year 2023 in the Gunnison River Basin. Snow measurement sites in the basin reported above median seasonal snow water equivalent levels throughout the winter and into the spring of 2023 resulting in an April 1, 2023 snow water equivalent for the Gunnison River Basin that was 164 percent of median, using the 1991-2020 hydrologic period of record.

The fall-through-winter releases from Crystal Dam were consistently near 350 cfs (9.90 cms) after the Gunnison Tunnel ended diversions for irrigation season on November 1, 2022. On April 3, 2023, releases from Crystal Dam were increased for the 2023 irrigation season as operation of the Gunnison Tunnel began diverting 200 cfs (5.66 cms). Flows through the Black Canyon were maintained within the range of approximately 350 cfs (9.90 cms) to approximately 800 cfs (22.6 cms) until May 12, 2023.

The May 2023 final forecast[64] for the unregulated inflow to Blue Mesa for the April through July runoff period was 0.830 maf (1,020 mcm), which was 130 percent of average. This forecast was used to establish the hydrologic category for water year 2023 as average wet with a peak flow target established for the Gunnison River of 14,350 cfs (408 cms) for 2 days and 8,070 cfs (228 cms) for 20 days as measured at the Gunnison River near Grand Junction, CO stream gage (Whitewater gage).[65]

On May 12, 2023, high flows were forecasted for the North Fork of the Gunnison River. Therefore, releases were increased from Crystal, Morrow Point, and Blue Mesa to target a single downstream Peak Flow for the flow levels and durations described in the Aspinall ROD and the Black Canyon Water Right Decree. Specifically, these releases were made to target a two-day peak flow of 14,350 cfs (408 cms) as measured at the Whitewater gage, and a 24-hour peak flow of 6,400 cfs (181 cms) in the Black Canyon.

By May 18, 2023, flows in the Gunnison River near Delta approached a level that was concerning to the operators of the Delta wastewater treatment plant (13,000 cfs (368 cms)). Due to the concerns with the Delta wastewater treatment plant and additional high water concerns in Delta County, Reclamation halted the ramp up schedule and held releases steady to keep flows below 13,000 cfs (368 cms) at Delta. On May 22, 2023, a down ramp was scheduled to return releases to full powerplant capacity (approximately 1,990 cfs (56.3 cms)) from Crystal Reservoir, which was achieved on May 26, 2023. During spring peak operations, flows in the Gunnison River as measured at the Whitewater gage achieved an average daily peak flow of above 14,350 cfs (408 cms) for four days on May 17-20, 2023, reaching 17,400 cfs (492 cms) on May 18, 2023.

[64] The term "final forecast" or "official forecast" refers to the CBRFC runoff forecast for unregulated inflow into CRSP reservoirs that is received by Reclamation during the first few business days of each month.
[65] Link to the Gunnison River near Grand Junction, CO USGS gage: https://waterdata.usgs.gov/monitoring-location/09152500/#parameterCode=00065&period=P7D.

As noted, due to high downstream tributary inflow, originally planned releases from the Aspinall Unit were not needed to reach earlier projections of ROD objectives. Flows in the Gunnison River measured at the Whitewater gage achieved an average daily flow of above 8,070 cfs (228 cms) for 32 days. These flows doubled the target downstream peak flow durations described in the Aspinall ROD and exceeded the downstream half bank flow levels and durations described in the Aspinall ROD by twelve days. Flow in the Black Canyon during this time peaked on May 18, 2023, at 4,650 cfs (135 cms).

On June 1, 2023, Reclamation determined that a de-synchronized peak of 6,400 cfs (181 cms) would be targeted pursuant to Section 32.4.4 of the Black Canyon Water Right Decree, which states that to the extent practicable, the Black Canyon Water Right target peak flow shall be coordinated with releases made pursuant to the ROD to achieve a single peak flow, subject to section 32.2.2 (flood prevention). On June 21, 2023, releases increased from the Aspinall Unit to ramp up to a total release rate of 7,297 cfs (206 cms) for 24 consecutive hours, which occurred on June 28, 2023. The 24-hour peak flow in the Black Canyon was 7,404 cfs (210 cms) which occurred on June 27-28, 2023.

Following this action, releases were gradually reduced until July 8, 2023, when bypass releases at Crystal were terminated and all releases were made through the Crystal powerplant. The peak elevation at Blue Mesa was achieved on June 25, 2023 when the elevation was 7,512.47 feet (2,289.80 meters) with a corresponding storage of 0.765 acre-feet (944 mcm) or 92 percent of capacity.

For water year 2024, the Aspinall Unit will be operated in compliance with the 2012 Aspinall ROD, including all required consultations and consistent with applicable law, while maintaining and continuing to meet its Congressionally authorized purposes.

Based on the August 2023 24-Month Study, the projected most probable unregulated inflow for water year 2024 into Blue Mesa Reservoir is 0.895 maf (1,100 mcm), or 99 percent of average. The reservoir is expected to reach a seasonal low elevation of 7,487.45 feet (2,228.17 meters) in March 2024. The peak elevation is expected to be approximately 7,508.79 feet (2,288.68 meters) near the end of July 2024. By the end of water year 2024, Blue Mesa Reservoir is projected to be at elevation 7,500.21 feet (2,286.06 meters), with a storage content of 0.660 maf (814 mcm), or 80 percent of capacity.

Under the minimum probable 2024 April through July inflow forecast of 0.378 maf (466 mcm), there will be 1-day spring peak release during the spring of 2024. Under the maximum probable 2024 April through July inflow forecast of 0.932 maf (1,150 mcm), a 10-day spring peak release will be implemented as described in the 2012 Aspinall ROD for water year 2024.

Navajo Reservoir

Storage in Navajo Reservoir increased during water year 2023. At the beginning of water year 2023, Navajo storage was 53 percent of live capacity at elevation 6,020.65 feet (1,835.09

meters), with 0.872 maf (1,080 mcm) in storage. The modified unregulated inflow[66] to Navajo during water year 2023 was 1.22 maf (1,500 mcm), or 134 percent of average. At the end of the water year, Navajo storage was at 70 percent of live capacity at elevation 6,047.88 feet (1,843.39 meters), with 1.15 maf (1,420 mcm) resulting in a net increase during water year 2023 of 0.275 maf (339 mcm).

Reservoir storage in Navajo peaked at an elevation of 6,063.80 feet (1,848.25 meters) on May 30, 2023. This was 21.20 feet (6.46 meters) below full pool. The April through July modified unregulated inflow into Navajo Reservoir in water year 2023 was 1.03 maf (1,270 mcm), or 164 percent of average.

The San Juan Flow Recommendations,[67] completed by the SJRIP in May 1999, provide flow recommendations that promote the recovery of the endangered CPM and razorback sucker, maintain important habitat for these two species as well as the other native species, and provide information for the evaluation of continued water development in the basin. In water year 2022, Navajo Reservoir operated under the SJRIP and Reclamation's interim operations. Under the interim operations, releases for SJRIP recovery purposes are dependent on annual hydrology and available water may be released as a spring peak release, an augmentation of existing target base flows, or for some other SJRIP purposes. The interim operations specify that the reservoir releases will be calculated to target an End of Water Year Storage Target elevation of 6,063.00 feet (1,848.00 meters). The interim operations also specify a minimum elevation of 6,050.00 feet (1,844.04 meters) for the purposes of calculating water available to release as a spring peak release. All available water over this target, minus the water required for minimum releases and contracts, will be considered for release as a spring peak hydrograph if the SJRIP requests. The available water must equate to at least 21 days at 5,000 cfs (142 cms) to be released.

Navajo Reservoir was operated in compliance with the 2006 Navajo Reservoir ROD in 2023, including targeting the SJRIP's recommended base flows. The target base flow was calculated using the weekly average of gaged flows throughout the critical habitat area from Farmington to Lake Powell. Based on the SJRIP and Reclamation's interim operations for water year 2023, there was a spring peak release at Navajo Reservoir that peaked at 4,600 cfs (130.3 cms) totaling 0.235 maf (290 mcm).

During water year 2024, Navajo Reservoir will be operated in accordance with the 2006 Navajo Reservoir ROD. Navajo Reservoir storage levels are expected to be near average in 2024 under the most probable inflow forecast. Base releases from the reservoir will likely range from 250 cfs (7.07 cms) to 600 cfs (17.0 cms) through the winter. Based on the August 2023 most probable April through July modified unregulated inflow forecast of 0.577 maf (712 mcm) in 2024, the August 2023 24-Month Study projects no spring peak release would be recommended by the SJRIP and Reclamation's interim operations for water year 2024. The reservoir is projected to reach a peak elevation of 6,076.98 feet (1,852.26 meters) in July 2024.

[66] Modified unregulated inflow into Navajo Reservoir is calculated as the observed inflow adjusted for the San Juan Chama diversions and change in storage at Vallecito Reservoir.
[67] Flow Recommendations for the San Juan River, May 1999. Available online at: https://www.fws.gov/southwest/sjrip/pdf/DOC_Flow_recommendations_San_Juan_River.pdf.

The reservoir is projected to reach a minimum elevation of 6,053.39 feet (1,845.07 meters) in October 2023.

Under the minimum probable 2024 April through July inflow forecast of 0.273 maf (337 mcm), there will be no spring peak release during the spring of 2024. Under the maximum probable 2024 April through July inflow forecast of 1.10 maf (1,353 mcm), a 60-day spring peak release will be recommended as described by SJRIP and Reclamation's interim operations for water year 2024.

Lake Powell

Reservoir storage in Lake Powell increased during water year 2023. At the beginning of water year 2023, Lake Powell storage was 25 percent of live capacity at elevation 3,529.33 feet (1,075.74 meters), with 5.80 maf (7,150 mcm) in storage. The unregulated inflow to Lake Powell during water year 2023 was 13.42 maf (16,550 mcm) which is 140 percent of average. At the end of the water year, Lake Powell storage was at 38 percent of live capacity at elevation 3,573.58 feet (1,089.23 meters), with 8.79 maf (10,840 mcm) resulting in a net increase during water year 2023 of 2.99 maf (3,690 mcm).

The August 2022 24-Month Study was run to project the January 1, 2023, elevations of Lake Powell and Lake Mead and determine the water year 2023 operating tier for Lake Powell. Using the most probable inflow scenario, and with an 8.23 maf (10,150 mcm) annual release pattern for Lake Powell, the January 1, 2023, reservoir elevations of Lake Powell and Lake Mead were projected to be 3,496.65 feet (1,065.78 meters) and 1,041.88 feet (317.57 meters), respectively. Given these projections, the operating tier and annual release volume from Lake Powell during water year 2023 was consistent with the Lower Elevation Balancing Tier (Section 6.D.1 of the 2007 Interim Guidelines) and, under Section 6.D.1, when the projected January 1 Lake Powell elevation is below 3,525.00 feet (1,074.42 meters), the Secretary shall balance the contents of Lake Mead and Lake Powell, but shall release not more than 9.50 maf (11,720 mcm) and not less than 7.00 maf (8,630 mcm) from Lake Powell in the water year. The operational neutrality of the 0.480 maf (592 mcm) that was retained in Lake Powell under the May 2022 action was removed,[68] such that balancing releases in water year 2023 were based on physical contents of Lake Powell and Lake Mead, consistent with Section 6.D.1 of the 2007 Interim Guidelines, and to protect Lake Powell from declining below elevation 3,525.00 feet (1,074.42 meters) at the end of December 2023. After removal of operational neutrality, the 0.480 maf (592 mcm) was released from Lake Powell in water year 2023.

Per Section 6.D.1 of the 2007 Interim Guidelines, Lake Powell and Lake Mead contents were balanced as closely as practicable and the resulting water year 2023 release from Lake Powell was 8.58 maf (10,580 mcm).[69]

The April through July unregulated inflow to Lake Powell in water year 2023 was 10.62 maf (13,100 mcm) which was 166 percent of average. During the 2023 April through July runoff

[68] For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf.

[69] Lake Powell end of water year storage was 8.79 maf (10,840 mcm). Lake Mead end of water year storage was 8.87 maf (10,940 mcm).

period, Lake Powell's water surface elevation peaked on July 3, 2023, at 3,584.68 feet (1,092.61 meters), which was 115.32 feet (35.15 meters) below full pool. This elevation corresponds to a live storage content of 9.67 maf (11,930 mcm).

In water year 2023, Glen Canyon Dam was operated in compliance with the LTEMP ROD. In April 2023, Reclamation conducted a spring flow experimental release from Glen Canyon Dam, consistent with the LTEMP and related compliance documents.[70] Reclamation released the maximum available capacity of 38,800 cfs (1,100 cms) during the experiment which was conducted beginning on April 24 and ending on April 27, 2023. Approximately 0.090 maf (111 mcm) was bypassed during the experiment. The total April 2023 monthly release and annual release from Glen Canyon Dam in water year 2023 did not change as a result of the experimental releases.

On October 4, 2023, Reclamation published a Federal Register Notice indicating its intent to prepare a SEIS for the LTEMP ROD.[71] The LTEMP SEIS will analyze flow options to prevent smallmouth bass and other warm water invasive non-native fish from establishing below Glen Canyon Dam (by preventing additional spawning) and will analyze new information regarding the sediment accounting window associated with the LTEMP high-flow experiment protocol. Any changes to operations resulting from this NEPA process will affect the timing of hourly, daily, monthly, and experimental releases from Glen Canyon Dam; annual releases from Glen Canyon Dam will not be affected. The draft SEIS was published to the Federal Register on February 9, 2024, which started the 45-day public comment period that then closed on March 25, 2024.

The ten-year total flow of the Colorado River at Lee Ferry[72] for water years 2014 through 2023 is 86.08 maf (106,180 mcm). This total is computed as the sum of the flow of the Colorado River at Lees Ferry, Arizona, and the Paria River at Lees Ferry, Arizona, surface water discharge stations which are operated and maintained by the United States Geological Survey.

2024 Operating Tier and Projected Operations for Glen Canyon Dam. The January 1, 2024 reservoir elevations of Lake Powell and Lake Mead are projected under the most probable inflow scenario, with an 8.23 maf (10,150 mcm) release pattern in water year 2024, to be 3,568.57 feet (1,087.70 meters) and 1,070.27 feet (326.22 meters), respectively, based on the August 2023 24-Month Study. Given these projections, the operating tier and annual release volume from Lake Powell during water year 2024 will be consistent with the Mid-Elevation Release Tier (Section 6.C.1 of the 2007 Interim Guidelines) and, under Section 6.C.1, the annual release would be 7.48 maf (9,230 mcm). The Mid-Elevation Release Tier has no possibility for adjustments to the operation of Lake Powell during the water year, unless otherwise prescribed under the 2007 Interim Guidelines and the 2024 Interim Guidelines SEIS ROD, and would remain at 7.48 maf (9,230 mcm). 2024 Operating Tier and Projected Operations for Glen Canyon Dam. Reclamation will continue to carefully monitor hydrologic

[70] The decision memo regarding the spring flow experiment is available online at: https://www.usbr.gov/uc/progact/amp/pdfs/LTEMP/20230420-Spring2023HFE-DecisionMemo-508-UCRO.pdf.
[71] Federal Register Notice available online at: https://www.federalregister.gov/documents/2023/10/04/2023-22077/notice-of-intent-to-prepare-a-supplemental-environmental-impact-statement-for-the-december-2016.
[72] A point in the mainstream of the Colorado River one mile below the mouth of the Paria River.

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, the Republic of Mexico, and other partners on Colorado River operations to consider future protective measures for both Lake Powell and Lake Mead.

Maintenance of the eight generating units at Glen Canyon Dam requires them to be taken out of service, in pairs, once each year for approximately one month. Additionally, in water years 2020 through 2024, all four transformers will be replaced, requiring the units to be taken out of service, in pairs. This work should be completed by the end of calendar year 2024. Reclamation is planning to perform maintenance on each of the four hollow jet valves in water year 2024. Outages for annual maintenance and unit replacements are coordinated between Reclamation offices in Salt Lake City, Utah, and Page, Arizona, and WAPA to minimize impacts to operations.

Because of less than full storage conditions in Lake Powell resulting from drought in the Colorado River Basin, releases from Glen Canyon Dam for dam safety purposes are highly unlikely in 2024. If implemented, releases greater than powerplant capacity would be made consistent with the 1956 Colorado River Storage Project Act,[73] the CRBPA, the LTEMP ROD, and the Glen Canyon Dam Operating Criteria.

Releases from Lake Powell in water year 2024 will continue to reflect consideration of the uses and purposes identified in the authorizing legislation for Glen Canyon Dam. Monthly releases will also be consistent with the LTEMP ROD and applicable Secretarial decisions and are updated to be consistent with annual volumes determined pursuant to the 2007 Interim Guidelines and the 2024 Interim Guidelines SEIS ROD.

For the latest monthly projections for Lake Powell, please see the most recent 24-Month Study report available on Reclamation's Upper Colorado Region Water Operations website: https://www.usbr.gov/uc/water/crsp/studies/index.html.

Daily and hourly releases in 2024 will be made according to the parameters of the Glen Canyon Dam Operating Criteria. These parameters set the maximum and minimum flows and ramp rates within which reservoir releases must be made. Exceptions to these parameters will be made in accordance with the Emergency Exception Criteria as described in the Glen Canyon Dam Operating Criteria.

During water year 2024, the Department of the Interior will coordinate planning for experimental flows from Glen Canyon Dam in accordance with the 2016 Glen Canyon Dam LTEMP ROD.

[73] Available online at: https://www.usbr.gov/lc/region/pao/pdfiles/crspuc.pdf.

Lake Mead

For calendar year 2023, a Shortage Condition was the criterion governing the operation of Lake Mead in accordance with Article III(3)(c) of the Operating Criteria, Article II(B)(3) of the Consolidated Decree, Section 2.D.1.b of the 2007 Interim Guidelines, applicable provisions of the LB DCP Agreement, and Sections III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP Agreement, and taking into consideration water conservation efforts under the LB DCP Agreement, a December 15, 2021 MOU to facilitate near-term actions to maintain the water surface elevation at Lake Mead (the "500 Plus Plan"),[74] the LC Conservation Program, and Section 2.E of the 2007 Interim Guidelines as amended by the 2024 Interim Guidelines SEIS ROD. Delivery of water to Mexico was scheduled in accordance with Article 15 of the 1944 United States-Mexico Treaty and Minutes No. 242, 323, and 327 of the IBWC.

Lake Mead began water year 2023 on October 1, 2022, at elevation 1,045.03 feet (318.53 meters), with 7.33 maf (9,040 mcm) in storage, which is 28 percent of the conservation capacity[75] of 26.12 maf (32,220 mcm). Lake Mead ended water year 2023 at elevation 1,065.82 feet (324.86 meters) with 8.87 maf (10,940 mcm) in storage (34 percent of capacity) on September 30, 2023.

The total release from Lake Mead through Hoover Dam during water year 2023 was 7.63 maf (9,410 mcm). The total release from Lake Mead through Hoover Dam during calendar year 2023 is projected to be 7.77 maf (9,580 mcm).

The total inflow into Lake Mead is a combination of water released from Glen Canyon Dam plus inflows in the reach between Glen Canyon and Hoover Dams. In water year 2023, inflow into Lake Mead was 9.92 maf (12,240 mcm), consisting of 8.58 maf (10,580 mcm) of water released from Glen Canyon Dam and 1.34 maf (1,650 mcm) of inflows between Glen Canyon and Hoover Dams. For water year 2024, under the most probable inflow scenario, total inflow into Lake Mead is projected to be 8.27 maf (10,200 mcm).

Based on the August 2023 24-Month Study, Lake Mead's elevation on January 1, 2024 was projected to be 1,067.80 feet (325.47 meters). In accordance with Section 2.D.1 of the 2007 Interim Guidelines and the applicable provisions of the LB DCP Agreement, a Shortage Condition, consistent with Section 2.D.1.a of the 2007 Interim Guidelines, as well as Sections III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP Agreement, respectively, will govern the releases and diversions from Lake Mead in calendar year 2024. Releases from Lake Mead through Hoover Dam may also be adjusted for the creation and/or delivery of ICS, consistent with Section 3 of the 2007 Interim Guidelines and Sections III and IV of Exhibit 1 to the LB DCP Agreement, in calendar year 2024. In calendar year 2024, reservoir protection conservation will be implemented consistent with Section 2.E of the 2007 Interim Guidelines as amended in the 2024 Interim Guidelines SEIS ROD.

[74] Available online at: https://www.usbr.gov/lc/region/g4000/2021_MOU.pdf.

[75] Conservation capacity is the amount of space available for water storage between Lake Mead's water surface elevations 895.00 feet (272.80 meters) and 1,219.64 feet (371.75 meters), the start of the exclusive flood control space as defined in the Field Working Agreement Between Department of the Interior, Bureau of Reclamation and Department of the Army, Corps of Engineers for Flood Control of Hoover Dam and Lake Mead, Colorado River, Nevada-Arizona, February 8, 1984.

Under the most probable inflow scenario, Lake Mead is projected to end water year 2024 at elevation 1,060.29 feet (323.18 meters), with 8.45 maf (10,420 mcm) in storage (32 percent of capacity). Following the end of the water year, Lake Mead is projected to decline to elevation 1,059.16 feet (322.83 meters) with 8.36 maf (10,310 mcm) in storage (32 percent of capacity) at the end of calendar year 2024. The total release from Lake Mead through Hoover Dam during water year 2024 is projected to be 8.00 maf (9,870 mcm). The total release from Lake Mead through Hoover Dam during calendar year 2024 is projected to be 8.31 maf (10,250 mcm).

For the latest monthly projections for Lake Mead, please see the most recent 24-Month Study report available on Reclamation's Lower Colorado Region Water Operations website: https://www.usbr.gov/lc/region/g4000/24mo/index.html.

Lake Mohave and Lake Havasu

Lake Mohave started water year 2023 at an elevation of 639.17 feet (194.82 meters) with 1.60 maf (1,970 mcm) in storage. The water level of Lake Mohave was regulated between elevation 633.78 feet (193.18 meters) and 644.17 feet (196.34 meters) during the water year, ending at an elevation of 638.85 feet (194.72 meters), with 1.59 maf (1,960 mcm) in storage. During water year 2023, 7.32 maf (9,030 mcm) was released from Davis Dam. The calendar year 2023 total release is projected to be 7.25 maf (8,940 mcm).

For water and calendar years 2024, Davis Dam is projected to release nearly the same amount of water as in 2023, less any reductions in deliveries and adjustments for the creation and/or delivery of ICS and reservoir protection conservation actions. The water level in Lake Mohave will be regulated between an elevation of approximately 633.00 feet (192.94 meters) and 645.00 feet (196.60 meters).

Lake Havasu started water year 2023 at an elevation of 447.96 feet (136.54 meters) with 0.579 maf (714 mcm) in storage. The water level of Lake Havasu was regulated between elevation 447.06 feet (136.26 meters) and 448.36 feet (136.66 meters) during the water year, ending at an elevation of 448.12 feet (136.59 meters), with 0.582 maf (718 mcm) in storage. During water year 2023, 5.70 maf (7,030 mcm) was released from Parker Dam. The calendar year 2023 total release is projected to be 5.77 maf (7,120 mcm).

For water and calendar years 2024, Parker Dam is expected to release nearly the same amount of water as in 2023, less any reductions in deliveries and adjustments for the creation and/or delivery of ICS and reservoir protection conservation actions. The water level in Lake Havasu will be regulated between an elevation of approximately 446.00 feet (135.94 meters) and 450.00 feet (137.16 meters).

Lakes Mohave and Havasu are scheduled to be drawn down in the late summer and fall months to provide storage space for local storm runoff and will be filled in the winter to meet higher summer water needs. This drawdown also corresponds with normal maintenance at both Davis and Parker powerplants scheduled for October through May.

Bill Williams River

Alamo Lake elevation and storage increased during water year 2023. Alamo Lake started water year 2023 at elevation 1,110.24 feet (338.40 meters) with 0.091 maf (112 mcm) in storage and ended water year 2023 at elevation 1,126.02 feet (343.21 meters) with 0.143 maf (176 mcm) in storage.

In coordination with Reclamation and the Bill Williams River Corridor Steering Committee, the U.S. Army Corps of Engineers (USACE) released additional water to lower the elevation of Alamo Lake after recent flooding events. The additional release began on March 20, 2023, peaked at approximately 5,030 cfs (142 cms) on March 20, 2023. The USACE reduced the release to approximately 900 cfs (25.5 cms) on March 24, 2023 and began gradually decreasing the release to 300 cfs (8.49 cms) which they reached on May 15, 2023 and maintained until the completion of the release on June 14, 2023. Approximately 0.134 maf (165 mcm) of water was released from Alamo Lake from March 20 through June 14, 2023. Of this volume, approximately 0.108 maf (133 mcm) reached Lake Havasu.

Other than the period noted above, average daily releases from Alamo Lake in water year 2023 were about 25 cfs (0.71 cms). Water released from Alamo Lake totaled 0.147 maf (181 mcm) for water year 2023.

Senator Wash and Laguna Reservoirs

Senator Wash Reservoir is an off-stream regulating storage facility below Parker Dam (approximately 142 river miles downstream) and has a storage capacity of 0.014 maf (17 mcm) at full pool elevation of 251.00 feet (76.50 meters). The reservoir is used to store excess flows from the river caused by water user cutbacks, side wash inflows due to rain, and other factors. Stored waters are utilized to meet the water demands in Arizona and California and the delivery obligation to Mexico.

Since 1992, elevation restrictions have been in place on Senator Wash Reservoir due to potential piping and liquefaction of foundation and embankment materials at Xanyō Xamshré Dike and Senator Wash Dam. Senator Wash Reservoir is restricted to an elevation of 240.00 feet (73.15 meters) with 0.0090 maf (11 mcm) of storage, a loss of about 0.0050 maf (6.2 mcm) of storage from its original capacity. Whenever Senator Wash Reservoir exceeds an elevation of 237.00 feet (72.24 meters) Reclamation must conduct a visual inspection report. This reservoir restriction is expected to continue through 2024.

Laguna Reservoir is a regulating storage facility located approximately five river miles downstream of Imperial Dam and is primarily used to capture sluicing flows from Imperial Dam. The storage capability of Laguna Reservoir has diminished from about 0.0015 maf (1.9 mcm) to approximately 0.0004 maf (0.5 mcm) due to sediment accumulation and vegetation growth. Sediment accumulation in the reservoir has occurred primarily due to flood releases that occurred in 1983 and 1984, and flood control or space building releases that occurred between 1985 and 1988 and from 1997 through 1999.

Sediment removal at Laguna Reservoir to reestablish operational sluicing began in 2013;

however, the project was put on hold until a dredging project at Imperial Dam is completed. The revised estimated completion date is after 2024. In total, the Laguna Basin Dredging project will dredge approximately 3.55 million cubic yards (2.7 mcm) of sediment, reestablishing 140 acres (0.57 square kilometers) of open water. As of April 2023, approximately 2.72 million cubic yards (2.1 mcm) of material have been removed. All dredged material has been disposed of in a designated area adjacent to the project site. The project has incorporated the use of both land-based and waterborne heavy equipment. The project permit was obtained from the United States Army Corps of Engineers (USACE) in May 2013 and was valid through May 2020. The project permit from the USACE may be extended after the completion of the Imperial Dam dredging project.

Imperial Dam

Imperial Dam is the last major diversion dam on the Colorado River in the United States. From the head works at Imperial Dam, water is diverted into the All-American Canal on the California side of the dam and into the Gila Gravity Main Canal on the Arizona side of the dam. These diversions provide water to the Gila Project, the Yuma Project, the Imperial Irrigation District (IID), the Coachella Valley Water District, and the City of Yuma, and through Siphon Drop and Pilot Knob to the Northerly International Boundary (NIB) for diversion at Morelos Dam by Mexico. Flows arriving at Imperial Dam for calendar year 2023 are projected to be 5.53 maf (6,820 mcm). The flows arriving at Imperial Dam for calendar year 2024 are projected to be 5.30 maf (6,540 mcm).

Reclamation started a dredging project above Imperial Dam in March 2021. The purpose of this project is to remove sediment deposited immediately upstream of Imperial Dam that threatens to constrict and/or prevent the operation of Imperial Dam facilities. Large amounts of sediment deposits are detrimental to Imperial Dam water operations. Excessive sediment build up in the reservoir limits reservoir storage capacity and can impede gate operations. Periodic removal of sediment is necessary to allow delivery of water to the Gila Gravity Main Canal and the All-American canal. This project has been extended to remove an additional 0.300 million cubic yards (0.230 mcm) and is scheduled to be completed in 2025. As of September 2023, approximately 1.13 million cubic yards (0.864 mcm) of material have been removed. The project permit was obtained from the USACE and is valid through 2025.

Gila River Flows

During water year 2023, there was above average snowfall in the Gila River Basin, including the Salt and Verde River watersheds. The Salt River Project released water from its system in excess of diversion requirements at Granite Reef Diversion Dam in water year 2023 between March 2, 2023, and May 12, 2023. Water reached and was released from Painted Rock Dam by the USACE in water year 2023 between March 22, 2023, and June 9, 2023. Reclamation staff coordinated the operation of Painted Rock Dam with the U.S. Army Corps of Engineers such that the releases could be put to beneficial use at the confluence with the Colorado River. Approximately 0.329 maf (406 mcm) was released from Painted Rock Dam in water year 2023. Approximately 0.087 maf (107 mcm) reached the USGS gage at Dome, AZ and entered the Colorado River above the Northern International Boundary. Water arriving at the confluence of the mainstream Colorado River was able to be delivered and fulfill Mexico’s water use schedule.

Warren H. Brock Reservoir

The Warren H. Brock (Brock) Reservoir is located near the All-American Canal in Imperial County, California. The purpose of the 0.0080 maf (9.9 mcm) Brock Reservoir is to reduce non-storable flows and to enhance beneficial use of Colorado River water within the United States. The reservoir reduces the impact of loss of water storage at Senator Wash due to operational restrictions and provides additional regulatory storage, allowing for more efficient management of water below Parker Dam. In 2021, Reclamation completed the Warren H. Brock Reservoir Conservation Summary Report which includes, among other matters, a summary of water conserved by Brock Reservoir from 2013 through 2019.[76] Water conserved by Brock Reservoir from 2020 through 2022 may be found in the respective annual Colorado River Accounting and Water Use Report, Arizona, California, and Nevada.[77]

Yuma Desalting Plant

The Yuma Desalting Plant (YDP) was authorized in 1974 under the Colorado River Basin Salinity Control Act (Public Law 93-320)[78] which authorized the federal government to construct the YDP to desalt the drainage flows from the Wellton-Mohawk Division of the Gila Project. This would allow the treated water to be delivered to Mexico as part of its 1944 United States-Mexico Water Treaty allotment. The United States has met salinity requirements established in IBWC Minute No. 242 primarily through use of a canal to bypass Wellton-Mohawk drain water to the Ciénega de Santa Clara, a wetland of open water, vegetation, and mudflats within a Biosphere Reserve in Mexico. In calendar year 2023, the amount of water discharged from the Wellton-Mohawk Division through the bypass canal is anticipated to be 0.114 maf (140 mcm) measured at gaging station 0+00 and 0.118 maf (146 mcm) measured at the gaging station near the Southerly International Boundary (SIB), at an approximate concentration of total dissolved solids of 2,456 parts per million (ppm).

Off-stream Storage Agreements

Colorado River water may be stored off-stream pursuant to individual SIRAs and 43 CFR Part 414 within the Lower Division States. The Secretary shall make ICUA available to contractors in Arizona, California, or Nevada pursuant to individual SIRAs and 43 CFR Part 414. The Southern Nevada Water Authority (SNWA) may propose to make unused Nevada basic apportionment available for storage by the Metropolitan Water District of Southern California (MWD)[79] and/or Arizona Water Banking Authority (AWBA)[80] in calendar years 2023 and 2024.

[76] Available online at: https://www.usbr.gov/lc/region/programs/strategies/agreements/BrockReport.pdf.
[77] Available online at: https://www.usbr.gov/lc/region/g4000/wtracct.html.
[78] Available online at: https://www.usbr.gov/lc/region/pao/pdfiles/crbsalct.pdf.
[79] Storage and Interstate Release Agreement among The United States of America, acting through the Secretary of the Interior; The Metropolitan Water District of Southern California; the Southern Nevada Water Authority; and the Colorado River Commission of Nevada, October 21, 2004. Available online at: https://www.usbr.gov/lc/region/g4000/contracts/SNWA_MWDSIRAfinal.pdf.
[80] Storage and Interstate Release Agreement among The United States of America, acting through the Secretary of the Interior; The Arizona Water Banking Authority; the Southern Nevada Water Authority; and the Colorado River Commission of Nevada, December 18, 2002. Available online at: https://www.usbr.gov/lc/region/g4000/contracts/SIRAfinal.pdf.

Intentionally Created Surplus

The 2007 Interim Guidelines included the adoption of the ICS mechanism that, among other things, encourages the efficient use and management of Colorado River water in the Lower Basin. ICS may be created through several types of activities that include improvements in system efficiency, extraordinary conservation, tributary conservation, and the importation of non-Colorado River System water into the Colorado River mainstream over the course of a calendar year. Several implementing agreements[81] were executed concurrent with the issuance of the ROD for the 2007 Interim Guidelines. The LB DCP Agreement, as authorized by Public Law 116-14 through the 2019 Colorado River DCP, expanded upon the ICS concept, including the execution of additional implementation agreements[82] and establishment of a DCP ICS category. ICS credits may be created and delivered in calendar years 2023 and 2024 pursuant to Section 3 of the 2007 Interim Guidelines, Sections III and IV of Exhibit 1 to the LB DCP Agreement, including the ICS accumulation limit as outlined in Section IV.C of Exhibit 1 to the LB DCP Agreement, and other applicable implementing agreements. ICS balances by state, user, and type of ICS may be found in the annual Water Accounting Report.

IBWC Minute No. 323 identified cooperative measures that the United States and Mexico will take through December 31, 2026, including water conservation projects in Mexico. Consistent with Section IX.A of IBWC Minute No. 323, these water conservation projects will generate or conserve a volume of water of which 0.109 maf (135 mcm) will be converted to Binational ICS for use in the United States and 0.050 maf (62 mcm) will be allocated to the system for the benefit of all users.

Extraordinary Conservation ICS. Entities with approved plans may create Extraordinary Conservation ICS in 2023 and/or 2024. Table 5 provides a summary of anticipated, submitted, or approved Extraordinary Conservation ICS plans of creation in 2023 and 2024. Entities with available Extraordinary Conservation ICS may request delivery of ICS credits in 2023 and 2024.[83]

[81] Information on forbearance and delivery agreements related to the creation and delivery of ICS can be found at: https://www.usbr.gov/lc/region/programs/strategies/documents.html.
[82] Information on the agreements related to the creation of ICS under the LB DCP Agreement can be found at: https://www.usbr.gov/lc/region/programs/dcp.html.
[83] The ICS delivery volumes will be reflected in Reclamation's Water Accounting Report. The Water Accounting Report is available online at: https://www.usbr.gov/lc/region/g4000/wtracct.html.

Table 5. Summary of Extraordinary Conservation ICS Plans of Creation in Calendar Years 2023 and 2024

Entity	2023 Plan of Creation	Status of 2023 Plan	2024 Plan of Creation	Status of 2024 Plan
CAWCD	up to 0.100 maf (123 mcm)	approved	up to 0.100 maf (123 mcm)	approved
IID	up to 0.062 maf (76 mcm)	approved	up to 0.062 maf (76 mcm)	approved
MWD	up to 0.450 maf (555 mcm)	approved	up to 0.450 maf (555 mcm)	approved
SNWA	up to 0.100 maf (123 mcm)	approved	up to 0.100 maf (123 mcm)	approved

System Efficiency ICS. In 2023 and 2024, the Central Arizona Water Conservation District (CAWCD), MWD, and SNWA may request delivery of Brock Reservoir System Efficiency ICS credits. The annual maximum delivery of Brock Reservoir System Efficiency ICS is 0.065 maf (80 mcm). In 2023 and 2024, CAWCD, MWD, and SNWA may request delivery of YDP Pilot Run System Efficiency ICS credits.

Tributary Conservation ICS. SNWA has an approved plan to create up to 0.044 maf (54 mcm) of Tributary Conservation ICS in 2023 and has submitted a plan to create up to 0.044 maf (54 mcm) in 2024. Any Tributary Conservation ICS not delivered for use by SNWA in the calendar year created will, at the beginning of the following year, be converted to Extraordinary Conservation ICS pursuant to the 2007 Interim Guidelines.

Imported ICS. SNWA may submit plans to create Imported ICS in 2023 and 2024. Any Imported ICS not delivered for use by SNWA in the calendar year created will, at the beginning of the following year, be converted to Extraordinary Conservation ICS pursuant to the 2007 Interim Guidelines.

Binational ICS. In 2023 and 2024, CAWCD, IID, MWD, and SNWA may request delivery of Binational ICS subject to any applicable provisions in the delivery agreements.

DCP ICS. DCP ICS may be created in 2023 and 2024 by entities making DCP contributions consistent with Section III of Exhibit 1 to the LB DCP Agreement. Following creation, DCP ICS may be delivered in a subsequent year in accordance with Section III.F of Exhibit 1 to the LB DCP Agreement.

Delivery of Water to Mexico

2023 Operations. Delivery of water to Mexico pursuant to the 1944 United States-Mexico Water Treaty and IBWC Minute No. 323 is anticipated to be 1.383 maf (1,700 mcm) in calendar year 2023. This volume reflects a shortage reduction of 0.070 maf (86 mcm) pursuant to Section III.A of IBWC Minute No. 323, recoverable water savings of 0.030 maf (37 mcm) as required by Mexico under Section IV of IBWC Minute No. 323, and the creation of approximately 0.017 maf (21 mcm) of water for Mexico's Water Reserve pursuant to Section V of IBWC Minute No. 323, of which 0.004 maf (4.9 mcm) originated from water savings contributions. The water savings contribution volume shall be accounted for as described in the Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin (2019 Joint Engineers' Report)[84] and the Joint Report of the Principal Engineers with the Operational Provisions Applicable to Water for the Environment Stipulated in Minute 323 (2021 Joint Engineers' Report).[85] Balances of Mexico's Water Reserve in previous years may be found in the annual Colorado River Accounting and Water Use Report, Arizona, California, and Nevada.[86]

Of the scheduled delivery to Mexico in calendar year 2023, approximately 1.243 maf (1,530 mcm) is projected to be delivered at NIB and approximately 0.140 maf (173 mcm) is projected to be delivered at SIB. Under IBWC Minute No. 327 and the Emergency Delivery Agreement,[87] Mexico, through the IBWC, may request water to be delivered to Tijuana, Baja California, through MWD, the San Diego County Water Authority, and the Otay Water District's respective distribution system facilities in California. In calendar year 2023, approximately 2,961 acre-feet (3.7 mcm) is scheduled to be delivered to Tijuana, Baja California.

Of the total delivery at SIB projected in calendar year 2023, approximately 0.081 maf (100 mcm) is projected to be delivered from the Yuma Project Main Drain. No water is expected to be delivered by the Protective and Regulatory Pumping Unit (242 well field) in calendar year 2023.

Excess flows arriving at the NIB are anticipated to be approximately 0.056 maf (69 mcm) in calendar year 2023. Excess flows result from a combination of factors, including heavy rain from seasonal storms, water ordered but not delivered to United States users downstream of Parker Dam, inflows into the Colorado River below Parker Dam, releases from Painted Rock Dam, and spills from irrigation facilities below Imperial Dam.

[84] Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin. Available online at: https://ibwc.azurewebsites.net/wp-content/uploads/2023/04/Min323_joint_report_eng.pdf.
[85] Joint Report of the Principal Engineers with the Operational Provisions Applicable to Water for the Environment Stipulated in Minute 323. Available online at: https://www.ibwc.gov/wp-content/uploads/2023/04/Min323_joint_report_eng.pdf.
[86] Available online at: https://www.usbr.gov/lc/region/g4000/wtracct.html.
[87] Agreement for Temporary Emergency Delivery of a Portion of the Mexican Treaty Waters of the Colorado River to the International Boundary in the Vicinity of Tijuana, Baja California, Mexico, and for Operation of Facilities in the United States, dated February 8, 2022.

2024 Operations. Pursuant to the 1944 United States-Mexico Water Treaty and Section III.A of IBWC Minute No. 323, a volume of 1.45 maf (1,790 mcm) will be available to be scheduled for delivery to Mexico in calendar year 2024. This volume may be further adjusted for water savings contributions as required under Section IV of IBWC Minute No. 323 and system water and Mexico's Water Reserve conservation as required under Resolutions 1 and 2 of IBWC Minute No. 330. Mexico may create water for or take delivery of water from Mexico's Water Reserve pursuant to Section III.C and Section V of IBWC Minute No. 323 and Resolution 3 of IBWC Minute No. 330. Approximately 0.140 maf (173 mcm) is projected to be delivered at SIB and the remainder of the water to be scheduled for delivery to Mexico in 2024 will be delivered at NIB. Under IBWC Minute No. 327 and the Emergency Delivery Agreement, water may be delivered to Tijuana through MWD, the San Diego County Water Authority, and the Otay Water District's respective distribution system facilities in California.

Drainage flows to the Colorado River from the South Gila Drain Pump Outlet Channels and the Yuma Mesa Conduit are projected to be 0.029 maf (36 mcm) and 0.012 maf (15 mcm), respectively, for calendar year 2024. Consistent with Articles 11 and 15 of the 1944 United States-Mexico Water Treaty and IBWC Minute No. 242, this water is available for delivery at NIB in satisfaction of the 1944 United States-Mexico Water Treaty.

As stated in IBWC Minute No. 242, water delivered to Mexico upstream of Morelos Dam shall have an annual average salinity of no more than 115 ppm ± 30 ppm United States' count (121 ppm ± 30 ppm Mexican count) over the annual average salinity of Colorado River waters which arrive at Imperial Dam. This difference, known as the salinity differential, is projected to be 140 ppm by the United States' count for calendar year 2023.

Mexico has identified four critical months for agriculture, September through December, regarding improving the quality of water delivered at SIB. Consistent with Section VI.B of IBWC Minute No. 323, the United States has improved the water quality delivered at the SIB to approximately 1,200 ppm during this four-month period.

2024 DETERMINATIONS

The AOP provides projections regarding reservoir storage and release conditions during the upcoming year, based upon Congressionally mandated and authorized storage, release, and delivery criteria and determinations. After meeting these criteria and determinations, specific reservoir releases may be modified within these requirements as forecasted inflows change in response to climatic variability and to provide additional benefits coincident to the projects' multiple purposes.

Upper Basin

Section 602(a) of the CRBPA provides for the storage of Colorado River water in Upper Basin reservoirs and the release of water from Lake Powell that the Secretary finds reasonably necessary to assure deliveries to comply with Articles III(c), III(d), and III(e) of the 1922 Colorado River Compact without impairment to the annual consumptive use in the Upper Basin. The Operating Criteria provide that the annual plan of operation shall include a determination of the quantity of water considered necessary to be in Upper Basin storage at the end of the water year after taking into consideration all relevant factors including historic streamflow, the most critical period of record, the probabilities of water supply, and estimated future depletions. Water not required to be so stored will be released from Lake Powell:

- to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in Article III(e) of the 1922 Colorado River Compact, but these releases will not be made when the active storage in Lake Powell is less than the active storage in Lake Mead
- to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell
- to avoid anticipated spills from Lake Powell

Taking into consideration all relevant factors required by Section 602(a)(3) of the CRBPA and the Operating Criteria, it is determined that the active storage in Upper Basin reservoirs projected for September 30, 2024 under the most probable inflow scenario would be below the threshold required under Section 602(a) of the CRBPA.

Taking into account (1) the existing water storage conditions in the basin, (2) the August 2023 24-Month Study projection of the most probable near-term water supply conditions in the basin, and (3) Section 6.C.1 of the 2007 Interim Guidelines, the Mid-Elevation Release Tier will govern the operation of Lake Powell for water year 2024. The August 2023 24-Month Study of the most probable inflow scenario projects the water year 2024 release from Glen Canyon Dam to be 7.48 maf (9,230 mcm).

Lower Basin

Pursuant to Article III of the Operating Criteria and consistent with the Consolidated Decree, water shall be released or pumped from Lake Mead to meet the following requirements:

(a) 1944 United States-Mexico Water Treaty obligations;
(b) Reasonable beneficial consumptive use requirements of mainstream users in the Lower Division States;
(c) Net river losses;
(d) Net reservoir losses;
(e) Regulatory wastes; and
(f) Flood control.

The Operating Criteria provide that after the commencement of delivery of mainstream water by means of the Central Arizona Project, the Secretary will determine the extent to which the reasonable beneficial consumptive use requirements of mainstream users are met in the Lower Division States. Reasonable beneficial consumptive use requirements are met depending on whether a Normal, Surplus, or Shortage Condition has been determined. The Normal Condition is defined as annual pumping and release from Lake Mead sufficient to satisfy 7.50 maf (9,250 mcm) of consumptive use in accordance with Article III(3)(a) of the Operating Criteria and Article II(B)(1) of the Consolidated Decree. The Surplus Condition is defined as annual pumping and release from Lake Mead sufficient to satisfy in excess of 7.50 maf (9,250 mcm) of consumptive use in accordance with Article III(3)(b) of the Operating Criteria and Article II(B)(2) of the Consolidated Decree. An ICS Surplus Condition is defined as a year in which Lake Mead's elevation is projected to be above elevation 1,075.00 feet (327.66 meters) on January 1, a Flood Control Surplus has not been determined, and delivery of ICS has been requested. The Secretary may determine an ICS Surplus Condition in lieu of a Normal Condition or in addition to other operating conditions that are based solely on the elevation of Lake Mead. The Shortage Condition is defined as annual pumping and release from Lake Mead insufficient to satisfy 7.50 maf (9,250 mcm) of consumptive use in accordance with Article III(3)(c) of the Operating Criteria and Article II(B)(3) of the Consolidated Decree.

The 2007 Interim Guidelines are being utilized in calendar year 2024 and serve to implement the narrative provisions of Article III(3)(a), Article III(3)(b), and Article III(3)(c) of the Operating Criteria and Article II(B)(1), Article II(B)(2), and Article II(B)(3) of the Consolidated Decree for the period through 2026. The 2007 Interim Guidelines will be used annually by the Secretary to determine the quantity of water available for use within the Lower Division States.

Consistent with the 2007 Interim Guidelines and the LB DCP Agreement, the August 2023 24-Month Study was used to forecast the system storage as of January 1, 2024. Based on a projected January 1, 2024 Lake Mead elevation of 1,065.27 feet (324.69 meters) and consistent with Section 2.D.1 of the 2007 Interim Guidelines, a Shortage Condition, consistent with Section 2.D.1.a, will govern releases for use in the states of Arizona, Nevada, and California during calendar year 2024 in accordance with Article III(3)(c) of the Operating Criteria and Article II(B)(3) of the Consolidated Decree. In addition, consistent with Sections III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP Agreement, DCP contributions will be required by Arizona and Nevada, respectively, in calendar year 2024. Water deliveries in the Lower Basin

during calendar year 2024 will be limited to 7.167 maf (8,840 mcm) and will be further adjusted for DCP contributions and creation and/or delivery of ICS credits and/or DSS. In calendar year 2024, reservoir protection conservation will be implemented consistent with Section 2.E of the 2007 Interim Guidelines as amended by the 2024 Interim Guidelines SEIS ROD.

Article II(B)(6) of the Consolidated Decree allows the Secretary to allocate water that is apportioned to one Lower Division State but is for any reason unused in that state to another Lower Division State. This determination is made for one year only, and no rights to recurrent use of the water accrue to the state that receives the allocated water. No unused apportionment for calendar year 2024 is anticipated. If any unused apportionment becomes available after adoption of this AOP, Reclamation, on behalf of the Secretary, may allocate any such available unused apportionment for calendar year 2024 in accordance with Article II(B)(6) of the Consolidated Decree, the Unused Water Policy, and giving further consideration to the water conservation objectives of the July 30, 2014 agreement for the PSCP, the LC Conservation Program, as specified in Section 4.b of the LB DCP Agreement, and in accordance with Section 2.E of the 2007 Interim Guidelines as amended by the 2024 Interim Guidelines SEIS ROD.

In calendar year 2024, water may be stored off-stream pursuant to individual SIRAs and 43 CFR Part 414 within the Lower Division States. The Secretary shall make ICUA available to contractors in Arizona, California, or Nevada pursuant to individual SIRAs and 43 CFR Part 414. SNWA may propose to make unused Nevada basic apportionment available for storage by MWD and/or AWBA in calendar year 2024.

The IOPP, which became effective January 1, 2004, will be in effect during calendar year 2024. In accordance with Section 2.6.e of the IOPP, further accumulation of inadvertent overruns in calendar year 2024 will be suspended. Payback balances by state and user may be found in the annual Colorado River Accounting and Water Use Report, Arizona, California, and Nevada.[88]

In calendar year 2024, conserved Colorado River water, created through the PSCP, the LB DCP Agreement, the LC Conservation Program, and other voluntary agreements, is anticipated to be added to system reservoirs in the Lower Basin pursuant to system conservation agreements.

The 2007 Interim Guidelines included the adoption of the ICS mechanism, which was expanded upon in the LB DCP Agreement, that among other things encourages the efficient use and management of Colorado River water in the Lower Basin. In calendar year 2024, ICS credits will be created and delivered pursuant to Section 3 of the 2007 Interim Guidelines, Sections III and IV of Exhibit 1 to the LB DCP Agreement, and appropriate forbearance and delivery agreements, and consistent with approved ICS plans of creation.

Consistent with Section 4 of the 2007 Interim Guidelines, DSS may be created and delivered in calendar year 2024.

Given the limitation of available supply and recent low inflow amounts within the Colorado

[88] Available online at: https://www.usbr.gov/lc/region/g4000/wtracct.html.

River Basin, the Secretary, through Reclamation, will continue to review Lower Basin operations to assure that all deliveries and diversions of mainstream water are in strict accordance with the Consolidated Decree, applicable statutes, contracts, rules, and agreements.

As provided in Section 7.C of the 2007 Interim Guidelines, the Secretary may undertake a mid-year review to consider revisions of the current AOP. For Lake Mead, the Secretary shall revise the determination in any mid-year review for the current year only to allow for additional deliveries from Lake Mead pursuant to Section 7.C of the 2007 Interim Guidelines.

1944 United States-Mexico Water Treaty

Under the minimum probable, most probable, and maximum probable inflow scenarios, water in excess of that required to supply uses in the United States and the guaranteed quantity of 1.500 maf (1,850 mcm) allotted to Mexico will not be available, subject to any increased amounts delivered consistent with Section V of IBWC Minute No. 323. Vacant storage space in mainstream reservoirs is substantially greater than that required by flood control regulations.

A volume of 1.450 maf (1,790 mcm) of water will be available to be scheduled for delivery to Mexico during calendar year 2024 subject to and in accordance with Article 15 of the 1944 United States-Mexico Water Treaty, IBWC Minutes No. 242 and 327, and Section III.A of IBWC Minute No. 323. This volume may be further adjusted for water savings contributions as required under Section IV of IBWC Minute No. 323 and Resolutions 1 and 2 of IBWC Minute No. 330. In accordance with Section III.C and Section V of IBWC Minute No. 323 and Resolution 3 of IBWC Minute No. 330, Mexico may create water for or take delivery of water from Mexico's Water Reserve.

Calendar year schedules of the monthly deliveries of Colorado River water are formulated by the Mexican Section of the IBWC and presented to the United States Section before the beginning of each calendar year. Changes to these delivery schedules are coordinated between the United States and Mexican Sections of the IBWC pursuant to Article 15 of the 1944 United States-Mexico Water Treaty and consistent with other applicable agreements.

DISCLAIMER

Nothing in this AOP is intended to interpret the provisions of the Colorado River Compact (45 Stat. 1057); the Upper Colorado River Basin Compact (63 Stat. 31); the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Treaty Between the United States of America and Mexico (Treaty Series 994, 59 Stat. 1219); the United States/Mexico agreements in Minute No. 242 of August 30, 1973 (Treaty Series 7708; 24 UST 1968), Minute No. 323 of September 21, 2017, Minute No. 327 of January 28, 2022, or Minute No. 330 of March 21, 2024; the Consolidated Decree entered by the Supreme Court of the United States in *Arizona v. California* (547 U.S 150 (2006)); the Boulder Canyon Project Act (45 Stat. 1057; 43 U.S.C. 617); the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a); the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620); the Colorado River Basin Project Act (82 Stat. 885; 43 U.S.C. 1501); the Colorado River Basin Salinity Control Act (88 Stat. 266; 43 U.S.C. 1951); the Hoover Power Plant Act of 1984 (98 Stat. 1333); the Hoover Power Allocation Act of 2011 (125 Stat. 777); the Colorado River Floodway Protection Act (100 Stat. 1129; 43 U.S.C. 1600); the Grand Canyon Protection Act of 1992 (Title XVIII of Public Law 102-575, 106 Stat. 4669); the Decree Quantifying the Federal Reserved Right for Black Canyon of the Gunnison National Park (Case No. 01CW05, District Court, Colorado Water Division No. 4, 2008); the Colorado River Drought Contingency Plan Authorization Act (Public Law 116-14); or the rules, criteria, guidelines, and decisions referenced within this AOP.

ACRONYMS AND ABBREVIATIONS

500 Plus Plan	Memorandum of Understanding (MOU) to maintain the elevation in Lake Mead, signed December 15, 2021
1944 United States-Mexico Water Treaty	Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, the Treaty Between the United States of America and Mexico, signed February 3, 1944
2019 Joint Engineers' Report	Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin
2021 Joint Engineers' Report	Joint Report of the Principal Engineers with the Operational Provisions Applicable to Water for the Environment Stipulated in Minute 323
2023 Plan	2023 DROA Plan which spans from May 2023 through April 2024
2024 Interim Guidelines	Supplemental Environmental Impact Statement for Near Term
SEIS ROD	Colorado River Operations Record of Decision
AMWG	Glen Canyon Dam Adaptive Management Work Group
AOP	Annual Operating Plan
AWBA	Arizona Water Banking Authority
Brock	Warren H. Brock Reservoir
CAWCD	Central Arizona Water Conservation District
CBRFC	National Weather Service's Colorado Basin River Forecast Center
CFR	Code of Federal Regulations
cfs	cubic feet per second
cms	cubic meters per second
Consolidated Decree	Consolidated Decree of the Supreme Court of the United States in *Arizona v. California*, 547 U.S. 150
CPM	Colorado pikeminnow
CRBPA	Colorado River Basin Project Act of 1968
DCP	Drought Contingency Plan
DROA	Drought Response Operations Agreement
DSS	Developed Shortage Supply
FG-Ops	Flaming Gorge Operation Plan
IBWC	International Boundary and Water Commission
ICS	Intentionally Created Surplus
ICUA	Intentionally Created Unused Apportionment
IID	Imperial Irrigation District
IOPP	Inadvertent Overrun and Payback Policy
LB DCP Agreement	Lower Basin Drought Contingency Plan Agreement
LC Conservation Program	Lower Colorado River Basin System Conservation and Efficiency Program
LTEMP	Long-Term Experimental and Management Plan
LTSP	Larval Trigger Study Plan
maf	million acre-feet
mcm	million cubic meters
MOU	Memorandum of Understanding

MWD	The Metropolitan Water District of Southern California
NEPA	National Environmental Policy Act
NIB	Northerly International Boundary
Operating Criteria	Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968
ppm	parts per million
PSCP	Pilot System Conservation Program
Reclamation	Bureau of Reclamation
ROD	Record of Decision
Secretary	Secretary of the U.S. Department of the Interior
SEIS	Supplemental Environmental Impact Statement
SCPP	System Conservation Pilot Program
SIB	Southerly International Boundary
SIRA	Storage and Interstate Release Agreement
SJRIP	San Juan River Basin Recovery Implementation Program
SMB	Smallmouth bass
SNWA	Southern Nevada Water Authority
UCRC	Upper Colorado River Commission
UCRIP	Upper Colorado River Endangered Fish Recovery Program
Unused Water Policy	Lower Colorado Region Policy for Apportioned but Unused Water
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAPA	Western Area Power Administration
Water Accounting Report	Colorado River Accounting and Water Use Report, Arizona, California, and Nevada
YDP	Yuma Desalting Plant