



— BUREAU OF —
RECLAMATION

DRAFT Annual Operating Plan for Colorado River Reservoirs 2024

This draft document of the 2024 AOP is based upon the second consultation draft 2024 AOP. Edits, in red, indicate changes from the second consultation draft 2024 AOP. Operations in 2023 that have already been finalized will not appear in red.

Hydrologic projections in this draft document of the 2024 AOP are based on the October 2023 24-Month Study. Subsequent drafts will be updated with contemporary projections of hydrology.

Text and values highlighted in blue are provisional and subject to change.

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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 Decision¹ (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 Guidelines⁴ addressing operation of Hoover Dam, the 2006 Flaming Gorge Dam ROD,⁵ the 2006 Navajo Dam ROD⁶ 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 Minute No. 323 between the United States and Mexican Sections of the International Boundary and Water Commission (IBWC),¹⁰ and the agreements related to the 2019 Colorado River Drought Contingency Plans (DCPs)¹¹ as authorized by Public Law 116-14.¹² Each AOP incorporates these and other rules, guidelines, and decisions,

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/Files/Minutes/Min323.pdf>.

¹¹ 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>.

¹² 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>.

1 and reports on how the criteria contained in the applicable decision document or documents are
2 implemented. Thus, the AOP makes projections and reports on how the Bureau of Reclamation
3 (Reclamation) will implement these decisions in response to changing water supply conditions
4 as they unfold during the upcoming year, when conditions become known. Congress has
5 charged the Secretary of the Interior (Secretary) with stewardship and responsibility for a wide
6 range of natural, cultural, recreational, and tribal resources within the Colorado River Basin.
7 The Secretary has the authority to operate and maintain Reclamation facilities within the
8 Colorado River Basin addressed in this AOP to help manage these resources and accomplish
9 their protection and enhancement in a manner fully consistent with applicable provisions of
10 Federal law including the Law of the River, applicable provisions of State law, and other
11 project-specific operational limitations.

12
13 The Secretary recognized in the 2007 Interim Guidelines that the AOP provides an integrated
14 report on reservoir operations affected by numerous federal policies: *"The AOP is used to*
15 *memorialize operational decisions that are made pursuant to individual federal actions (e.g.,*
16 *ISG [the 2001 Interim Surplus Guidelines], 1996 Glen Canyon Dam ROD, this [2007 Interim*
17 *Guidelines] ROD). Thus, the AOP serves as a single, integrated reference document required*
18 *by section 602(b) of the CRBPA of 1968 [Colorado River Basin Project Act of September 30,*
19 *1968 (Public Law 90-537)]¹³ regarding past and anticipated operations."*

20 **Authority**

21 This 2024 AOP was developed in accordance with the processes set forth in: Section 602 of the
22 CRBPA; the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs
23 Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537)
24 (Operating Criteria), as amended, promulgated by the Secretary;¹⁴ and Section 1804(c)(3) of
25 the Grand Canyon Protection Act of 1992 (Public Law 102-575).¹⁵

26
27 Section 602(b) of the CRBPA requires the Secretary to prepare and *"transmit to the Congress*
28 *and to the Governors of the Colorado River Basin States a report describing the actual*
29 *operation under the adopted criteria [i.e., the Operating Criteria] for the preceding compact*
30 *water year and the projected operation for the current year."*

31
32 This AOP has been developed consistent with: the Operating Criteria; applicable Federal laws;
33 the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, the Treaty
34 Between the United States of America and Mexico, signed February 3, 1944 (1944 United
35 States-Mexico Water Treaty);¹⁶ interstate compacts; court decrees; the Colorado River Water
36 Delivery Agreement;¹⁷ the 2007 Interim Guidelines; the 2019 Colorado River DCP agreements;
37 and other documents relating to the use of the waters of the Colorado River, which are

¹³ Available online at: <https://www.usbr.gov/lc/region/pao/pdfiles/crbproj.pdf>.

¹⁴ Available online at: <https://www.usbr.gov/lc/region/g4000/lroc/frmar2905.pdf>.

¹⁵ Available online at: <https://www.usbr.gov/uc/legal/gcpa1992.pdf>.

¹⁶ Available online at: <https://www.ibwc.gov/Files/1944Treaty.pdf>.

¹⁷ 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>.

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. 242,¹⁸ 323, and 327,¹⁹ 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; and (5) 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 Decree of the Supreme Court of the United States in *Arizona v. California*, 547 U.S. 150 (2006) (Consolidated Decree).²⁰

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)).

¹⁸ 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/Files/Minutes/Min242.pdf>.

¹⁹ 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/Files/Minutes/Min327.pdf>.

²⁰ Available online at: <https://www.usbr.gov/lc/region/pao/pdf/scsconsolidateddecree2006.pdf>.

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

7 **Summary of Projected 2024 Operations**

8 **Upper Basin.** Taking into account (1) the existing water storage conditions in the basin, (2)
9 the August 2023 24-Month Study²¹ projection of the most probable near-term water supply
10 conditions in the basin, and (3) Section 6.C.1 of the 2007 Interim Guidelines, the Mid-
11 Elevation Release Tier will govern the operation of Lake Powell for water year 2024. The
12 August 2023 24-Month Study of the most probable inflow scenario projects the water year
13 2024 release from Glen Canyon Dam to be 7.48 million acre-feet (maf) (9,230 million cubic
14 meters [mcm]).

15
16 Reclamation will continue to monitor hydrologic and operational conditions and assess the
17 need for additional responsive actions and changes to operations. Reclamation will continue to
18 consult with the Basin States, Basin Tribes, the Republic of Mexico, and other partners on
19 Colorado River operations to consider future protective measures for both Lake Powell and
20 Lake Mead.

21
22 For further information about the variability of projected inflow into Lake Powell, see the 2024
23 Water Supply Assumptions section and the Lake Powell section within the Summary of
24 Reservoir Operations in 2023 and Projected 2024 Reservoir Operations, and Tables 3 and 4.

25
26 **Lower Basin.** Taking into account (1) the existing water storage conditions in the basin,
27 (2) the most probable near-term water supply conditions in the basin, and (3) Section 2.D.1 of
28 the 2007 Interim Guidelines, a Shortage Condition, consistent with Section 2.D.1.a, will govern
29 the operation of Lake Mead for calendar year 2024 in accordance with Article III(3)(c) of the
30 Operating Criteria and Article II(B)(3) of the Consolidated Decree. In addition, the Lower
31 Basin Drought Contingency Plan Agreement (LB DCP Agreement) will also govern the
32 operation of Lake Mead for calendar year 2024. Consistent with Sections III.B.1.a and III.B.2.a
33 of Exhibit 1 to the LB DCP Agreement, DCP contributions will be required by Arizona and
34 Nevada, respectively, in calendar year 2024. Creation and/or delivery of Intentionally Created
35 Surplus (ICS) may be made consistent with Section 3 of the 2007 Interim Guidelines and
36 Sections III and IV of Exhibit 1 to the LB DCP Agreement, as applicable.

37
38 No unused apportionment for calendar year 2024 is anticipated. If any unused apportionment
39 becomes available after adoption of this AOP, Reclamation, on behalf of the Secretary, may
40 allocate any such available unused apportionment for calendar year 2024. Any such allocation

²¹ 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>.

1 shall be made in accordance with Article II(B)(6) of the Consolidated Decree, the Lower
2 Colorado Region Policy for Apportioned but Unused Water (Unused Water Policy),²² and
3 giving further consideration to the water conservation objectives of the July 30, 2014
4 agreement for a pilot system conservation program (PSCP),²³ the Lower Colorado River Basin
5 System Conservation and Efficiency Program (LC Conservation Program),²⁴ and as specified
6 in Section 4.b of the LB DCP Agreement.

7
8 In calendar year 2024, Colorado River water may be stored off-stream pursuant to individual
9 Storage and Interstate Release Agreements (SIRAs) and 43 CFR Part 414 within the Lower
10 Division States. The Secretary shall make Intentionally Created Unused Apportionment
11 (ICUA) available to contractors in Arizona, California, or Nevada pursuant to individual SIRAs
12 and 43 CFR Part 414.

13
14 The Inadvertent Overrun and Payback Policy (IOPP),²⁵ which became effective January 1,
15 2004, will not be in effect during calendar year 2024 because overruns are not permitted in a
16 Shortage Condition. In accordance with Section 2.6.e of the IOPP, further accumulation of
17 inadvertent overruns in calendar year 2024 will be suspended.

18
19 Conserved Colorado River water, created through the PSCP,²⁶ the LB DCP Agreement, the LC
20 Conservation Program, and other voluntary agreements, is anticipated to be added to Lower
21 Basin reservoirs pursuant to system conservation agreements in the Lower Basin in calendar
22 year 2024.

23
24 The 2007 Interim Guidelines adopted the ICS mechanism, which was expanded upon in the LB
25 DCP Agreement, that among other things encourages the efficient use and management of
26 Colorado River water in the Lower Basin. ICS may be created and delivered in calendar year
27 2024 pursuant to the 2007 Interim Guidelines, the LB DCP Agreement, and applicable
28 forbearance and delivery agreements, and ~~the LB DCP Agreement~~ consistent with approved ICS
29 plans of creation.

30
31 Consistent with Section 4 of the 2007 Interim Guidelines, Developed Shortage Supply (DSS)
32 may be created and delivered in calendar year 2024.

33
34 **1944 United States-Mexico Water Treaty.** A volume of 1.450 maf (1,790 mcm) of water will
35 be available to be scheduled for delivery to Mexico during calendar year 2024 in accordance
36 with Article 15 of the 1944 United States-Mexico Water Treaty, IBWC Minutes No. 242 and
37 327, and Section III.A of IBWC Minute No. 323. The volume delivered may also be adjusted

²² Lower Colorado Region Policy for Apportioned but Unused Water, February 11, 2010. Available online at:
<https://www.usbr.gov/lc/region/g4000/UnusedWaterPolicy.pdf>.

²³ Available online at:

<https://www.usbr.gov/lc/region/programs/PilotSysConsProg/PilotSCPFundingAgreement7-30-2014.pdf>.

²⁴ More information on the LC Conservation Program: <https://www.usbr.gov/lc/LCBConservation.html>.

²⁵ 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.

²⁶ More information about the PSCP in the Lower Basin can be found at:

<https://www.usbr.gov/lc/region/programs/PilotSysConsProg/pilotsystem.html>.

for water savings contributions as required under Section IV of IBWC Minute No. 323. 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.

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.²⁷ 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, Minute No. 323, and the 2019 Colorado River DCP agreements.

Upper Basin Drought Response Operations Agreement (DROA)

Reclamation staff have worked with the DROA²⁸ 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 ~~operational~~-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 WAPA,²⁹ 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

²⁷ 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>

²⁸ Available online at: <https://www.usbr.gov/dcp/docs/final/Attachment-A1-Drought-Response%20Operations-Agreement-Final.pdf>.

²⁹ 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.

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 the duration of May 2022 through April 2023.³⁰ The Secretary of the Interior through her designee approved the 2022 Plan on April 29, 2022.³¹ The 2022 DROA Planas summarized below included and including 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 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

³⁰ Drought Response Operations Framework and Plan: <https://www.usbr.gov/uc/DocLibrary/Plans/20220420-2022DroughtResponseOperationsPlan-Signed-508-UCRO.pdf>.

³¹ Department of Interior Approval Memo: <https://www.usbr.gov/uc/DocLibrary/Plans/20220429-2022DroughtResponseOperationsPlan-ApprovalMemo-508-DOI.pdf>.

1 Flaming Gorge through the end of DROA year 2022 and was able to successfully recover 0.135
2 maf (167 mcm) of DROA releases in March and April of 2023.³²

3 **2022 Powell Release Reduction; Operational Neutrality and Protection of the** 4 **Glen Canyon Dam Facilities and Operations**

5 In light of the prolonged drought, low runoff conditions, and depleted storage at Lake Powell,
6 the Department of the Interior, in consultation with the Basin States and others, implemented an
7 action under Sections 6 and 7.D of the 2007 Interim Guidelines specifically reducing the Glen
8 Canyon Dam annual release from 7.48 maf (9,230 mcm) to 7.00 maf (8,630 mcm) in water year
9 2022 to protect crucial water delivery and water management infrastructure at Glen Canyon
10 Dam. This action, based on the May 3rd Letter, was undertaken in conjunction consultation with
11 the Basin States and Basin Tribes. The separate but related with 2022 DROA actions resulted
12 resulting in adding approximately one million additional acre-feet (1,230 mcm) of storage, or
13 16.00 feet (4.88 meters) of pool elevation, by April 2023 in Lake Powell.

14
15 Beginning with the April 2023 24-Month Study, Reclamation removed the operational
16 neutrality, as defined in the May 2022 letter, of the 0.480 maf (592 mcm) that was retained in
17 Lake Powell under the May 2022 action,³³ such that balancing releases are based on the
18 physical storages of Lake Powell and Lake Mead, but could be as low as 7.00 maf (8,630 mcm)
19 and as high as 9.50 maf (11,720 mcm) consistent with the Interim Guidelines and to protect
20 Lake Powell from declining below elevation 3,525.00 feet (1,074.42 meters) at the end of
21 December 2023.

22 **2023 DROA Plan**

23 On May 26, 2023, the DROA Parties agreed to the 2023 Plan. The 2023 Plan reflects the
24 impact of much above average Colorado River inflows in water year 2023 and does not include
25 any DROA releases, but rather provides for recovery of prior DROA releases from the units
26 upstream of Powell.³⁴ The Secretary of the Interior through her designee approved the 2023
27 Plan, as summarized in the following key operational elements:

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

34 **Supplemental Environmental Impact Statement (SEIS)**

35 As directed by the Secretary, on November 17, 2022, Reclamation published a Federal Register
36 Notice indicating its intent to prepare a SEIS.³⁵ The purpose of the SEIS is to supplement the

³² For more information regarding DROA accounting: <https://www.usbr.gov/dcp/DROSummarySheet.pdf>

³³ For more information: <https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf>.

³⁴ The 2023 DROA Plan is available online at: <https://www.usbr.gov/dcp/droa.html>.

³⁵ 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>.

1 Environmental Impact Statement completed in 2007 for the 2007 Interim Guidelines in order to
2 modify operating guidelines for the operation of Glen Canyon and Hoover Dam to address the
3 historic drought and low runoff conditions in the Colorado River Basin through 2026. The need
4 for the revised operating guidelines is based on the potential that continued low runoff
5 conditions in the Colorado River Basin could lead to critically low reservoir conditions at Lake
6 Powell and Lake Mead that impact both water delivery and hydropower operations from
7 2023 through ~~and~~ 2026⁴.
8

9 Reclamation published the draft SEIS on April 14, 2023. The 45-day public commenting period
10 was scheduled to end on May 30, 2023; however, an additional action alternative was
11 submitted to Reclamation for consideration prior to the closing date by the Lower Division
12 States.³⁶ With the submission of this proposed alternative, Reclamation withdrew the draft
13 SEIS on May 24, 2023 and is currently analyzing the effects of the proposal under the National
14 Environmental Policy Act (NEPA). Reclamation will publish a new draft SEIS for public
15 comment that will include the proposal as an action alternative. It is premature at this time to
16 identify any potential changes to Glen Canyon Dam or Hoover Dam operations. Any potential
17 changes to such operations may be adopted and implemented in 2024 through 2026. ~~and/or~~
18 subsequent years.

19 System Conservation

20 System conservation agreements have allowed water users to participate in projects designed to
21 determine whether voluntary, temporary, and compensated programs to conserve or reduce
22 consumptive use of Colorado River water can benefit the entire Colorado River system by
23 mitigating the effect on declining storage levels in Colorado River reservoirs.^{37,38} Agreements
24 previously executed under the PSCP in the Lower Basin continue to be implemented in 2023
25 and 2024.³⁹
26

27 Consistent with the Secretary's efforts to create or conserve 0.100 maf (123 mcm) or more of
28 Colorado River system water annually in the Lower Basin under the LB DCP Agreement and
29 the additional conservation goals under the 500 Plus Plan MOU, Reclamation and the MOU
30 parties have entered into agreements to create system conservation water consistent with these
31 two agreements. As of June 2023, efforts under the 500 Plus Plan have concluded. A summary
32 accounting of water conserved is in progress.
33
34
35

³⁶ Information regarding the SEIS is available online at: <https://www.usbr.gov/ColoradoRiverBasin/SEIS.html>.

³⁷ 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.ucrccommission.com/ucrc-provides-scpp-status-update/>

³⁸ 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

³⁹ More information on the PSCP in the Lower Basin can be found online at: <https://www.usbr.gov/lc/region/programs/PilotSysConsProg/pilotsystem.html>

UC Conversation Program

In December 2022, Congress authorized the System Conservation Pilot Program (SCPP) in the Upper Division States.³⁷ 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 af of system water is being conserved in 2023. The Upper Division States acting through the UCRC are implementing an additional SCPP effort in 2024 in partnership with Reclamation.

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 Program⁴⁰ 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.⁴¹

Additional projects or agreements to create or conserve system water in the Lower Basin may also be implemented in calendar years 2023 and/or 2024.

⁴⁰ More information on the LC Conservation Program can be found online at:
<https://www.usbr.gov/lc/LCBConservation.html>.

⁴¹ Draft summary table of executed agreements is available online at:
https://www.usbr.gov/lc/region/programs/LCBConservation&EfficiencyProgram/System_Conservation_Implementation_Agreements.pdf.

2023 HYDROLOGY SUMMARY AND RESERVOIR STATUS

Much above average streamflow⁴² was observed throughout much of the Colorado River Basin during water year 2023. Unregulated⁴³ inflow to Lake Powell in water year 2023 was 13.42 maf (16,550 mcm), or 140 percent of the 30-year average⁴⁴ 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 average⁴⁵ 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.

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.

⁴² Streamflow statistics throughout this document are provided by the National Weather Service's Colorado Basin River Forecast Center 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.

⁴³ 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.

⁴⁴ Inflow statistics throughout this document will be compared to the mean of the 30-year period 1991-2020, unless otherwise noted.

⁴⁵ 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.

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).⁴⁶

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	Live Storage	Water Elevation	Percent of Capacity	Change in Storage	Change in Elevation
	(maf)	(maf)	(ft)	(%)	(maf)	(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	

⁴⁶ 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.

1

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	

2

2024 WATER SUPPLY ASSUMPTIONS

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

6

There is considerable uncertainty associated with streamflow forecasts and projections of reservoir operations made a year in advance. The National Weather Service's Colorado Basin River Forecast Center (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:

13

- 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.

20

1 Projected unregulated inflow volumes⁴⁷ into Lake Powell for specific time periods for these
2 three forecasted inflow scenarios are shown in Tables 3 and 4.

3
4 Inflows to the mainstream from Lake Powell to Lake Mead, Lake Mead to Lake Mohave, Lake
5 Mohave to Lake Havasu, and below Lake Havasu are projected using historic data over the
6 five-year period of January 2018 through December 2022, inclusive. These five years of
7 historic data are representative of the most recent hydrologic conditions in the Lower Basin.
8 The most probable side inflows into each reach are estimated as the arithmetic mean of the
9 five-year record. The maximum probable and minimum probable projections for each reach are
10 the 10 percent and 90 percent exceedance values, respectively, of the five-year record. For the
11 reach from Lake Powell to Lake Mead, the minimum probable inflow during water year 2024 is
12 0.634 maf (782 mcm), the most probable inflow is 0.786 maf (970 mcm), and the maximum
13 probable inflow is 0.972 maf (1,200 mcm).

14
15 The projected monthly volumes of inflow were input into the 24-Month Study and used to
16 project potential reservoir operations for 2024. Starting with the August 2023 24-Month Study
17 projection of the October 1, 2024 reservoir storage conditions, the projected monthly releases
18 for each reservoir were adjusted until release and storage levels best accomplished project
19 purposes and applicable operational objectives.

20
21 For the latest monthly projections for the major reservoirs in the Colorado River system, please
22 see the most recent 24-Month Study report available on these Reclamation websites:

23
24 <https://www.usbr.gov/uc/water/crsp/studies/index.html>, or
25 <https://www.usbr.gov/lc/region/g4000/24mo/index.html>.

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⁴⁷ 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>.

1 **Table 3. Projected Unregulated Inflow into Lake Powell for Water Year 2024 (English Units)⁴⁸**

Time Period	Minimum Probable (maf)	Most Probable (maf)	Maximum Probable (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

2

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

Time Period	Minimum Probable (mcm)	Most Probable (mcm)	Maximum Probable (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

4

5

⁴⁸ 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 Minimum and Maximum Probable 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)⁴⁹ 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),⁵⁰ the San Juan River Basin Recovery Implementation Program (SJ RIP),⁵¹ 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

⁴⁹ Information on the AMWG can be found at: <https://www.usbr.gov/uc/progact/amp/amwg.html>.

⁵⁰ Information on the UCRIP can be found at: <http://coloradoriverrecovery.org>.

⁵¹ Information on the SJ RIP 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.

1 A 2023 Plan⁵² was approved by the Upper Division States, the Upper Colorado River
2 Commission, and the Department of the Interior. The 2023 Plan emphasizes recovery of prior
3 DROA releases totaling 0.588 maf (725 mcm) from Flaming Gorge.

4
5 The Flaming Gorge Operation Plan for May 2023 through April 2024 (FG-Ops) has been
6 developed and approved by Reclamation pursuant to the 2006 Flaming Gorge ROD and
7 includes the 2023 Plan. The FG-Ops outlines UCRIP flow requests for the average, moderately
8 wet, and wet hydrologic classifications.⁵³ The average scenario includes the Larval Trigger
9 Study Plan (LTSP) spring release (spring release based on a biological trigger)⁵⁴ and an
10 optional smallmouth bass (SMB) flow spike (to disrupt the spawning success of non-native
11 smallmouth bass),⁵⁵ pending hydrology and water temperature. Experiments that are outlined in
12 the FG-Ops Plan implement flow ranges and targets from LaGory et al. (2019).⁵⁶ After much
13 consideration, the Flaming Gorge Technical Working Group representatives, Colorado River
14 Recovery Program, and subject matter experts agreed that the smallmouth bass spike flow
15 experiment will-would not be recommended this operational year. This was due to potential
16 negative impacts to the endangered Colorado pikeminnow (CPM).

17
18 LTSP spring releases were timed with a biological trigger. After public notification, releases
19 from Flaming Gorge Dam were increased to the full powerplant capacity of 4,600 cfs (130
20 cms) and the full bypass capacity of 4,000 cfs (113 cms) on June 8, 2023 for four days then
21 ramped down by 2,000 cfs/day (56.6 cms/day) to 900 cfs (25.5 cms).⁵⁶ Yampa River flows at
22 the Deerlodge gage during the spring peak releases peaked at 20,100 cfs (569 cms) on May 18,
23 2023. The peak release from Flaming Gorge Dam occurred after the Yampa River peak. Flows
24 measured on the Green River at the Jensen, Utah gage reached levels at or above 18,600 cfs
25 (526 cms) for 8 days in May and June, 2023, with an average daily peak of 20,100 cfs (569
26 cms) on May 19, 2023. The spring peak release in Reach 2 for this hydrologic classification is
27 greater than or equal to 18,600 cfs (526 cms) for 8 days.

28
29 In water year 2023, Flaming Gorge Reservoir was operated in accordance with the 2006
30 Flaming Gorge ROD. Water year 2023 winter base flow releases ranged from 1,700 cfs (48.1

⁵² Drought Response Operations Framework and Plan: <https://www.usbr.gov/dcp/docs/DROA/20230517-2023DROAPlan-508-UCRO.pdf>

⁵³ 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>

⁵⁴ 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>.

⁵⁵ 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>.

⁵⁶ 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.

1 cms) to approximately 1,750 cfs (49.5 cms). The April through July observed unregulated
2 inflow resulted in an initial hydrologic classification of moderately wet ~~hydrologic~~for the
3 summer baseflow period and a classification. A moderately wet hydrologic operation was
4 conducted for the month of August. The August observed unregulated inflow was 0.095 maf
5 (117 mcm), a 39 percent exceedance value, and within the average hydrologic classification
6 range. Due to February 2024 end of month calculations and the August observed unregulated
7 inflow, an average hydrologic classification will be targeted for the remainder of the baseflow
8 period. The hydrologic classification for the baseflow period is subject to change pending
9 hydrologic conditions. The August ~~These~~ releases are within the 2000 Flow and Temperature
10 Recommendations range of 2,400 cfs (67.9 cms) to 2,800 cfs (79.2 cms) at Reach 2 including
11 being within the +/-40 percent range flexibility. The September releases are within the 2000
12 Flow and Temperature Recommendations range of 1,500 cfs (42.4 cms) to 2,400 cfs (67.9 cms)
13 at Reach 2. To meet CPM flow targets in August and September the flow range specified for
14 CPM in LaGory et al. (2019)^{56,57} were achieved in Reach 2 for a moderately wet and average
15 hydrologic classification. Summer base flow average daily releases ranged from 900 cfs (25.5
16 cms) to 1,960 cfs (55.5 cms).

17
18 A spring peak release is projected to occur in May or June 2024 and will be timed to coincide
19 with either the peak flows of the Yampa River or emergence of razorback sucker larvae.
20 Reclamation is considering long-term implementation strategies for the UCRIP LTSP.

21
22 Based on the August 2023 24-Month Study, the most probable April through July unregulated
23 inflow scenario for Flaming Gorge Reservoir during water year 2024 is 0.920 maf (1,130
24 mcm), or 95 percent of average. The peak elevation is expected to be approximately 6,032.18
25 feet (1,838.61 meters) near mid-July 2024. By the end of water year 2024, Flaming Gorge
26 Reservoir is projected to be at elevation 6,030.62 feet (1,838.13 meters), with a storage of 3.29
27 maf (4,060 mcm), or 90 percent of live capacity.

28
29 Under the minimum probable 2024 April through July inflow forecast of 0.587 maf (724 mcm),
30 a 4,600 cfs (130 cms) 2024 spring peak release will be implemented. Under the maximum
31 probable 2024 April through July inflow forecast of 1.70 maf (2,100 mcm), an 8,600 cfs (243
32 cms) spring peak release will be implemented.

33
34 The UCRIP, in coordination with Reclamation, USFWS, and WAPA, will continue conducting
35 studies associated with floodplain inundation. Such studies may result in alternatives for
36 meeting flow and temperature recommendations at lower peak flow levels where feasible.

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

38 Reservoir storage content in Blue Mesa increased during water year 2023. At the beginning of
39 water year 2023, Blue Mesa storage content was 35 percent of live capacity at elevation
40 7,446.72 feet (2,269.76 meters), with 0.292 maf (360 mcm) in storage. The unregulated inflow

⁵⁷ 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.

1 to Blue Mesa during water year 2023 was 1.06 maf (1,310 mcm), which was 117 percent of
2 average. At the end of the water year, Blue Mesa storage content was 76 percent of live
3 capacity at elevation 7,496.50 feet (2,284.93 meters), with 0.629 maf (776 mcm) resulting in a
4 net increase during water year 2023 of 0.337 maf (416 mcm).

5
6 A 2023 DROA Plan was approved by the Upper Division States, the Upper Colorado River
7 Commission, and the Department of the Interior. The 2023 Plan emphasizes recovery of prior
8 DROA releases totaling 0.036 maf (44 mcm) from Blue Mesa.

9
10 Above average snowpack conditions occurred during the winter months of water year 2023 in
11 the Gunnison River Basin. Snow measurement sites in the basin reported above median
12 seasonal snow water equivalent levels throughout the winter and into the spring of 2023
13 resulting in an April 1, 2023 snow water equivalent for the Gunnison River Basin that was 164
14 percent of median, using the 1991-2020 hydrologic period of record.

15
16 The fall-through-winter releases from Crystal Dam were consistently near 350 cfs (9.90 cms)
17 after the Gunnison Tunnel ended diversions for irrigation season on November 1, 2022. On
18 April 3, 2023, releases from Crystal Dam were increased for the 2023 irrigation season as
19 operation of the Gunnison Tunnel began diverting 200 cfs (5.66 cms). Flows through the Black
20 Canyon were maintained within the range of approximately 350 cfs (9.90 cms) to
21 approximately 800 cfs (22.6 cms) until May 12, 2023. The May 2023 final forecast⁵⁸ for the
22 unregulated inflow to Blue Mesa for the April through July runoff period was 0.830 maf (1,020
23 mcm), which was 130 percent of average. This forecast was used to establish the hydrologic
24 category for water year 2023 as average wet with a peak flow target established for the
25 Gunnison River of 14,350 cfs (408 cms) for 2 days and 8,070 cfs (228 cms) for 20 days as
26 measured at the Gunnison River near Grand Junction, CO streamgage (Whitewater gage).⁵⁹

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

33 By May 18, 2023, flows in the Gunnison River near Delta approached a level that was
34 concerning to the operators of the Delta wastewater treatment plant (13,000 cfs (368 cms)). Due
35 to the concerns with the Delta wastewater treatment plant and additional high water concerns in
36 Delta County, Reclamation halted the ramp up schedule and held releases steady to keep flows
37 below 13,000 cfs (368 cms) at Delta. On May 22, 2023, a down ramp was scheduled to return
38 releases to full powerplant capacity (approximately 1,990 cfs (56.3 cms)) from Crystal
39 Reservoir, which was achieved on May 26, 2023. During spring peak operations, flows in the
40 Gunnison River as measured at the Whitewater gage achieved an average daily peak flow of

⁵⁸ 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.

⁵⁹ Link to the Gunnison River near Grand Junction, CO USGS gage: <https://waterdata.usgs.gov/monitoring-location/09152500/#parameterCode=00065&period=P7D>

1 above 14,350 cfs (408 cms) for four days on May 17-20, 2023, reaching 17,400 cfs (492 cms)
2 on May 18, 2023.

3
4 As noted, due to high downstream tributary inflow, originally planned releases from the
5 Aspinall Unit were not needed to reach earlier projections of ROD objectives. Flows in the
6 Gunnison River measured at the Whitewater gage achieved an average daily flow of above
7 8,070 cfs (228 cms) for 32 days. These flows doubled the target downstream peak flow
8 durations described in the Aspinall ROD and exceeded the downstream half bank flow levels
9 and durations described in the Aspinall ROD by twelve days. Flow in the Black Canyon during
10 this time peaked on May 18, 2023, at 4,650 cfs (135 cms).

11
12 On June 1, 2023, Reclamation determined that a de-synchronized peak of 6,400 cfs (181 cms)
13 would be targeted pursuant to Section 32.4.4 of the Black Canyon Water Right Decree, which
14 states that to the extent practicable, the Black Canyon Water Right target peak flow shall be
15 coordinated with releases made pursuant to the ROD to achieve a single peak flow, subject to
16 section 32.2.2 (flood prevention). but permits a de-synchronized peak flow to reduce the
17 potential for downstream flooding. On June 21, 2023, releases increased from the Aspinall Unit
18 to ramp up to a total release rate of 7,297 cfs (206 cms) for 24 consecutive hours, which
19 occurred on June 28, 2023. The 24-hour peak flow in the Black Canyon was 7,404 cfs (210
20 cms) which occurred on June 27-28, 2023.

21
22 Following this action, releases were gradually reduced until July 8, 2023, when bypass releases
23 at Crystal were terminated and all releases were made through the Crystal powerplant. The
24 peak elevation at Blue Mesa was achieved on June 25, 2023 when the elevation was 7,512.47
25 feet (2,289.80 meters) with a corresponding storage of 0.765 acre-feet (944 mcm) or 92 percent
26 of capacity.

27
28 For water year 2024, the Aspinall Unit will be operated in compliance with the 2012 Aspinall
29 ROD, including all required consultations and consistent with applicable law, while
30 maintaining and continuing to meet its Congressionally authorized purposes.

31
32 Based on the August 2023 24-Month Study, the projected most probable unregulated inflow for
33 water year 2024 into Blue Mesa Reservoir is 0.895 maf (1,100 mcm), or 99 percent of average.
34 The reservoir is expected to reach a seasonal low elevation of 7,487.45 feet (2,228.17 meters)
35 in March 2024. The peak elevation is expected to be approximately 7,508.79 feet (2,288.68
36 meters) near the end of July 2024. By the end of water year 2024, Blue Mesa Reservoir is
37 projected to be at elevation 7,500.21 feet (2,286.06 meters), with a storage content of 0.660 maf
38 (814 mcm), or 80 percent of capacity.

39
40 Under the minimum probable 2024 April through July inflow forecast of 0.378 maf (466 mcm),
41 there will be 1-day spring peak release during the spring of 2024. Under the maximum probable
42 2024 April through July inflow forecast of 0.932 maf (1,150 mcm), a 10-day spring peak
43 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 inflow⁶⁰ 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,⁶¹ 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

⁶⁰ 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.

⁶¹ 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.

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. 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,⁶² such that balancing releases in water year 2023 were based on physical elevations-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 ~~in~~ water year 2023, release from Lake Powell ~~was released~~ 8.58 maf (10,580 mcm).

⁶² For more information: <https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf>.

1 The April through July unregulated inflow to Lake Powell in water year 2023 was 10.62 maf
2 (13,100 mcm) which was 166 percent of average. During the 2023 April through July runoff
3 period, Lake Powell's water surface elevation peaked on July 3, 2023, at 3,584.68 feet
4 (1,092.61 meters), which was 115.32 feet (35.15 meters) below full pool. This elevation
5 corresponds to a live storage content of 9.67 maf (11,930 mcm).
6

7 In water year 2023, Glen Canyon Dam was operated in compliance with the LTEMP ROD.
8

9 In April 2023, Reclamation conducted a high flow experimental release from Glen Canyon
10 Dam, consistent with the LTEMP and related compliance documents.⁶³ Reclamation released
11 the maximum available capacity of 38,800 cfs (1,100 cms) during the experiment which was
12 conducted beginning on April 24 and ending on April 27, 2023. Approximately 0.090 maf (111
13 mcm) was bypassed during the experiment. The total April 2023 monthly release and annual
14 release from Glen Canyon Dam in water year 2023 did not change as a result of the
15 experimental releases.
16

17 The ten-year total flow of the Colorado River at Lee Ferry⁶⁴ for water years 2014 through 2023
18 is 86.08 maf (106,180 mcm). This total is computed as the sum of the flow of the Colorado
19 River at Lees Ferry, Arizona, and the Paria River at Lees Ferry, Arizona, surface water
20 discharge stations which are operated and maintained by the United States Geological Survey.
21

22 **2024 Operating Tier and Projected Operations for Glen Canyon Dam.**

23 The January 1, 2024 reservoir elevations of Lake Powell and Lake Mead are projected under
24 the most probable inflow scenario, with an 8.23 maf (10,150 mcm) release pattern in water year
25 2024, to be 3,568.57 feet (1,087.70 meters) and 1,070.27 feet (326.22 meters), respectively,
26 based on the August 2023 24-Month Study. Given these projections, the operating tier and
27 annual release volume from Lake Powell during water year 2024 will be consistent with the
28 Mid-Elevation Release Tier (Section 6.C.1 of the 2007 Interim Guidelines) and, under Section
29 6.C.1, the annual release would be 7.48 maf (9,230 mcm). The Mid-Elevation Release Tier has
30 no possibility for adjustments to the operation of Lake Powell during the water year, unless
31 otherwise prescribed under the 2007 Interim Guidelines, and would remain at 7.48 maf (9,230
32 mcm).
33

34 Reclamation will continue to carefully monitor hydrologic and operational conditions and
35 assess the need for additional responsive actions and/or changes to operations. Reclamation
36 will continue to consult with the Basin States, Basin Tribes, the Republic of Mexico, and other
37 partners on Colorado River operations to consider future protective measures for both Lake
38 Powell and Lake Mead.
39

40 Maintenance of the eight generating units at Glen Canyon Dam requires them to be taken out of
41 service, in pairs, once each year for approximately one month. Additionally, in water years
42 2020 through 2024, all four transformers will be replaced, requiring the units to be taken out of
43 service, in pairs, This work-and should be completed by the end of calendar year 2024.

⁶³ The decision memo regarding the spring HFE is available online at:

<https://www.usbr.gov/uc/progact/amp/pdfs/LTEMP/20230420-Spring2023HFE-DecisionMemo-508-UCRO.pdf>

⁶⁴ A point in the mainstream of the Colorado River one mile below the mouth of the Paria River.

1 Reclamation is planning to perform maintenance on each of the four hollow jet valves in water
2 year 2024. Outages for annual maintenance and unit replacements are coordinated between
3 Reclamation offices in Salt Lake City, Utah, and Page, Arizona, and WAPA to minimize
4 impacts to operations.

5
6 Because of less than full storage conditions in Lake Powell resulting from drought in the
7 Colorado River Basin, releases from Glen Canyon Dam for dam safety purposes are highly
8 unlikely in 2024. If implemented, releases greater than powerplant capacity would be made
9 consistent with the 1956 Colorado River Storage Project Act,⁶⁵ the CRBPA, the LTEMP ROD,
10 and the Glen Canyon Dam Operating Criteria.

11
12 Releases from Lake Powell in water year 2024 will continue to reflect consideration of the uses
13 and purposes identified in the authorizing legislation for Glen Canyon Dam. Monthly releases
14 will also be consistent with the LTEMP ROD and applicable Secretarial decisions and are
15 updated to be consistent with annual volumes determined pursuant to the 2007 Interim
16 Guidelines.

17
18 For the latest monthly projections for Lake Powell, please see the most recent 24-Month Study
19 report available on Reclamation's Upper Colorado Region Water Operations website:
20 <https://www.usbr.gov/uc/water/crsp/studies/index.html>.

21
22 Daily and hourly releases in 2024 will be made according to the parameters of the Glen Canyon
23 Dam Operating Criteria. These parameters set the maximum and minimum flows and ramp
24 rates within which reservoir releases must be made. Exceptions to these parameters will be
25 made in accordance with the Emergency Exception Criteria as described in the Glen Canyon
26 Dam Operating Criteria.

27
28 During water year 2024, the Department of the Interior will coordinate planning for
29 experimental flows from Glen Canyon Dam in accordance with the 2016 Glen Canyon Dam
30 LTEMP ROD.

31 **Lake Mead**

32 For calendar year 2023, a Shortage Condition was the criterion governing the operation of Lake
33 Mead in accordance with Article III(3)(c) of the Operating Criteria, Article II(B)(3) of the
34 Consolidated Decree, Section 2.D.1.b of the 2007 Interim Guidelines, applicable provisions of
35 the LB DCP Agreement, and Sections III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP
36 Agreement, and taking into consideration water conservation efforts under the LB DCP
37 Agreement, a December 15, 2021 MOU to facilitate near-term actions to maintain the water
38 surface elevation at Lake Mead (the "500 Plus Plan"),⁶⁶ and the LC Conservation Program.
39 Delivery of water to Mexico was scheduled in accordance with Article 15 of the 1944 United
40 States-Mexico Treaty and Minutes No. 242, 323, and 327 of the IBWC.

65 Available online at: <https://www.usbr.gov/lc/region/pao/pdfiles/crspuc.pdf>.

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

1 Lake Mead began water year 2023 on October 1, 2022, at elevation 1,045.03 feet (318.53
2 meters), with 7.33 maf (9,040 mcm) in storage, which is 28 percent of the conservation
3 capacity⁶⁷ of 26.12 maf (32,220 mcm). Lake Mead ended water year 2023 at elevation 1,065.82
4 feet (324.86 meters) with 8.87 maf (10,940 mcm) in storage (34 percent of capacity) on
5 September 30, 2023.

6
7 The total release from Lake Mead through Hoover Dam during water year 2023 was 7.63 maf
8 (9,410 mcm). The total release from Lake Mead through Hoover Dam during calendar year
9 2023 is projected to be 7.77 maf (9,580 mcm).

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

17
18 Based on the August 2023 24-Month Study, Lake Mead's elevation on January 1, 2024 is
19 projected to be 1,067.80 feet (325.47 meters). In accordance with Section 2.D.1 of the 2007
20 Interim Guidelines and the applicable provisions of the LB DCP Agreement, a Shortage
21 Condition, consistent with Section 2.D.1.a of the 2007 Interim Guidelines, as well as Sections
22 III.B.1.a and III.B.2.a of Exhibit 1 to the LB DCP Agreement, respectively, will govern the
23 releases and diversions from Lake Mead in calendar year 2024. Releases from Lake Mead
24 through Hoover Dam may also be adjusted for the creation and/or delivery of ICS, consistent
25 with Section 3 of the 2007 Interim Guidelines and Sections III and IV of Exhibit 1 to the LB
26 DCP Agreement, in calendar year 2024.

27
28 Under the most probable inflow scenario, Lake Mead is projected to end water year 2024 at
29 elevation 1,054.57 feet (321.43 meters), with 8.02 maf (9,890 mcm) in storage (31 percent of
30 capacity). Following the end of the water year, Lake Mead is projected to rise to elevation
31 1,060.53 feet (323.25 meters) with 8.46 maf (10,440 mcm) in storage (32 percent of capacity)
32 at the end of calendar year 2024. The total release from Lake Mead through Hoover Dam
33 during water year 2024 is projected to be 8.47 maf (10,450 mcm). The total release from Lake
34 Mead through Hoover Dam during calendar year 2024 is projected to be 8.58 maf (10,580
35 mcm).

36
37 For the latest monthly projections for Lake Mead, please see the most recent 24-Month Study
38 report available on Reclamation's Lower Colorado Region Water Operations website:
39 <https://www.usbr.gov/lc/region/g4000/24mo/index.html>.

⁶⁷ 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.

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. 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. 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

1 Irrigation District (IID), the Coachella Valley Water District, and the City of Yuma, and
2 through Siphon Drop and Pilot Knob to the Northerly International Boundary (NIB) for
3 diversion at Morelos Dam by Mexico. Flows arriving at Imperial Dam for calendar year 2023
4 are projected to be 5.53 maf (6,820 mcm). The flows arriving at Imperial Dam for calendar
5 year 2024 are projected to be 5.30 maf (6,540 mcm).

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

17 Gila River Flows

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

30 Warren H. Brock Reservoir

31 The Warren H. Brock (Brock) Reservoir is located near the All-American Canal in Imperial
32 County, California. The purpose of the 0.0080 maf (9.9 mcm) Brock Reservoir is to reduce
33 non-storable flows and to enhance beneficial use of Colorado River water within the United
34 States. The reservoir reduces the impact of loss of water storage at Senator Wash due to
35 operational restrictions and provides additional regulatory storage, allowing for more efficient
36 management of water below Parker Dam. In 2021, Reclamation completed the Warren H.
37 Brock Reservoir Conservation Summary Report which includes, among other matters, a
38 summary of water conserved by Brock Reservoir from 2013 through 2019.⁶⁸ Water conserved
39 by Brock Reservoir from 2020 through 2022 may be found in the respective annual Colorado
40 River Accounting and Water Use Report, Arizona, California, and Nevada.⁶⁹

⁶⁸ Available online at: <https://www.usbr.gov/lc/region/programs/strategies/agreements/BrockReport.pdf>.

⁶⁹ Available online at: <https://www.usbr.gov/lc/region/g4000/wtracct.html>.

Yuma Desalting Plant

The Yuma Desalting Plant (YDP) was authorized in 1974 under the Colorado River Basin Salinity Control Act (Public Law 93-320)⁷⁰ 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)⁷¹ and/or Arizona Water Banking Authority (AWBA)⁷² in calendar years 2023 and 2024.

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 agreements⁷³ 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 agreements⁷⁴ and establishment of a DCP ICS

⁷⁰ Available online at: <https://www.usbr.gov/lc/region/pao/pdfiles/crbsalct.pdf>.

⁷¹ 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.

⁷² 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>.

⁷³ 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>.

⁷⁴ 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>.

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 ~~the other applicable~~ implementing agreements. ICS balances by state, user, and type of ICS may be found in the annual Colorado River Accounting and Water Use Report, Arizona, California, and Nevada⁷⁵ (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 2024.⁷⁶

**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)	submitted
IID	up to 0.062 maf (76 mcm)	approved	up to 0.062 maf (76 mcm)	submitted
MWD	up to 0.450 maf (555 mcm)	approved	up to 0.450 maf (555 mcm)	submitted
SNWA	up to 0.100 maf (123 mcm)	approved	up to 0.100 maf (123 mcm)	submitted

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

⁷⁵ Available online at: <https://www.usbr.gov/lc/region/g4000/wtracct.html>.

⁷⁶ 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>.

1 maf (80 mcm). In 2023 and 2024, CAWCD, MWD, and SNWA may request delivery of YDP
2 Pilot Run System Efficiency ICS credits.

3
4 **Tributary Conservation ICS.** SNWA has an approved plan to create up to 0.044 maf (54
5 mcm) of Tributary Conservation ICS in 2023 and has submitted a plan to create up to 0.044
6 maf (54 mcm) in 2024. Any Tributary Conservation ICS not delivered for use by SNWA in the
7 calendar year created will, at the beginning of the following year, be converted to Extraordinary
8 Conservation ICS pursuant to the 2007 Interim Guidelines.

9
10 **Imported ICS.** SNWA may submit plans to create Imported ICS in 2023 and 2024. Any
11 Imported ICS not delivered for use by SNWA in the calendar year created will, at the
12 beginning of the following year, be converted to Extraordinary Conservation ICS pursuant to
13 the 2007 Interim Guidelines.

14
15 **Binational ICS.** In 2023 and 2024, CAWCD, IID, MWD, and SNWA may request delivery of
16 Binational ICS subject to any applicable provisions in the delivery agreements.

17
18 **DCP ICS.** DCP ICS may be created in 2023 and 2024 by entities making DCP contributions
19 consistent with Section III of Exhibit 1 to the LB DCP Agreement. Following creation, DCP
20 ICS may be delivered in a subsequent year in accordance with Section III.F of Exhibit 1 to the
21 LB DCP Agreement.

22 **System Conservation**

23 ~~System conservation agreements have allowed water users to participate in projects designed to~~
24 ~~determine whether voluntary, temporary, and compensated programs to conserve or reduce~~
25 ~~consumptive use of Colorado River water can benefit the entire Colorado River system by~~
26 ~~mitigating the effect on declining storage levels in Colorado River reservoirs.^{77,78} Agreements~~
27 ~~previously executed under the PSCP in the Lower Basin continue to be implemented in 2023~~
28 ~~and 2024.⁷⁹~~

29
30 ~~Consistent with the Secretary's efforts to create or conserve 0.100 maf (123 mem) or more of~~
31 ~~Colorado River system water annually in the Lower Basin under the LB DCP Agreement and~~
32 ~~the additional conservation goals under the 500 Plus Plan MOU, Reclamation and the MOU~~
33 ~~parties have entered into agreements to create system conservation water consistent with these~~
34 ~~two agreements. As of June 2023, efforts under the 500 Plus Plan have concluded. A summary~~
35 ~~accounting of water conserved is in progress.~~

⁷⁷ 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.ucrccommission.com/ucrc-provides-sepp-status-update/>

⁷⁸ 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.

⁷⁹ 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 Program⁸⁰ 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.⁸¹

Additional projects or agreements to create or conserve system water in the Lower Basin may also be implemented in calendar years 2023 and/or 2024.

Delivery of Water to Mexico

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 0.0400.004 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).⁸² Balances of

⁸⁰ More information on the LC Conservation Program can be found online at: <https://www.usbr.gov/lc/LCConservation.html>.

⁸¹ Draft summary table of executed agreements is available online at: https://www.usbr.gov/lc/region/programs/LCConservation&EfficiencyProgram/System_Conservation_Implementation_Agreements.pdf.

⁸² Joint Report of the Principal Engineers with the Implementing Details of the

1 Mexico's Water Reserve in previous years may be found in the annual Colorado River
2 Accounting and Water Use Report, Arizona, California, and Nevada.⁸³

3
4 Of the scheduled delivery to Mexico in calendar year 2023, approximately 1.243 maf (1,530
5 mcm) is projected to be delivered at NIB and approximately 0.140 maf (173 mcm) is projected
6 to be delivered at SIB. Under IBWC Minute No. 327 and the Emergency Delivery
7 Agreement,⁸⁴ Mexico, through the IBWC, may request water to be delivered to Tijuana, Baja
8 California, through MWD, the San Diego County Water Authority, and the Otay Water
9 District's respective distribution system facilities in California. In calendar year 2023,
10 approximately 2,961 acre-feet (3.7 mcm) is scheduled to be delivered to Tijuana, Baja
11 California.

12
13 Of the total delivery at SIB projected in calendar year 2023, approximately 0.081 maf (100
14 mcm) is projected to be delivered from the Yuma Project Main Drain, and approximately 0.012
15 maf (15 mcm) No water is expected to be delivered by the Protective and Regulatory Pumping
16 Unit (242 well field) in calendar year 2023.

17
18 Excess flows arriving at the NIB are anticipated to be approximately 0.062 maf (76 mcm) in
19 calendar year 2023. Excess flows result from a combination of factors, including heavy rain
20 from seasonal storms, water ordered but not delivered to United States users downstream of
21 Parker Dam, inflows into the Colorado River below Parker Dam, releases from Painted Rock
22 Dam, and spills from irrigation facilities below Imperial Dam.

23
24 Pursuant to the 1944 United States-Mexico Water Treaty and Section III.A of IBWC Minute
25 No. 323, a volume of 1.45 maf (1,790 mcm) will be available to be scheduled for delivery to
26 Mexico in calendar year 2024. This volume may be further adjusted for water savings
27 contributions as required under Section IV of IBWC Minute No. 323. Mexico may create water
28 for or take delivery of water from Mexico's Water Reserve pursuant to Section III.C and
29 Section V of IBWC Minute No. 323. Approximately 0.140 maf (173 mcm) is projected to be
30 delivered at SIB and the remainder of the water to be scheduled for delivery to Mexico in 2024
31 will be delivered at NIB. Under IBWC Minute No. 327 and the Emergency Delivery
32 Agreement, water may be delivered to Tijuana through MWD, the San Diego County Water
33 Authority, and the Otay Water District's respective distribution system facilities in California.

34
35 Drainage flows to the Colorado River from the South Gila Drain Pump Outlet Channels and the
36 Yuma Mesa Conduit are projected to be 0.029 maf (36 mcm) and 0.012 maf (15 mcm),
37 respectively, for calendar year 2023. Consistent with Articles 11 and 15 of the 1944 United
38 States-Mexico Water Treaty and IBWC Minute No. 242, this water is available for delivery at
39 NIB in satisfaction of the 1944 United States-Mexico Water Treaty.

40

Binalational Water Scarcity Contingency Plan in the Colorado River Basin. Available online at:
https://www.ibwc.gov/Files/joint_report_min323_bi_water_scarcity_contingency_plan_final.pdf.

⁸³ Available online at: <https://www.usbr.gov/lc/region/g4000/wtracct.html>.

⁸⁴ 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.

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 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.

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

7 **Lower Basin**

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

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

17
18 The Operating Criteria provide that after the commencement of delivery of mainstream water
19 by means of the Central Arizona Project, the Secretary will determine the extent to which the
20 reasonable beneficial consumptive use requirements of mainstream users are met in the Lower
21 Division States. Reasonable beneficial consumptive use requirements are met depending on
22 whether a Normal, Surplus, or Shortage Condition has been determined. The Normal Condition
23 is defined as annual pumping and release from Lake Mead sufficient to satisfy 7.50 maf (9,250
24 mcm) of consumptive use in accordance with Article III(3)(a) of the Operating Criteria and
25 Article II(B)(1) of the Consolidated Decree. The Surplus Condition is defined as annual
26 pumping and release from Lake Mead sufficient to satisfy in excess of 7.50 maf (9,250 mcm)
27 of consumptive use in accordance with Article III(3)(b) of the Operating Criteria and Article
28 II(B)(2) of the Consolidated Decree. An ICS Surplus Condition is defined as a year in which
29 Lake Mead's elevation is projected to be above elevation 1,075.00 feet (327.66 meters) on
30 January 1, a Flood Control Surplus has not been determined, and delivery of ICS has been
31 requested. The Secretary may determine an ICS Surplus Condition in lieu of a Normal
32 Condition or in addition to other operating conditions that are based solely on the elevation of
33 Lake Mead. The Shortage Condition is defined as annual pumping and release from Lake Mead
34 insufficient to satisfy 7.50 maf (9,250 mcm) of consumptive use in accordance with Article
35 III(3)(c) of the Operating Criteria and Article II(B)(3) of the Consolidated Decree.

36
37 The 2007 Interim Guidelines are being utilized in calendar year 2024 and serve to implement
38 the narrative provisions of Article III(3)(a), Article III(3)(b), and Article III(3)(c) of the
39 Operating Criteria and Article II(B)(1), Article II(B)(2), and Article II(B)(3) of the
40 Consolidated Decree for the period through 2026. The 2007 Interim Guidelines will be used
41 annually by the Secretary to determine the quantity of water available for use within the Lower
42 Division States.

43
44 Consistent with the 2007 Interim Guidelines and the LB DCP Agreement, the August 2023 24-
45 Month Study was used to forecast the system storage as of January 1, 2024. Based on a

1 projected January 1, 2024 Lake Mead elevation of 1,065.27 feet (324.69 meters) and consistent
2 with Section 2.D.1 of the 2007 Interim Guidelines, a Shortage Condition, consistent with
3 Section 2.D.1.a, will govern releases for use in the states of Arizona, Nevada, and California
4 during calendar year 2024 in accordance with Article III(3)(c) of the Operating Criteria and
5 Article II(B)(3) of the Consolidated Decree. In addition, consistent with Sections III.B.1.a and
6 III.B.2.a of Exhibit 1 to the LB DCP Agreement, DCP contributions will be required by
7 Arizona and Nevada, respectively, in calendar year 2024. Water deliveries in the Lower Basin
8 during calendar year 2024 will be limited to 7.167 maf (8,840 mcm) and will be further
9 adjusted for DCP contributions and creation and/or delivery of ICS credits and/or DSS.

10
11 Article II(B)(6) of the Consolidated Decree allows the Secretary to allocate water that is
12 apportioned to one Lower Division State but is for any reason unused in that state to another
13 Lower Division State. This determination is made for one year only, and no rights to recurrent
14 use of the water accrue to the state that receives the allocated water. No unused apportionment
15 for calendar year 2023 is anticipated. If any unused apportionment becomes available after
16 adoption of this AOP, Reclamation, on behalf of the Secretary, may allocate any such available
17 unused apportionment for calendar year 2024 in accordance with Article II(B)(6) of the
18 Consolidated Decree, the Unused Water Policy, and giving further consideration to the water
19 conservation objectives of the July 30, 2014 agreement for the PSCP, the LC Conservation
20 Program, and as specified in Section 4.b of the LB DCP Agreement.

21
22 In calendar year 2024, water may be stored off-stream pursuant to individual SIRAs and 43
23 CFR Part 414 within the Lower Division States. The Secretary shall make ICUA available to
24 contractors in Arizona, California, or Nevada pursuant to individual SIRAs and 43 CFR Part
25 414. SNWA may propose to make unused Nevada basic apportionment available for storage
26 by MWD and/or AWBA in calendar year 2023.

27
28 The IOPP, which became effective January 1, 2004, will be in effect during calendar year 2024.
29 In accordance with Section 2.6.e of the IOPP, further accumulation of inadvertent overruns in
30 calendar year 2024 will be suspended. Payback balances by state and user may be found in the
31 annual Colorado River Accounting and Water Use Report, Arizona, California, and Nevada.⁸⁵

32
33 In calendar year 2024, conserved Colorado River water, created through the PSCP, the LB
34 DCP Agreement, the LC Conservation Program, and other voluntary agreements, is anticipated
35 to be added to system reservoirs in the Lower Basin pursuant to system conservation
36 agreements.

37
38 The 2007 Interim Guidelines included the adoption of the ICS mechanism, which was
39 expanded upon in the LB DCP Agreement, that among other things encourages the efficient use
40 and management of Colorado River water in the Lower Basin. In calendar year 2024, ICS
41 credits will be created and delivered pursuant to Section 3 of the 2007 Interim Guidelines,
42 Sections III and IV of Exhibit 1 to the LB DCP Agreement, and appropriate forbearance and
43 delivery agreements, and consistent with approved ICS plans of creation.
44

⁸⁵ Available online at: <https://www.usbr.gov/lc/region/g4000/wtracct.html>.

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 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, as detailed in the 2019 Joint Engineers' Report. In accordance with Section III.C and Section V of IBWC Minute No. 323, 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, or Minute No. 327 of January 28, 2022; 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);

1 the Colorado River Basin Salinity Control Act (88 Stat. 266; 43 U.S.C. 1951); the Hoover
2 Power Plant Act of 1984 (98 Stat. 1333); the Hoover Power Allocation Act of 2011 (125 Stat.
3 777); the Colorado River Floodway Protection Act (100 Stat. 1129; 43 U.S.C. 1600); the Grand
4 Canyon Protection Act of 1992 (Title XVIII of Public Law 102-575, 106 Stat. 4669); the
5 Decree Quantifying the Federal Reserved Right for Black Canyon of the Gunnison National
6 Park (Case No. 01CW05, District Court, Colorado Water Division No. 4, 2008); the Colorado
7 River Drought Contingency Plan Authorization Act (Public Law 116-14); or the rules, criteria,
8 guidelines, and decisions referenced within this AOP.

DRAFT

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
2023 Plan	2023 DROA Plan which spans from May 2023 through April 2024
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 <i>Arizona v. California</i> , 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
<u>SCPP</u>	<u>System Conservation Pilot Program</u>
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
<u>Water Accounting Report</u>	<u>Colorado River Accounting and Water Use Report, Arizona, California, and Nevada</u>
WY	Water Year
YDP	Yuma Desalting Plant