Chapter 1. Purpose and Need

1.1 Introduction

Prudent management of the Colorado River Basin (Basin) is crucial because the Colorado River is the foundation for diverse resources across a large geographic region and faces exceptional challenges from prolonged drought and future uncertainty. States, tribes, and Mexico rely on the Colorado River to support essential municipal, agricultural, environmental, cultural and hydropower needs. These resources are now at significant risk: since the onset of the current drought in 2000, the Basin's primary reservoirs, Lake Powell and Lake Mead, have fallen to historically low elevations. Several of the major reservoir- and water-management documents and agreements developed to guide Colorado River operations through the persistently dry conditions expire in 2026, including the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines; Reclamation 2007), the 2019 Colorado River Drought Contingency Plans (DCPs, Reclamation 2019), and key international agreements between the United States and Mexico.[1] Despite the significance of these agreements, actions taken over the past two decades have not been sufficiently robust to prevent continued decline of the reservoirs.

The 2007 Interim Guidelines have provided operating criteria for Lake Powell and Lake Mead, including provisions designed to provide Colorado River water users, particularly those in the Lower Division States, a greater degree of predictability with respect to the timing and volumes of potential water delivery reductions, as well as additional operating flexibility to conserve and enhance water storage water in Lake Mead. The 2007 Interim Guidelines were adopted for a limited period ("interim") to provide an opportunity for the Bureau of Reclamation (Reclamation) and interested entities to gain valuable experience for the management of Lake Powell and Lake Mead under modified operations, with the goal of improving the analytical bases for making future operational decisions, whether during the interim period or after. The valuable experience managing Lake Powell and Lake Mead gained since the adoption of the 2007 Interim Guidelines has informed important considerations in developing new guidelines for the post-2026 period.

The Secretary (Secretary) of the Department of the Interior (Department), acting through Reclamation, proposes adoption of new guidelines and coordinated management strategies to address Lake Powell and Lake Mead through their full operating range to take effect when the current agreements expire in 2026. Management strategies will primarily focus on the operation of Glen Canyon Dam and Hoover Dam but may include actions upstream and downstream of these facilities to protect critical reservoir elevations, such as releases from the Colorado River Storage

[1] International agreements are pursuant to the U.S.-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande (1944 Water Treaty; IBWC 1944). The U.S. will conduct all necessary and appropriate discussions regarding the proposed federal action and implementation of the 1944 Water Treaty with Mexico through the U.S. Section of the International Boundary and Water Commission (USIBWC) in consultation with the Department of State.

Project (CRSP) Upper Initial Units and approaches to enhance opportunities for Lower Basin water users to reduce water use (see **Map 1-1**). This document evaluates a range of operational alternatives for post-2026 reservoir management.

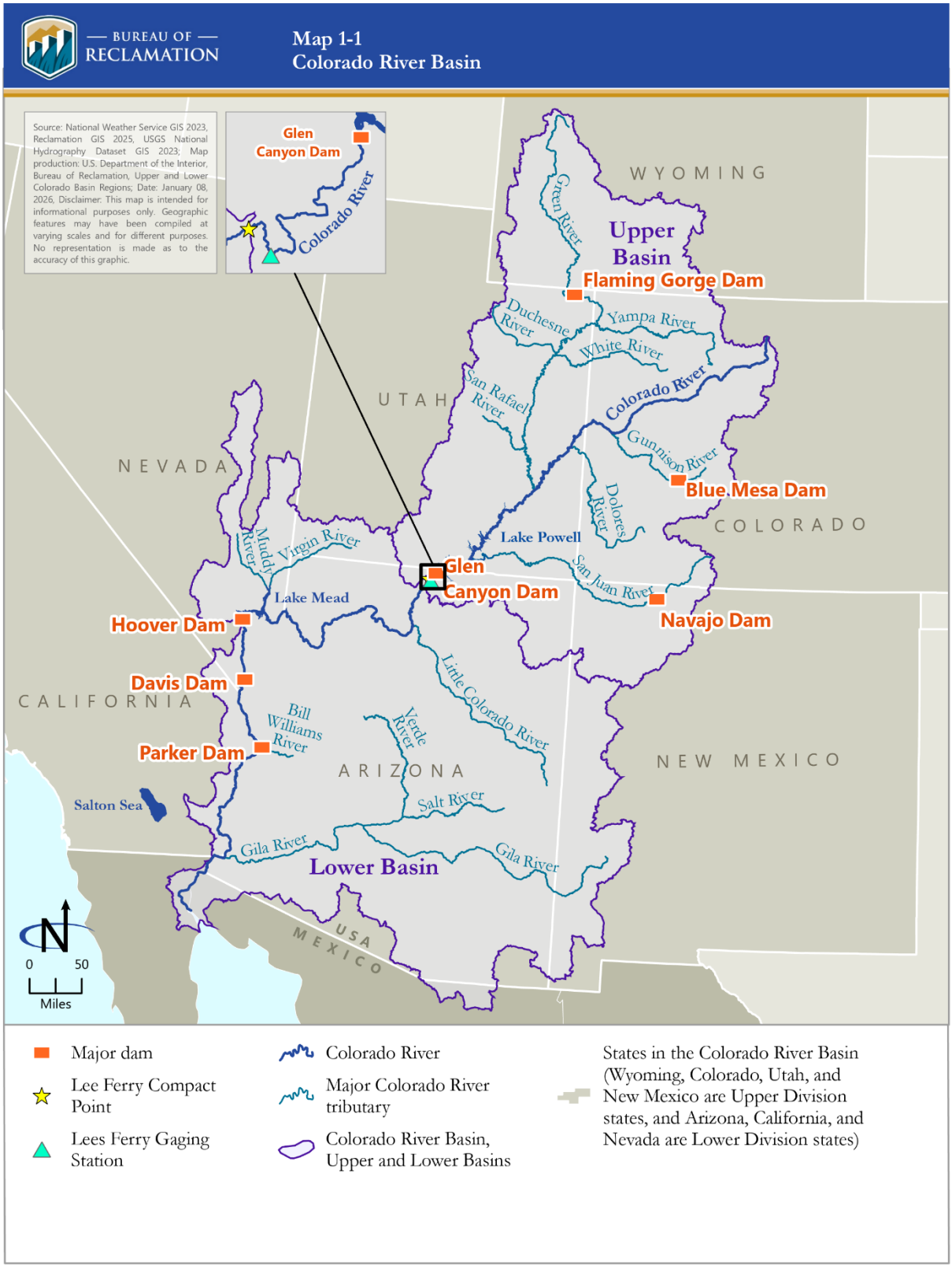
Developing new guidelines is difficult in this complex Basin, where critically low storage in Lake Powell and Lake Mead, significant hydrologic variability, and the anticipation of drier future conditions amplify the central tradeoff: balancing the potentially profound impacts of water-delivery reductions with the need to maintain reservoir storage. The alternatives in this Draft EIS capture a broad range of management strategies to address this tradeoff, and they demonstrate that there are multiple ways to find a balance if conditions improve. If conditions do not improve, achieving a balance is more difficult, and, under critically dry futures, even large and unprecedented reductions may not be enough to stabilize storage.

Since 2000, the Basin has been experiencing one of the worst multi-decade droughts of the last 1,200 years.[2] In the early part of this period, falling reservoir elevations, together with the lack of objective criteria for managing the reservoirs at lower levels, prompted the adoption of the 2007 Interim Guidelines. Since their adoption, average annual flows have continued to decline and flows have been significantly below average in nearly half of the years from 2008 to 2025.[3] Despite additional responsive actions to reduce the risk to the Colorado River system's critical infrastructure[4] and water supplies, including the 2019 Colorado River DCPs, storage in Lake Powell and Lake Mead continued to fall: the reservoirs are currently near the historic low elevations seen in 2022 and 2023. The Secretary intends to adopt new operating guidelines that provide more robust operating provisions than the current guidelines to address the continued loss of storage and the potential for increasing severity of drought and low runoff conditions.

Given the magnitude of the tradeoffs and the considerable hydrologic uncertainty, and recognizing the important operating experience gained during the current interim period, the Secretary proposes that these new guidelines also be interim in duration to gain additional operating experience. To provide stability and predictability to Basin water users, the Secretary intends that the interim period extend approximately 20 years; however, given the ongoing efforts toward achieving consensus among various Basin entities regarding appropriate post-2026 operations, the Secretary remains open to a shorter duration or phased implementation as part of a longer-term framework.

[2] The average streamflow from 2000 to 2025 is dryer than any 26-year period in the reconstructed paleo record developed by Meko, et al, which extends back to 760 AD (Meko et al. 2007).
[3] Since 2008, Lees Ferry, AZ, natural flow has been less than 75 percent of the 1991-2020 average in 7 out of 18 years.
[4] A primary concern for the Department has been to identify and implement actions to ensure Glen Canyon Dam and Hoover Dam continue to provide downstream water releases as designed and intended. Refer to **Sections 1.8.4.1 and 1.8.4.2** for more information on critical elevations.

Map 1-1
Colorado River Basin and Glen Canyon and Hoover Dams



Recognizing new authorities may be developed, the Secretary intends to consider, adopt and implement the proposed federal action[5] consistent with the Law of the River,[6] including the Colorado River Compact of 1922 (Compact; 43 U.S. Code [USC] § 617l), the Consolidated Decree entered by the U.S. Supreme Court in the case of *Arizona v. California*, 547 U.S. 150 (2006) (Consolidated Decree), and other provisions of applicable federal law. The proposed federal action will be implemented through the adoption of interim guidelines that would be used each year by the Department in implementing the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (1968 Long-Range Operating Criteria [LROC]; Colorado River Basin Project Act of 1968 [CRBPA]; Reclamation 1970) through issuance of the Annual Operating Plan for Colorado River Reservoirs (AOP).

This Draft Environmental Impact Statement (Draft EIS) is being prepared in compliance with the National Environmental Policy Act (NEPA)[7] for the Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead (Post-2026 process). It analyzes a broad range of reasonable alternatives for potential future guidelines and reservoir management strategies for the Colorado River. This Draft EIS analyzes the tradeoffs between the frequency and magnitude of shortages, the potential effects on water storage in Lake Powell and Lake Mead, and on water supplies, power production, recreation, and other environmental resources and, in doing so, identifies the potential relevant environmental issues associated with implementing the proposed federal action.

1.2 Proposed Federal Action

As set forth in the Federal Register notice published on October 20, 2023 (88 *Federal Register* 72535), this section identifies the anticipated Proposed Federal Action in the ongoing NEPA process.

Reclamation, acting on behalf of the Secretary, proposes to adopt specific guidelines and coordinated reservoir management strategies to address operations of Lake Powell and Lake Mead through their full operating ranges. This action would improve predictability to all water users and managers in the Basin by developing and adopting objective guidelines for the operation of Glen Canyon Dam and Hoover Dam to take effect when the current operating guidelines expire in 2026. This action is designed to provide for the sustainable management of the Colorado River system and its resources under a wide range of potential future system conditions.

[5] The phrase "proposed federal action" is used herein to refer to the action that the Secretary may take to meet the purpose and need. A range of alternatives are considered in this document; a preferred alternative may be identified in the Final EIS following public comments on the Draft EIS.

[6] The treaties, compacts, decrees, statutes, regulations, and other legal documents and agreements applicable to the allocation, appropriation, development, exportation, and management of the waters of the Basin are often referred to as the "Law of the River." There is no single, universally agreed-upon definition of the "Law of the River," but it is useful as a shorthand reference to describe this longstanding and complex body of legal agreements governing the Colorado River.

[7] 42 USC § 4321 *et seq.*

The proposed federal action considers the following operational elements that are collectively designed to address the purpose and need for the proposed federal action:

1) Identification of circumstances under which the Secretary would allocate, reduce, or increase the annual amount of water available for consumptive use from Lake Mead to the Lower Division states (Arizona, California, and Nevada) at, below, or above 7.5 million acre-feet (maf), pursuant to the Supreme Court Decree in *Arizona* v. *California*, 376 U.S. 340 (1964) (Final Decree entered in 2006).
2) Coordinated operations of Lake Powell and Lake Mead, particularly under low reservoir conditions.
3) Storage and delivery of conserved water in Lake Mead and/or Lake Powell to increase the flexibility to meet water use needs from both reservoirs, including the storage and delivery of non-system water; exchanges; and water conserved through extraordinary measures by or for tribal, agricultural, or municipal entities.

The proposed federal action allows for development of robust operating guidelines for Lake Powell and Lake Mead without precluding upstream or downstream actions needed to protect critical reservoir elevations at Lake Powell and Lake Mead, such as the following:

- Approaches that consider total system storage in all major Colorado River reservoirs and/or actual inflows to determine coordinated operations of Lake Powell and Lake Mead.
- Approaches that include opportunities for conservation, augmentation, demand management, or other water management strategies.
- Emergency response operations at upstream CRSP reservoirs to protect critical infrastructure at Glen Canyon Dam.

The Secretary intends that the guidelines be interim in nature and extend for the same duration as the 2007 Interim Guidelines (approximately 20 years). Adoption of new guidelines for an interim (or limited) period provides the opportunity to gain additional experience for operating the reservoirs, thereby informing future operational and water management decisions. Given the ongoing efforts toward achieving consensus among various Basin entities regarding appropriate post-2026 operations, the Secretary remains open to a shorter duration or phased implementation as part of a longer-term framework.

Recognizing additional authorities may be developed, the Department intends to adopt and implement the guidelines in a manner consistent with the Law of the River. The Department also intends that the guidelines be used to implement the LROC through the issuance of the AOP.

1.3 Purpose of and Need for Action

The proposed federal action is needed for the following reasons:

- *The Secretary is legally required to coordinate operations of Colorado River reservoirs:* The CRBPA directs the Secretary to adopt criteria for the coordinated long-range operation of Colorado River reservoirs. In compliance with this obligation, the LROC were developed and adopted by the Secretary in 1970. The LROC provides general narrative guidance regarding Lake Powell and Lake Mead operations but does not contain specific, objective criteria to guide annual operations. To address this inadequacy, the 2007 Interim Guidelines were developed to provide objective criteria used by the Department to implement the LROC. The 2007 Interim Guidelines have provided the predictability needed by the entities that receive Colorado River water to better plan for and manage available water supplies from the Colorado River and other sources.
- The *2007 Interim Guidelines are expiring:* Current operational guidelines expire during the 2026 operating year. The Department has determined that specific, objective operational guidelines are important to provide improved predictability and should be established for another interim period beyond 2026. Most of the federal and non-federal agreements associated with implementing provisions of the 2007 Interim Guidelines also expire after the 2026 operating year.
- *The 2007 Interim Guidelines have not sufficiently reduced risk:* Based on operational experience since 2007, the current guidelines are not robust enough to manage the system in a way that is sufficiently protective of the resources dependent on the Colorado River. Despite near-continuous drought-response actions in recent years, low-reservoir conditions have persisted, and new infrastructure risks at Glen Canyon Dam have arisen. More robust and adaptive guidelines are needed for the efficient and sustainable management of the major mainstream Colorado River reservoirs and system resources.
- *Imbalance between water supply and demand will be exacerbated by increasingly likely low-runoff conditions:* The Basin is experiencing increased aridity due to climate variability, and long-term drought and low-runoff conditions are expected in the future. These conditions will exacerbate the now widely recognized imbalance between water supply and demand in the Basin. Robust and flexible guidelines are needed to manage the Colorado River system and its resources under a broad range of potential future hydrologic conditions.
- *Expanded and innovative use of conservation is needed:* Recognizing the anticipated future low-runoff conditions in the Basin, the Department has also determined a need for guidelines that provide Colorado River water users, including Basin Tribes, expanded opportunities to conserve, store, and take subsequent delivery of water in and from Lake Mead and/or Lake Powell. The guidelines should also support and integrate future efficiency improvements and opportunities for augmentation.
- *Addressing tribal concerns regarding Basin management is needed:* Basin Tribes have expressed concern that the current approach to Colorado River water management is insufficient to address the range of interests, needs, and fundamental rights of the Basin Tribes. The Department has determined a need for guidelines that provide flexibility and predictability

for Basin Tribes to remain able to benefit from their water rights and have opportunities to participate in voluntary conservation programs.

The purpose for the proposed federal action is to:

- Update and expand management guidelines for Colorado River reservoirs, particularly for the coordinated operation of Lake Powell and Lake Mead
- Provide Colorado River water users a greater degree of predictability with respect to annual water availability in future years under anticipated increasing variability, low runoff, and low-reservoir conditions
- Provide additional mechanisms for the conservation, storage, and delivery of water supplies in Colorado River reservoirs
- Provide new or enhanced opportunities for Basin Tribes to benefit from their water rights
- Provide flexibility to build resilience and accommodate future needs and growth that are supported by Colorado River water supplies, including the integration of unquantified tribal water rights once they are resolved

1.4 Lead and Cooperating Agencies

The Secretary is responsible for operating Glen Canyon Dam and Hoover Dam, as well as managing the mainstream waters of the lower Colorado River in accordance with federal law. These responsibilities are carried out consistent with the Law of the River. Reclamation, as the agency that is designated to act on the Secretary's behalf with respect to these matters, is the lead federal agency for the purposes of NEPA compliance and for the development and implementation of the proposed interim guidelines.

The following federal agencies are cooperating in the environmental analysis and preparation of this Draft EIS:

- Bureau of Indian Affairs (BIA)
- National Park Service (NPS)
- U.S. Fish and Wildlife Service (FWS)
- USIBWC
- Western Area Power Administration (WAPA)

1.5 Scope of the EIS

The scope of this Draft EIS was informed by applicable federal law, Reclamation's operating experience under the 2007 Interim Guidelines, documentation of that experience,[8] and efforts conducted by Reclamation to gather public input on the scope of Post-2026 guidelines. Before

[8] In 2020, Reclamation completed a retrospective evaluation (Reclamation 2020) to document the effectiveness of the 2007 Interim Guidelines with respect to the purpose stated in the 2007 ROD.

formally initiating the NEPA process, in June 2022, Reclamation conducted a public "pre-scoping" effort requesting input on suggested mechanisms to ensure a wide range of stakeholder participation in the process and potential substantive elements to be considered for post-2026 operations.[9] Using the input received, on June 16, 2023, Reclamation published a Notice of Intent (NOI) to prepare an environmental impact statement (EIS) in the *Federal Register* (88 *Federal Register* 39455), formally initiating the public scoping process. A Notice of Availability (NOA) for the Scoping Report (Reclamation 2023b) was published in October 2023 in the *Federal Register* (88 *Federal Register* 72535), summarizing all public comments received during the scoping period (June 16, 2023, to August 15, 2023). Over the 60-day scoping period, Reclamation engaged with stakeholders through public webinars, tribal consultations, and technical education sessions. Reclamation received a total of 24,290 comment letters from a wide range of interested parties, including federal, state, and local entities; tribes; nongovernmental organizations; other stakeholder groups; and individuals. Reclamation considered the comments in developing the proposed federal action, purpose and need, and scope of the environmental analysis (see **Section 1.2**). A number of related efforts and parallel processes outside the scope of this federal action will continue independently from this Draft EIS but may inform the development and implementation of new guidelines. Specifically, the Department acknowledges the importance of ongoing tribal water rights settlements and associated negotiations in the Basin. The alternatives in this Draft EIS do not weigh in on or assume specific settlement terms, and the new guidelines are intended to be flexible enough to integrate tribal water rights once resolved.

The alternatives in this Draft EIS are designed to cover a wide range of potential outcomes with respect to post-2026 operations; accordingly, they incorporate components that are within existing authorities along with components that would require new authorities and/or new agreements among Basin water users to fully implement. Reclamation has determined that, based on public input received during the scoping and alternative development phases of the NEPA process, analysis of these operations will present a reasonable and broad range of Colorado River operations that capture an appropriate range of potential environmental impacts. Recognizing that additional authorities and agreements may be developed, the Secretary intends to adopt and implement new guidelines in a manner consistent with the Law of the River.

1.5.1 Geographic Scope of the Proposed Federal Action and Affected Regions and Interests

Consistent with the geographic scope analyzed in the 2007 Interim Guidelines FEIS, the geographic scope that would be affected by the proposed federal action begins at full pool of Lake Powell at Gypsum Canyon and extends downstream along the mainstream Colorado River floodplain to the Southerly International Boundary (SIB) with Mexico. While portions of northwestern Mexico are part of the Basin, these areas are not within the geographic scope of analysis for this EIS. This EIS does not address water deliveries to Mexico, however, in order to assess the potential effects of the

[9] The pre-scoping period began with a Federal Register notice on June 24, 2022 (87 *Federal Register* 37884). The Department received substantial feedback from Basin States, Basin Tribes, water users, non-governmental organizations, and the public, which Reclamation summarized in a Pre-Scoping Summary Report (Reclamation 2023a).

proposed federal action, certain modeling assumptions regarding water deliveries to Mexico are used in this Draft EIS.

This proposed federal action would also potentially affect interests of water users in the Lower Division States in service areas that extend beyond the Colorado River floodplain. **Section 3.2.1** identifies organizations whose geographic service area is included in impact analysis. However, general operations and facilities outside the mainstream Colorado River floodplain may fall within separate Records of Decision (RODs) and authorities that are outside the scope of the proposed interim guidelines.

Although the proposed federal action is focused on Lake Powell and Lake Mead operations, management strategies that include activities upstream of Lake Powell are being analyzed in this Draft EIS. These activities include Upper Basin conservation and, if warranted to protect critical reservoir elevations, operations at the CRSP Upper Initial Units (see **Map 1-1**). Operations at the CRSP Upper Initial Units specifically contemplated in the Draft EIS alternatives are intended to remain within the scope of the existing RODs (Reclamation 2006a, 2006b, 2012).[10] Accordingly, the Draft EIS does not expand the geographic scope of analysis upstream of Lake Powell. With respect to Upper Basin conservation, the nexus to the proposed federal action is the storage and delivery of that conserved water in Lake Powell. The effects of this storage in and delivery from Lake Powell are within the scope of the EIS (see **Section 3.3**, Hydrologic Resources, and **TA 3**, Hydrologic Resources), while specific activities that may be undertaken in the Upper Basin to generate the conserved water are not within the scope of this EIS. Any such activities are unknown at this time and will not necessarily require federal decision making. Any federal decisions associated with these conservation activities will be assessed outside of this EIS.

1.6 Application of NEPA Rules and Policy

As of April 11, 2025, the Council on Environmental Quality (CEQ) repealed its NEPA implementing regulations through a notice published in the *Federal Register* (90 FR 10610, Feb. 25, 2025), in accordance with Executive Order 14154, Unleashing American Energy (90 FR 8353; January 29, 2025), and directed agencies to revise their NEPA implementing procedures. On July 3, 2025, the Department issued an interim final rule partially rescinding its prior NEPA implementing regulations[11] and making necessary targeted updates to its remaining regulations (2025 Interim Final Rule). The 2025 Interim Final Rule is "effective immediately." The Department is following the 2025 Interim Final Rule to prepare this Draft EIS.

[10] While the Secretary will consider and prioritize operations at these facilities that are consistent with existing RODs, the Secretary retains the authority to operate outside those RODs if necessary. The modeling assumptions regarding operation of the CRSP Upper Initial Units presented in this Draft EIS are not intended to, and do not, limit the Secretary's ability to operate these facilities as necessary to respond to hydrologic conditions in accordance with applicable federal law, including operations for the authorized purposes as stated in the 1956 Colorado River Storage Project Act.

[11] NEPA Implementing Regulations, Interim Final Rule, Request for Comment, 43 Code of Federal Regulations (CFR) Part 46; the Department has retained and updated specific regulatory provisions regarding emergency response procedures, categorical exclusions and document preparation by applicants and contractors.

The 2025 Interim Final Rule allows discretionary opportunities for public participation. Reclamation is using these discretionary opportunities, such as issuing a Draft EIS and providing a comment period, for example, to enhance public participation on the important topic of Colorado River operations. Reclamation will also use opportunities in the 2025 Interim Final Rule to streamline this NEPA process.

This NEPA process applies to Reclamation's operation of Colorado River facilities and those operations are inherently ongoing and cannot be suspended, including pending the development of new operating guidelines.[12] Reclamation's operations involve continuous adjustment to variable hydrologic conditions to maintain infrastructure integrity, deliver, and release water to Basin users consistent with the Law of the River. Even when operations may elicit objections, particularly under challenging hydrologic regimes, Reclamation cannot stop operating facilities until objections are resolved. Reclamation will continue to operate within the framework of applicable federal law, established authorities, and operational judgment aligned with any updated guidelines as necessary to respond to current and projected system conditions.

1.7 Summary of Contents of this Draft EIS

Following is a brief description of the topics presented in the three volumes that comprise this Draft EIS.

Volume I of this Draft EIS (this volume) describes the proposed federal action, the alternatives considered, and the analysis of the potential effects of these alternatives on Colorado River operations and associated resources. The contents of the chapters in this volume are as follows:

- **Chapter 1, Purpose and Need,** includes the following: identification of the purpose of and need for Lower Basin shortage guidelines and coordinated reservoir management strategies of Lake Powell and Lake Mead being considered in the proposed federal action; background information concerning the apportionment of Colorado River waters and the physical facilities associated with the Basin; and discussion of the institutional framework within which the Basin is managed. Chapter 1 also discusses previous and ongoing actions that have a relationship to the proposed federal action.
- **Chapter 2, Description of Alternatives,** describes the process of formulating alternatives and presents a range of reservoir operation strategies and guidelines considered under each alternative. A summary table of potential environmental consequences of these alternatives is provided at the end of Chapter 2.
- **Chapter 3, Affected Environment and Environmental Consequences,** describes the affected environment for the proposed federal action and evaluates potential impacts that could result from implementation of the alternatives under consideration. The discussion also addresses environmental consequences, i.e., potential effects of the action alternatives that could occur as compared to the No Action Alternative.

[12] See, e.g., Boulder Canyon Project Act of 1928 (BCPA), 45. Stat. 1057 (Dec. 21, 1928), sections 5 and 6; Consolidated Decree, Sections II-III.

- **Chapter 4, Consultation and Coordination,** describes the public involvement process, including public notices, scoping meetings, and hearings. This chapter also describes the coordination with federal and state agencies, Basin Tribes, and Mexico (through the USIBWC) during the preparation of this document and any permitting or approvals that may be necessary for implementation of the proposed federal action.

In addition to the above, Volume I includes a list of acronyms used throughout this document, a glossary of commonly used terms, a list of references cited in the Draft EIS, a list of persons contributing to the preparation of the Draft EIS, a distribution list of agencies, organizations and persons receiving copies of the document, and an index.

Volumes II and III contain appendices that are comprised of documents and other supporting material that provide detailed historical background and/or technical information concerning the proposed federal action.

1.8 Water Supply Management and Allocation

1.8.1 Colorado River System Water Supply

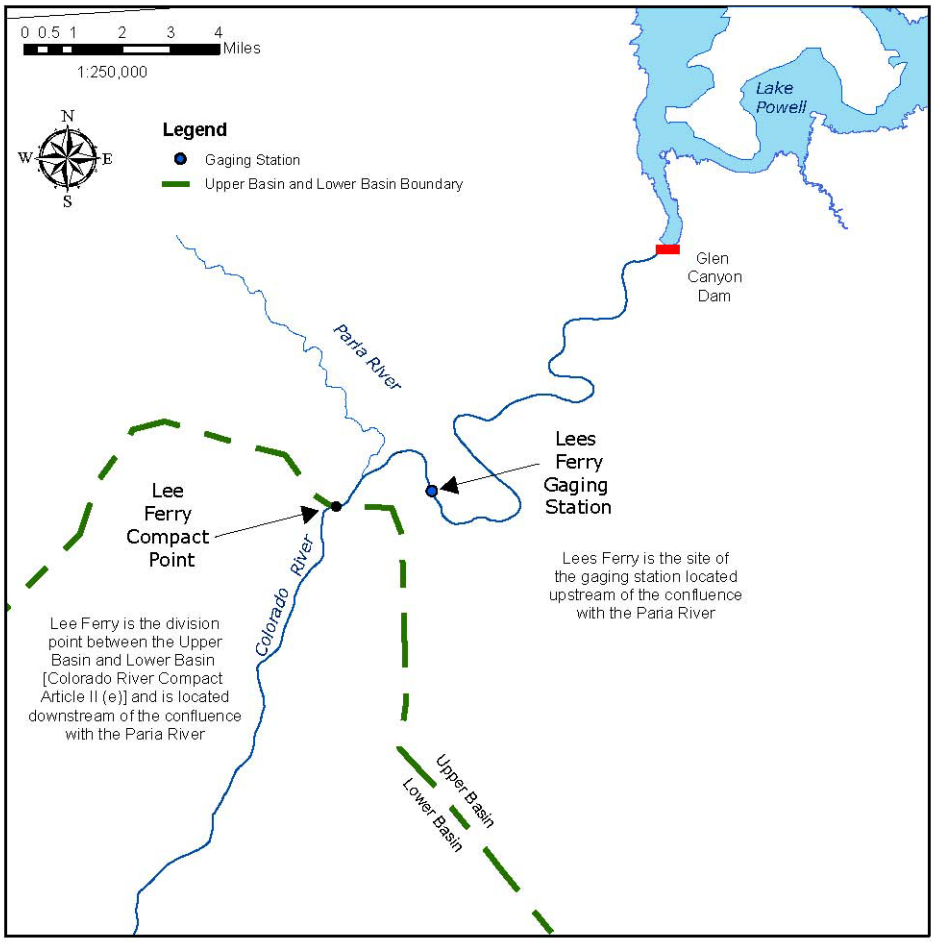
The Basin is located in the southwestern U.S., as shown on **Map 1-1**, and occupies an area of approximately 250,000 square miles. The Colorado River is approximately 1,400 miles in length and originates along the Continental Divide in Rocky Mountain National Park in Colorado. Elevations in the Basin range from sea level to over 14,000 feet above mean sea level (msl) in the mountainous headwaters.

Climate varies significantly throughout the Basin. Most of the Basin is arid and semi-arid, defined as receiving less than 10 and less than 20 inches of precipitation per year, respectively. In contrast, many of the mountainous areas that rim the northern portion, making up about 15 percent of the Basin, average over 40 inches of precipitation per year.

Most of the total annual flow in the Basin is a result of natural runoff from mountain snowmelt. Because of this, flow is very high in the late spring and early summer, diminishing rapidly by mid-summer. While flows in late summer through autumn sometimes increase following rain events, flow in the late summer through winter is generally low. Major tributaries to the Colorado River include the Green River, San Juan River, Yampa River, Gunnison River, and Gila River.

The annual flow of the Colorado River and its tributaries varies considerably from year to year. The natural flow at the Lees Ferry Gaging Station in Arizona (**Figure 1-1**) located 15.9 river miles (RMs) downstream of Glen Canyon Dam, has varied annually from 5.0 maf to 23.0 maf. Natural flow represents an estimate of flows that would exist without human intervention. Natural flow at Lees Ferry Gaging Station (Lees Ferry natural flow) represents the supply generated in the Upper Basin, which typically makes up approximately 92 percent of the total natural flow in the Basin as measured at Imperial Dam.

Figure 1-1
Lees Ferry Gaging Station and Lee Ferry Compact Point



The average annual Lees Ferry natural flow from 1906 to 2020 is approximately 14.7[13] maf; for current climate,[14] the average flow from 1991 to 2020 is 13.5 maf. In the Lower Basin, the average annual flow below Lees Ferry (including inflow from the Little Colorado River, Virgin River, and Bill Williams River) from 1906 to 2020 is approximately 0.634 maf,[15] and the average flow from 1991-2020 is approximately 0.604 maf.

[13] Calendar year (cy) values. Natural flow data can be found here: https://www.usbr.gov/lc/region/g4000/NaturalFlow/current.html
[14] The World Meteorological Organization uses a 30-year period to designate the average "current climate," which is updated every 10 years.
[15] In 2022, Reclamation revised how natural flow is calculated in the Lower Basin; the previous method added back in estimated losses due to phreatophytes, and the current method does not.

1.8.2 Apportionment of Water Supply

This section summarizes the Law of the River, Colorado River apportionments of the Colorado River Basin States (Basin States), and the allotment to Mexico pursuant to the 1944 Water Treaty (IBWC 1944).

1.8.2.1. The Law of the River

The Secretary is vested with the responsibility to manage the mainstream waters of the Lower Basin pursuant to applicable federal law. This responsibility is carried out consistent with a body of documents referred to as the Law of the River. The Law of the River comprises numerous operating criteria, regulations, and administrative decisions included in federal and state statutes, interstate compacts, court decisions and decrees, an international treaty, and contracts with the Secretary.

Particularly notable among these documents are:

1. The Colorado River Compact of 1922, which apportioned beneficial consumptive use of water between the Upper Basin and Lower Basin
2. The BCPA, which authorized construction of Hoover Dam and the All-American Canal (AAC), required that water users in the Lower Basin have a contract with the Secretary, and established the responsibilities of the Secretary to direct, manage, and coordinate the operation of Colorado River dams and related works in the Lower Basin
3. The California Seven Party Agreement of 1931, which, through regulations adopted by the Secretary, established the relative priorities of rights among major users of Colorado River water in California
4. The 1944 Water Treaty (and subsequent minutes of the IBWC) related to the quantity and quality of Colorado River water delivered to Mexico
5. The Upper Colorado River Basin Compact of 1948, which apportioned the Upper Basin water supply among the Upper Division states
6. The Colorado River Storage Project Act of 1956 (CRSPA), which authorized a comprehensive water development plan for the Upper Basin that included the construction of Glen Canyon Dam and other facilities
7. The 1963 U.S. Supreme Court Decision in *Arizona v. California* which confirmed that the apportionment of the Lower Basin tributaries was reserved for the exclusive use of the states in which the tributaries are located; confirmed the Lower Basin mainstream apportionments of 2.8 maf for use in Arizona, 4.4 maf for use in California, and 0.3 maf for use in Nevada; provided water for American Indian (Indian) reservations and other federal reservations in Arizona, California, and Nevada; and confirmed the significant role of the Secretary in managing the mainstream Colorado River within the Lower Basin
8. The 1964 U.S. Supreme Court Decree (Decree) in *Arizona v. California* which implemented the Supreme Court's 1963 decision; the Decree was supplemented over time after its adoption and the Supreme Court entered a Consolidated Decree in 2006 which incorporates all applicable provisions of the earlier-issued decrees

9. The Colorado River Basin Project Act of 1968 (CRBPA; Public Law 90-537, 82 Stat. 885), which authorized construction of a number of water development projects including the Central Arizona Project (CAP)
10. The Colorado River Basin Salinity Control Act of 1974 (Public Law 93-320, 88 Stat. 266), which authorized a number of salinity control projects and provided a framework to improve and meet salinity standards for the Colorado River in the U.S. and Mexico
11. The Grand Canyon Protection Act of 1992 (Public Law 102-575, 106 Stat. 4669), which addressed the protection of resources in Grand Canyon National Park (GCNP) and in Grand Canyon National Recreation Area, consistent with applicable federal law

Documents which are generally considered as part of the Law of the River include, but are not limited to, those listed in **Table 1-1**. Among other provisions of applicable federal law, NEPA and the Endangered Species Act of 1973 (ESA; Public Law 93-205, 87 Stat. 884), as amended, provide a statutory overlay on certain actions taken by the Secretary. For example, as noted in **Section 1.1**, preparation of this Draft EIS has been undertaken pursuant to NEPA.

Table 1-1
Selected Documents Included in the Law of the River

- The Rivers and Harbors Act of March 3, 1899
- The Reclamation Act of June 17, 1902
- Reclamation of Indian Lands in Yuma, Colorado River and Pyramid Lake Indian Reservations Act of April 21, 1904
- Yuma Project authorized by the Secretary on May 10, 1904, pursuant to Section 4 of the Reclamation Act of June 17, 1902
- Warren Act of February 21, 1910
- Protection of Property Along the Colorado River Act of June 25, 1910
- Patents and Water-Right Certificates Acts of August 9, 1912, and August 26, 1912
- Yuma Auxiliary Project Act of January 25, 1917
- Availability of Money for Yuma Auxiliary Project Act of February 11, 1918
- Sale of Water for Miscellaneous Purposes Act of February 25, 1920
- Federal Power Act of June 10, 1920
- The Colorado River Compact of November 24, 1922
- The Colorado River Front Work and Levee System Acts of March 3, 1925, and January 21,1927–June 28, 1946
- The Boulder Canyon Project Act of December 21, 1928
- The California Limitation Act of March 4, 1929
- International Flood Control Measures, Lower Colorado River Act of August 10, 1964
- Southern Nevada (Robert B. Griffith) Water Project Act of October 22, 1965
- The Colorado River Basin Project Act of September 30, 1968
- Criteria for the Coordinated Long-Range Operation of Colorado River Reservoirs, June 8, 1970, amended March 21, 2005
- Supplemental Irrigation Facilities, Yuma Division Act of September 25, 1970
- 43 CFR 417, Lower Basin Water Conservation Measures, September 7, 1972
- Minute 218, March 22, 1965; Minute 241, July 14, 1972 (replaced Minute 218); Minute 242, August 30, 1973 (replaced Minute 241); Minute 306, December 12, 2000; Minute 317, June 27, 2010; Minute 318, December 17, 2010; Minute 319, November 20, 2012; Minute 323, September 21, 2017; and Minute 330, March 21, 2024, of the 1944 Water Treaty
- The Colorado River Basin Salinity Control Act of June 24, 1974
- The Hoover Power Plant Act of August 17, 1984
- Numerous Colorado River Water Delivery and Project Repayment Contracts with the States of Arizona and Nevada, cities, water districts, and individuals

- The California Seven Party Agreement of August 18, 1931
- The Parker and Grand Coulee Dams Authorization of August 30, 1935
- The Parker Dam Power Project Appropriation Act of May 2, 1939
- The Reclamation Project Act of August 4, 1939
- The Boulder Canyon Project Adjustment Act of July 19, 1940
- The Flood Control Act of December 22, 1944
- Treaty between the United States and Mexico Relating to the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande of February 3, 1944
- Gila Project Act of July 30, 1947
- The Upper Colorado River Basin Compact of October 11, 1948
- The Consolidated Parker Dam Power Project and Davis Dam Project Act of May 28, 1954
- The Palo Verde Diversion Dam Act of August 31, 1954
- Change Boundaries, Yuma Auxiliary Project Act of February 15, 1956
- The CRSPA of April 11, 1956
- The Water Supply Act of July 3, 1958
- The Boulder City Act of September 2, 1958
- Report of the Special Master, Simon H. Rifkind, *Arizona v. California*, et al., December 5, 1960
- The Consolidated Decree entered by the United States Supreme Court in the case of *Arizona v. California*, 547 U.S. 150 (2006)
- Hoover and Parker-Davis Power Marketing Contracts
- The Reclamation States Emergency Drought Relief Act of 1991
- The Grand Canyon Protection Act of October 30, 1992
- Operation of Glen Canyon Dam, ROD (1996)
- Interim Surplus Guidelines ROD, January 17, 2001 (66 *Federal Register* 7772)
- Interim 602(a) Storage Guideline, May 19, 2004 (69 *Federal Register* 28945)
- The Colorado River Water Delivery Agreement of October 10, 2003 (69 *Federal Register* 12202)
- Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead ROD, December 13, 2007 (73 *Federal* Register 19873)
- Hoover Power Allocation Act of December 20, 2011
- Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) ROD, December 2016
- Colorado River Drought Contingency Authorization Act (Public Law 116-14) - Colorado River Basin DCPs
- Supplement to the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead ROD, May 6, 2024
- Supplement to the 2016 Glen Canyon Dam LTEMP ROD, July 3, 2024

1.8.2.2. Apportionment to the Basin States

The initial apportionment of water from the Colorado River was determined as part of the Compact, which divided the Colorado River system into two sub-basins, the Upper Basin and the Lower Basin. The Upper Basin includes those parts of the states of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters drain naturally into the Colorado River above the Lee Ferry Compact Point in Arizona. The Lower Basin includes those parts of the states of Arizona, California, Nevada, New Mexico, and Utah within and from which waters drain naturally into the Colorado River below the Lee Ferry Compact Point. The Compact also divided the seven Basin States into the Upper Division and the Lower Division states (**Map 1-1**). The Upper Division states are Colorado, New Mexico, Utah and Wyoming. The Lower Division states are Arizona, California, and Nevada.

The Compact apportioned to the Lower Basin and the Upper Basin, in perpetuity, the exclusive beneficial consumptive use of 7.5 maf of water per year (mafy). In addition to this apportionment,

Article III(b) of the Compact gives the Lower Basin the right to increase their beneficial consumptive use by 1.0 mafy. The Compact also stipulates in Article III(d) that the Upper Division states will not cause the flow of the river at the Lee Ferry Compact Point to be depleted below an aggregate of 75.0 maf for any period of ten consecutive years. Article III(c) reflects the intent that any future water deliveries to Mexico be supplied first from surplus Colorado River water and, if surplus is insufficient, that the resulting deficiency be shared equally between the Upper and Lower Basins.

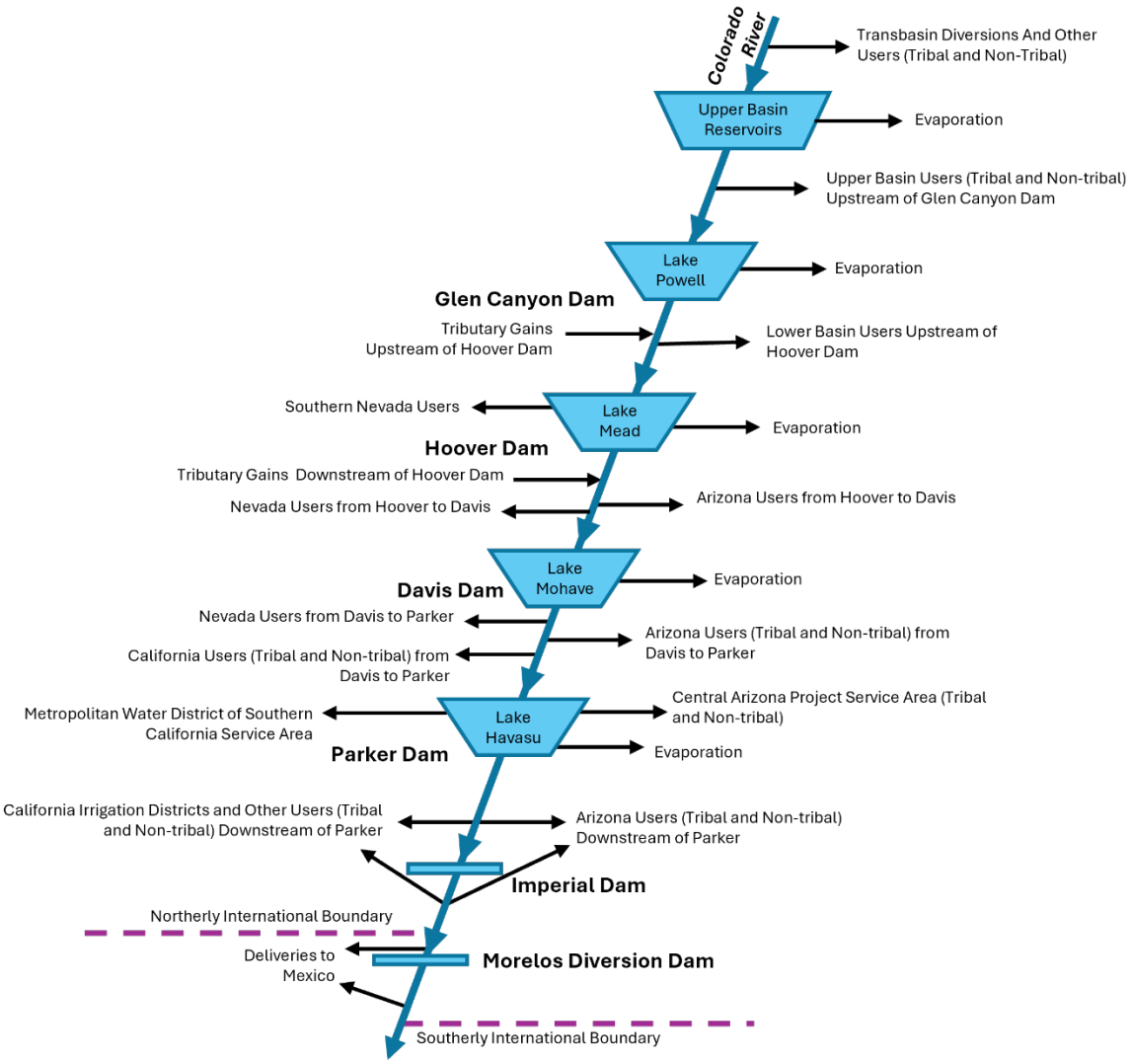
The Compact, in Article VII, states that nothing in the Compact shall be construed as affecting the obligations of the U.S. to Indian tribes. While the rights of most Indian tribes to Colorado River water were subsequently adjudicated, some Tribal rights remain unadjudicated. To the extent that Indian tribes consumptively use water from the Colorado River, such uses are included in the apportionment of the appropriate Basin State.

Upper Division State Apportionments. Upper Division state apportionments were established by the Upper Colorado River Basin Compact of 1948. These apportionments allocate the Upper Basin states consumptive use after deduction of up to 50,000 acre-feet per year (afy) for Arizona as follows: Colorado, 51.75 percent; New Mexico, 11.25 percent; Utah, 23.00 percent; and Wyoming, 14.00 percent. The Upper Basin state apportionments have not yet been fully developed.

Lower Division State Apportionments. Lower Division state apportionments were established by Congress in the BCPA and by the Secretary's water delivery contracts under the BCPA. These apportionments are: Arizona, 2.8 maf; California, 4.4 maf; and Nevada, 0.3 maf; totaling 7.5 maf, subject to annual increases or reductions pursuant to Secretarial determinations of a Surplus or a Shortage condition. Under Article II(B)(2) of the Consolidated Decree, when the Secretary determines that there is a Surplus Condition, 46 percent of the available water supply in excess of 7.5 maf may be apportioned for use in Arizona; 50 percent for use in California; and 4 percent for use in Nevada.

Figure 1-2 presents a schematic of the operation of the Colorado River, primarily in the Lower Basin. The Consolidated Decree confirms the apportionments to the Lower Division states established by the BCPA and guides the Secretary's operation of facilities, including Hoover Dam, on the lower Colorado River. If water apportioned for use in a Lower Division state is not consumed by that state in any year, the Secretary may release the unused water for use in another Lower Division state. Water that is stored off-stream by a Lower Division state (for future use by that state or by another Lower Division state) is accounted as consumptive use to the state that stored the water in the year it was stored.

Figure 1-2
Colorado River Reservoirs and Diversions



All mainstream Colorado River waters apportioned to the Lower Basin, except for a few thousand acre-feet (kaf) apportioned for use in Arizona, have been fully allocated to specific entities for permanent irrigation or domestic[16] use entitlements. These entities include irrigation districts, water districts, municipalities, Indian tribes, public institutions, private water companies, and individuals. Federal establishments with federal reserved rights established pursuant to Article II(D) of the Consolidated Decree are not required to have a contract with the Secretary, but the water allocated to a federal establishment is included within the apportionment of the Lower Division state in which the federal establishment is located; e.g., Fort Mojave Indian Reservation in California and the Havasu National Wildlife Refuge (NWR) in Arizona.

[16] The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power (1922 Compact, Article II(h)).

The highest priority lower Colorado River water rights are present perfected rights (PPRs), which the Consolidated Decree defines as those perfected rights existing on June 25, 1929, the effective date of the BCPA. The Consolidated Decree also recognizes federal Indian reserved rights for the quantity of water necessary to irrigate all the practicably irrigable acreage (lands considered suitable for irrigation) on five Indian reservations along the lower Colorado River. The Consolidated Decree defines the rights of Indian and other federal reservations to be federal establishment PPRs. PPRs are important because in any year in which less than 7.5 maf of Colorado River water is available for consumptive use in the Lower Division states, PPRs will be satisfied first, in the order of their priority without regard to state lines.

Waters available to a Lower Division state within its apportionment, but having a priority date later than June 25, 1929, have been allocated by the Secretary through execution of water delivery contracts to water users within that state as required by Section 5 of the BCPA. The Lower Division States have separate intrastate priority systems in accordance with those contracts.

1.8.2.3. Allotment to Mexico (Pursuant to the 1944 Water Treaty)

Allocation of Colorado River water to Mexico is governed by the 1944 Water Treaty. Article 10(a) of the 1944 Water Treaty states:

> "(a) A guaranteed annual quantity of 1,500,000 acre-feet (af; 1,850,234,000 cubic meters) to be delivered in accordance with the provisions of Article 15 of this Treaty"

Further, Article 10(b) of the 1944 Water Treaty provides:

> "(b) Any other quantities arriving at the Mexican points of diversion, with the understanding that in any year in which, as determined by the United States Section, there exists a surplus of waters of the Colorado River in excess of the amount necessary to supply uses in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually to Mexico, the United States undertakes to deliver to Mexico, in the manner set out in Article 15 of this Treaty, additional waters of the Colorado River system to provide a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters) a year. Mexico shall acquire no right beyond that provided by this subparagraph by the use of waters of the Colorado River system, for any purpose whatsoever, in excess of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually."

Additionally, Article 10 of the 1944 Water Treaty provides:

> "In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) a year, the water allotted to Mexico under subparagraph (a) of this Article will be reduced in the same proportion as consumptive uses in the United States are reduced."

The proposed federal action is for the purpose of adopting additional operational guidelines to improve the Department's annual management and operation of key Colorado River reservoirs for

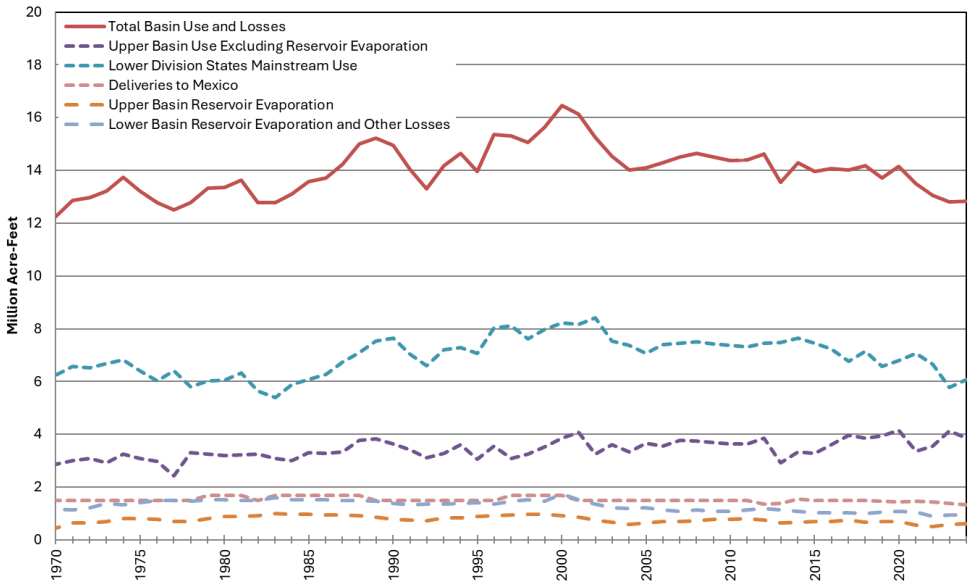
an interim period. However, in order to assess the potential effects of the proposed federal action in this Draft EIS, certain modeling assumptions (discussed in **Chapter 2**) are used that display projected water deliveries to Mexico. Reclamation's modeling assumptions are not intended to constitute an interpretation or application of the 1944 Water Treaty or to represent current U.S. policy or a determination of future U.S. policy regarding deliveries to Mexico.

The U.S. will conduct all necessary and appropriate discussions regarding the proposed federal action and implementation of the 1944 Water Treaty with Mexico through the IBWC in consultation with the Department of State.

1.8.3 Colorado River Basin Water Use

Total annual water "use" in the Basin is made up of diversions from the river, deliveries from reservoirs, and evaporation and other losses (e.g., seepage into the ground and usage by riparian vegetation). **Figure 1-3**, Historical Annual Colorado River Basin Use, shows Basin uses and losses from 1970 to 2024 as total Basin use and also shows use separated geographically and by whether it was use or evaporation and losses.

Figure 1-3
Historical Annual Colorado River Basin Use



From 1970 to 2001, Upper Basin varied between approximately 2.4 maf to approximately 4.1 maf, with a general upward trend over time. Since 2001, Upper Division States' use has varied within a similar range of volumes. Lower Division States' mainstream use increased from approximately 5.4 maf to approximately 8.4 maf from 1970 to 2002, and deliveries to Mexico were steady around 1.5 maf. Shortly after the onset of the ongoing drought in 2000, use began to decline. In the Lower Division States, the decline began after adoption of the Interim Surplus Guidelines in 2001, which brought California's water use to within its apportionment. After adoption of the 2007 Interim Guidelines, Lower Division States began significant conservation efforts, and drought-response

activities since their adoption have resulted in continued reductions in use. The first year of shortages under the 2007 Interim Guidelines occurred in 2022. Evaporation and other losses declined between 2000 and 2024 because evaporation decreases as Lake Powell and Lake Mead elevations decline.

1.8.4 System Reservoirs and Diversion Facilities

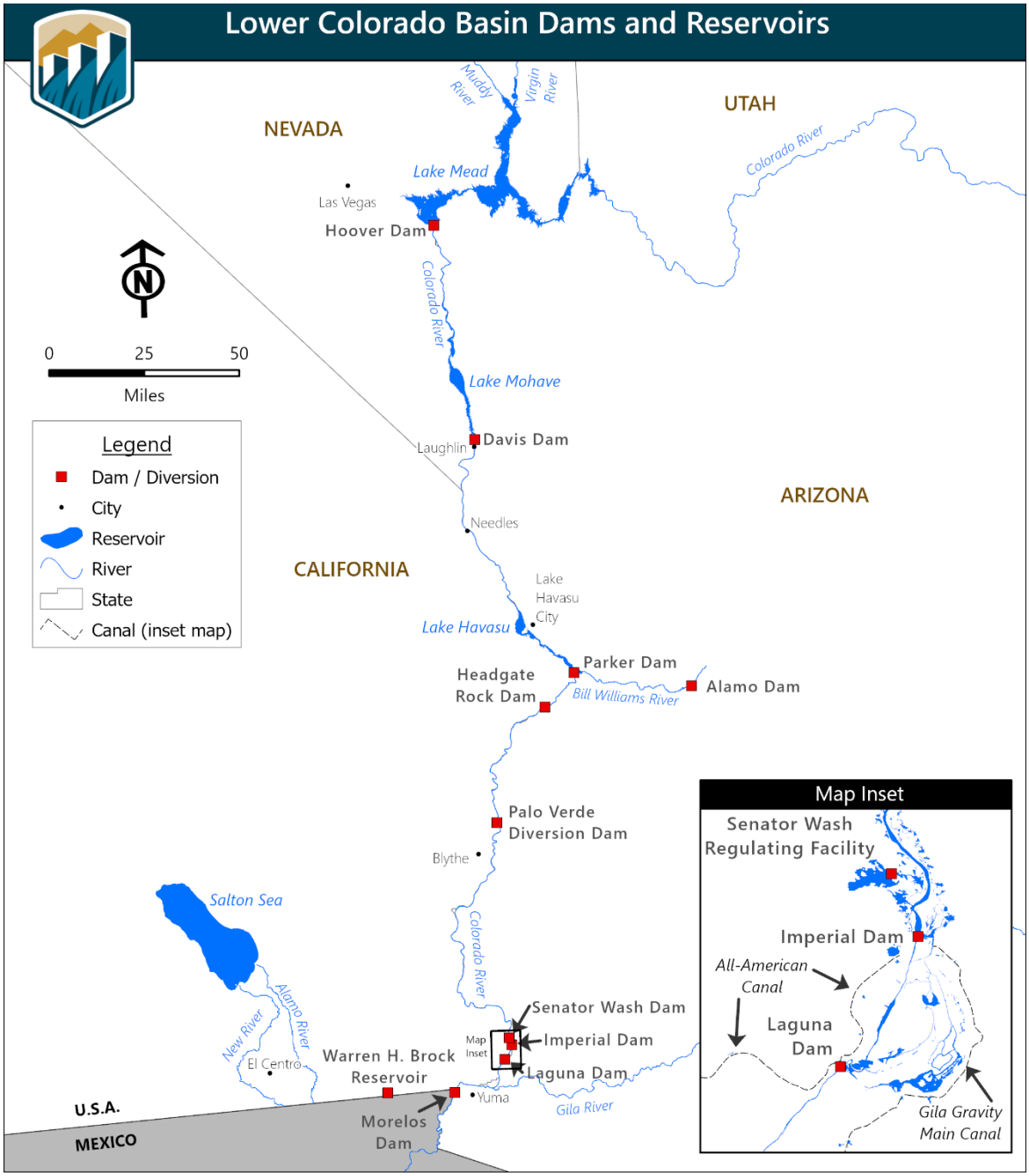
The Colorado River System contains numerous reservoirs that provide an aggregate of approximately 60.0 maf of storage (or roughly the same amount of four years of average flow of the Colorado River). Of these reservoirs, Lake Powell and Lake Mead provide approximately 85 percent of this storage. Lake Powell, formed by Glen Canyon Dam, provides 24.3 maf of this storage.

The Lower Basin dams and reservoirs include Hoover Dam, Davis Dam, and Parker Dam (**Figure 1-4**). Lake Mead, formed by Hoover Dam, can store up to 26.1 maf (27.6 maf at full pool less 1.5 maf of exclusive flood control space). Davis Dam was constructed by Reclamation to re-regulate Hoover Dam's releases and to aid in the annual delivery of 1.5 maf to Mexico. Davis Dam created Lake Mohave and provides 1.8 maf of storage. Parker Dam formed Lake Havasu (0.65 maf of storage) from which water is pumped by both Metropolitan Water District of Southern California (MWD) and the CAP. Parker Dam re-regulates releases from Davis Dam and from the U.S. Army Corps of Engineers' (USACE's) Alamo Dam on the Bill Williams River, and in turn releases water for downstream use in the U.S. and Mexico. Other Lower Basin mainstream reservoirs, shown on **Figure 1-4**, are operated primarily for the purpose of river flow regulation to facilitate diversion of water to Arizona, California and Mexico. Diversion facilities of the Lower Division states typically serve multiple entities.

There are several points of diversion in Arizona. Arizona can use up to 50,000 afy of water under its Upper Basin apportionment. In the Lower Basin, the largest diversion for Arizona is the CAP pumping plant on Lake Havasu downstream of the confluence of the Bill Williams River. Irrigation water for the Fort Mojave Indian Reservation, near Needles, California, is pumped from both wells and pumps along the river channel. There are also several other municipal, industrial and agricultural water users located along the Colorado River that pump their water from wells. Irrigation water for the Colorado River Indian Reservation near Parker, Arizona, is diverted at Headgate Rock Dam, which was constructed for that purpose. A river pumping plant in the Cibola area provides water to irrigate lands adjacent to the Colorado River. The last major diversion for Arizona occurs at Imperial Dam, where water is diverted into the Gila Gravity Main Canal for irrigation for the Gila and Wellton-Mohawk projects and into the AAC for subsequent release into the Yuma Main Canal for the Yuma Project and the City of Yuma.

California receives most of its Colorado River water at three diversion points: MWD's pumping plant on Lake Havasu; the Palo Verde Irrigation District's diversion at the Palo Verde Diversion Dam near Blythe, California; and the AAC diversion at Imperial Dam (**Figure 1-4**).

Figure 1-4
Lower Basin Dams and Reservoirs



In Nevada, the state's consumptive use apportionment of Colorado River water is used almost exclusively for municipal and industrial (M&I) purposes. About 90 percent of this water is diverted from Lake Mead at a point approximately five miles northwest of Hoover Dam at Saddle Island by the Southern Nevada Water Authority (SNWA) facilities. The remainder of Nevada's diversion occurs downstream of Davis Dam in the Laughlin, Nevada area and on the Fort Mojave Indian Reservation.

1.8.4.1. Critical Infrastructure Considerations at Glen Canyon Dam

Glen Canyon Dam is a National Critical Infrastructure site. Full pool is at 3,700 feet, and dead pool is at 3,370 feet (see **Figure 1-5**). There are two mechanisms for releasing water through the dam (see **Figure 1-6**). The penstocks route water through turbines in the hydropower generating plant, and the river outlet works route water through four jet tubes. The bottom of the intake for the penstocks is at elevation 3,490 feet, meaning that this is the minimum power pool elevation. The bottom of the intake for the river outlet works is at elevation 3,370 feet (this elevation is considered "dead pool").

Glen Canyon Dam was not envisioned to operate below minimum power pool (elevation 3,490 feet). Below this elevation, water cannot be released through the penstocks and must instead be released through the jet tubes at the end of the river outlet works. Infrastructure concerns associated with extended operations through the river outlet works include damage to the outlet works pipes at low reservoir elevations, erosion at the downstream base of the dam from outlet works operation, and the potential for additional unknown issues from operating the outlet works for extended periods. Any one of these factors could compromise the safety and stability of Glen Canyon Dam and affect the ability to meet critical downstream water supply needs.

Figure 1-5
Glen Canyon Dam Key Elevations

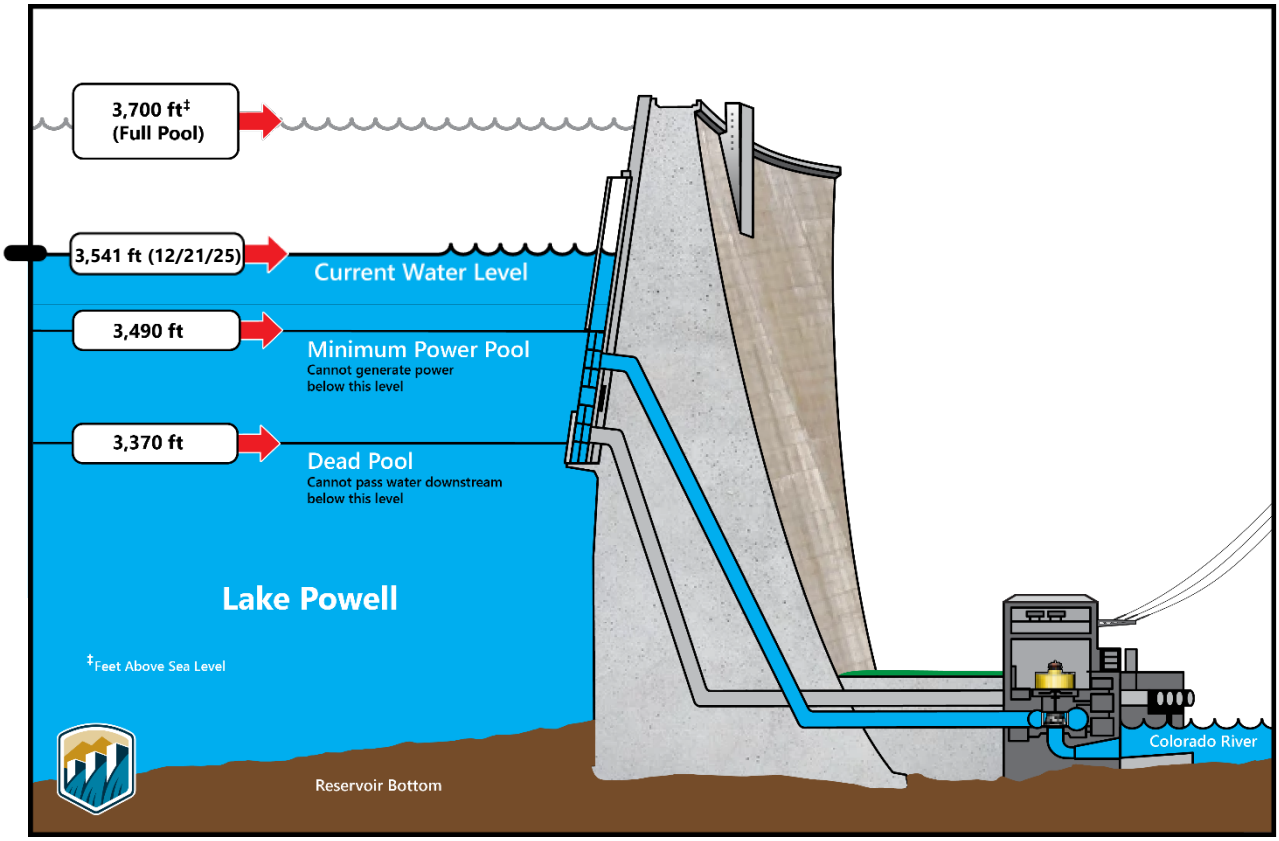
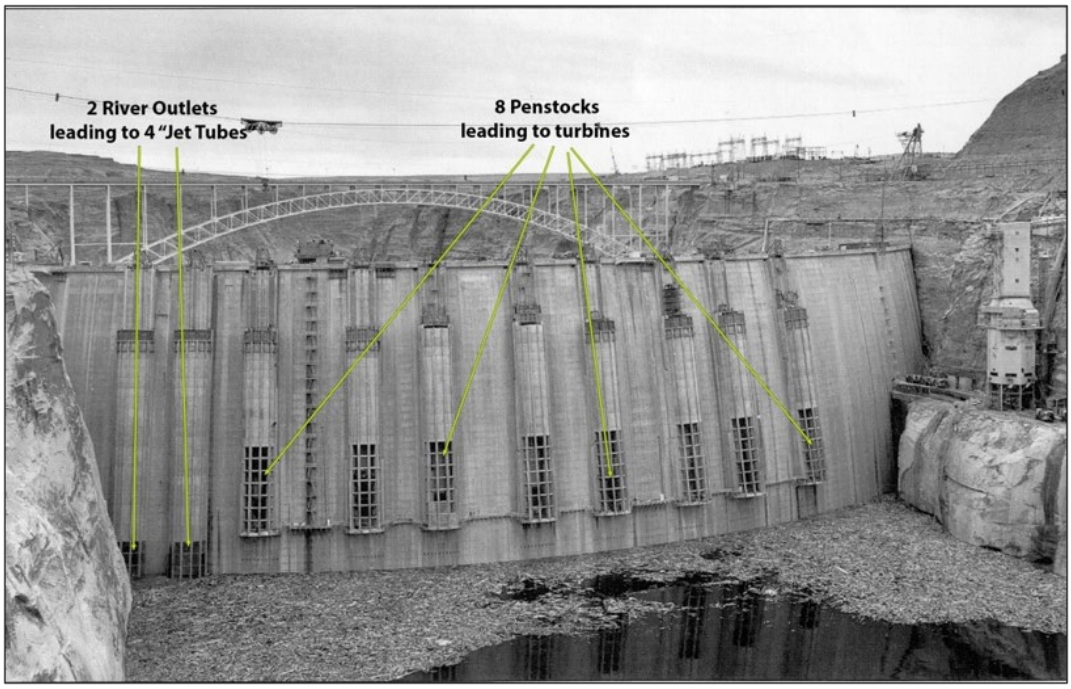


Figure 1-6
Glen Canyon Dam in 1963 (Before Filling)



1.8.4.2. Critical Infrastructure Concerns at Hoover Dam

Hoover Dam is a National Critical Infrastructure site. Full pool is elevation 1,229 feet, and dead pool is elevation 895 feet (see **Figure 1-7**). There are two mechanisms for releasing water through the dam (see **Figure 1-8**). There are four intake towers, two on both sides of the dam, that draw water to four penstocks. These penstocks route water through the turbines in the hydropower generating plant and can also route water to two sets of river outlet works. If the reservoir is above elevation 1,205 feet, water can also be moved through two spillways, one on each side of the dam. However, normal operating practice is to not pass water through the spillways until the reservoir is nearly full (at elevation 1,221 feet) for flood control purposes. Minimum power pool elevation is estimated to be 950 feet and the bottom of the intake towers for the penstocks is elevation 895 feet (this elevation is considered "dead pool" at Hoover Dam). Below elevation 950 feet, water can no longer be passed through the turbines and can only be passed through the river outlet works, resulting in release constraints at low elevations. The Hoover Dam hydropower plant has 17 total hydropower turbines including five wide-head turbines. All 17 turbines can generate power down to elevation 1,035 feet, but only the 5 wide-head turbines can continue to produce power below 1,035 feet to 950 feet. It is estimated that there would be a 70-percent loss of total generation capacity below elevation 1,035 feet.

Figure 1-7
Hoover Dam Key Elevations

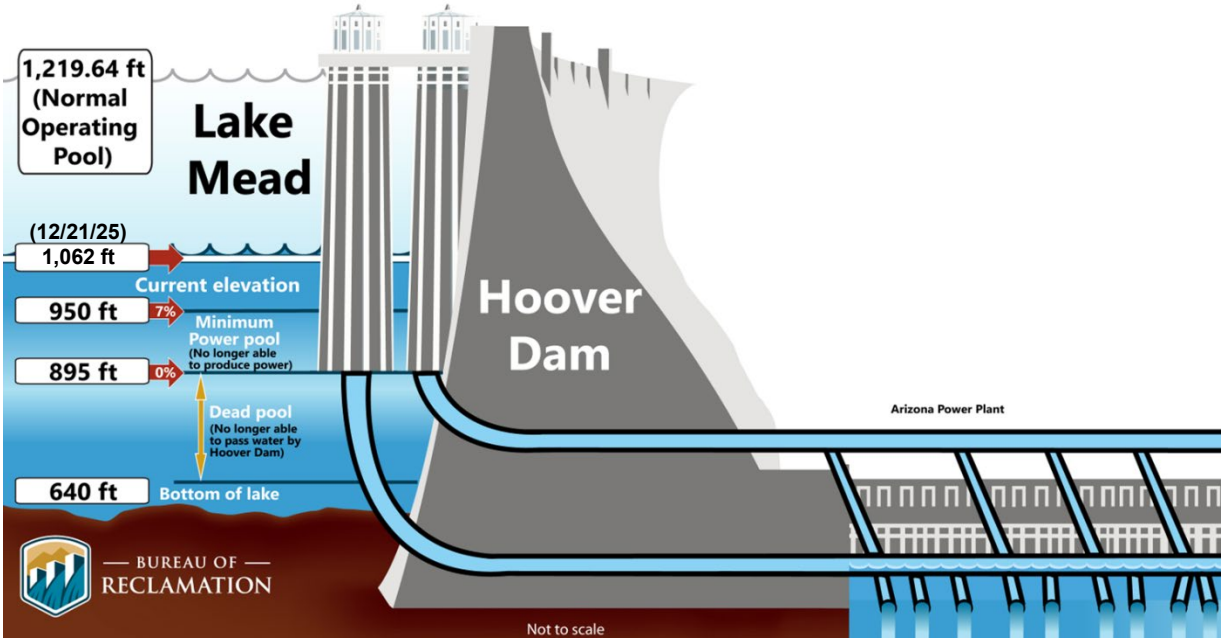
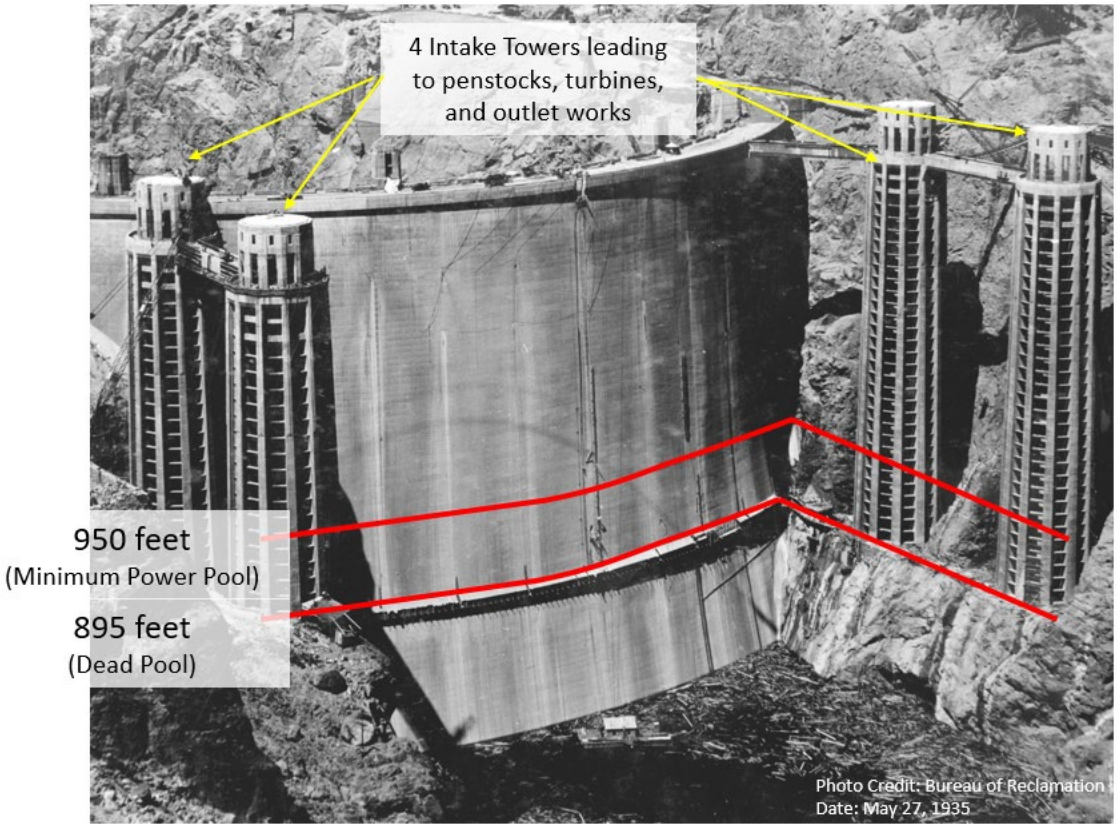


Figure 1-8
Hoover Dam in 1935 (before filling]



1.8.5 Flood Control Operation

Under the BCPA, flood control is specified as the project purpose having first priority for the operation of Hoover Dam. Subsequently, Section 7 of the Flood Control Act of 1944 established that the Secretary of War (now the USACE) will prescribe regulations for flood control for projects authorized wholly or partially for such purposes.

The Los Angeles District of the USACE published the current flood control regulations in its Water Control Manual for Flood Control, Hoover Dam and Lake Mead, Colorado River, Nevada and Arizona (Water Control Manual) dated December 1982. The Field Working Agreement between the USACE and Reclamation for the flood control operation of Hoover Dam and Lake Mead, as prescribed by the Water Control Manual, was signed on February 8, 1984. The flood control plan is the result of a coordinated effort between the USACE and Reclamation; however, the USACE is responsible for providing the flood control regulations and has authority for final approval. The Secretary is responsible for operating Hoover Dam in accordance with these regulations. Deviation from the flood control operating criteria must be authorized by the USACE.

1.8.6 Hydropower Generation

Reclamation is authorized by legislation to produce electric power at Glen Canyon Dam, Hoover Dam, Davis Dam, Parker Dam, and other smaller facilities. While Reclamation is the federal agency authorized to produce power at the major Colorado River system dams, WAPA is the federal agency authorized to market and deliver this power. WAPA enters into electric service contracts on behalf of the U.S. with public and private utility systems for distribution of hydroelectric power produced at Reclamation facilities in excess of project demand. Glen Canyon, Hoover, Davis, and Parker Dams have a maximum combined capacity of approximately 3,769 MW, which WAPA markets to more than 182 customers across Arizona, California, Colorado, Nebraska, Nevada, New Mexico, Utah, and Wyoming.

1.8.7 Long Range Operating Criteria and AOP

The CRBPA required the Secretary to adopt operating criteria for the Colorado River by January 1, 1970. The LROC, adopted in 1970, address operation of the Colorado River reservoirs in compliance with requirements set forth in the Compact, the CRSPA, the BCPA, the 1944 Water Treaty, and other applicable federal laws. Section 602 of the CRBPA, as amended, provides that the LROC can only be modified after correspondence with the governors of the Basin States and appropriate consultation with such state representatives as each governor may designate. The LROC calls for formal reviews at least every five years. The reviews are conducted as a public involvement process and are attended by representatives of federal agencies, the seven Basin States, Indian tribes, the general public including representatives of the academic and scientific communities, environmental organizations, the recreation industry, and contractors for the purchase of federal power produced at federal hydropower plants in the Basin. Per Section 7.D. of the ROD, the 2007 Interim Guidelines were considered an implementation of the LROC. In 2020, the 2007 Interim Guidelines underwent an extensive formal review (Reclamation 2020).

Under the applicable provisions of the CRBPA, the Secretary makes annual determinations in the AOP regarding the availability of Colorado River water for deliveries to the Lower Division states. A requirement to equalize storage between Lake Powell and Lake Mead when there is sufficient

storage in the Upper Basin is also included in the LROC, as required by the CRBPA. Equalization releases are made if: 1) the end of the water year (WY) storage forecast for Lake Powell is greater than that of Lake Mead; and 2) the storage forecast for the end of the WY in the Upper Basin reservoirs is greater than the quantity of storage required by Section 602(a) of the CRBPA (602(a) storage) for that same date.

The 602(a) storage quantity is the storage in the Upper Basin necessary to assure Lower Basin delivery obligations without impairing consumptive use requirements in the Upper Basin. The LROC offers factors to be considered to determine 602(a) storage but does not present a set formula. The factors to be considered include the historical stream flows, the most critical period of record, probability of available waters, and estimated future depletions in the Upper Basin.

In 2004, Reclamation adopted an interim 602(a) storage guideline, in effect through 2026, which establishes that Lake Powell's elevation must be above 3,630 feet (which corresponds to storage of approximately 14.85 maf) for equalization releases to occur (Reclamation 2004). The 2007 Interim Guidelines included an Equalization Tier defined by an elevation schedule that would be used in determining when equalization releases would be made from Lake Powell (generally called the "Equalization Line"). In the event that the elevation of Lake Powell is below the 602(a) storage guideline, and equalization is not required, the LROC provide that "the objective shall be to maintain a minimum release of water from Lake Powell of 8.23 maf for that year."

In the AOP, the Secretary is required to report on the determination of when Normal, Surplus, or Shortage conditions occur in the lower Colorado River, based on various factors including storage and hydrologic conditions in the Basin.

1.8.7.1. Normal Water Supply Condition

A Normal Condition exists when the Secretary determines that sufficient mainstream water is available to satisfy 7.5 maf of annual consumptive use in the Lower Division States. If a state will not use all of its apportioned water for the year, the Secretary may allow other states of the Lower Division to use the unused apportionment, provided that the use is authorized by a water delivery contract with the Secretary.

1.8.7.2. Surplus Water Supply Condition

A Surplus Condition exists when the Secretary determines that sufficient mainstream water is available for release to satisfy consumptive use in the Lower Division states in excess of 7.5 maf annually. This excess consumptive use is surplus and is distributed for use in Arizona, California, and Nevada pursuant to the terms and conditions provided in the Interim Surplus Guidelines (ISG), adopted in 2001, as modified by the 2007 Interim Guidelines. Other than 70(R) and flood control surplus determinations, surplus guidelines expire with the expiration of the 2007 Interim Guidelines.

In general terms, under the 2007 Interim Guidelines, the availability of surplus water is determined by the elevation of Lake Mead. When Lake Mead is full and Reclamation is making flood control releases, surplus supplies are unlimited. As Lake Mead's elevation drops, surplus water amounts are reduced and ultimately eliminated.

If a state does not use all of its apportioned water for the year, the Secretary may allow other Lower Division States to use the unused apportionment, provided that the use is authorized by a water delivery contract with the Secretary.

1.8.7.3. Shortage Water Supply Condition

A Shortage Condition exists when the Secretary determines that insufficient mainstream water is available to satisfy 7.5 maf of annual consumptive use in the Lower Division States. When making a shortage determination, the Secretary must consult with various parties as set forth in the Consolidated Decree and consider all relevant factors as specified in the LROC, including 1944 Water Treaty obligations, the priorities set forth in the Consolidated Decree, and the reasonable consumptive use requirements of mainstream water users in the Lower Division states.

Pursuant to the Consolidated Decree, the Secretary is required to first provide for the satisfaction of the PPRs in the order of their priorities without regard to state lines. Pursuant to the CRBPA, water contract holders in Arizona with contracts dated September 30, 1968 (when the CAP was authorized) or later, have a lower priority than California's 4.4 maf apportionment. Beyond these two requirements, the Department does not have detailed guidelines in place that define the circumstances under which the Secretary would reduce the annual amount of water available for consumptive use from Lake Mead, i.e., when water supplies would be reduced, by how much, or who would experience specified reductions.

In the absence of specific shortage criteria, a shortage determination would most likely be made on an annual basis through the AOP process. This is a process by which the interests of the different stakeholders are addressed through consultation. In this consultation process, water users who rely on the Colorado River in the Lower Division States would not be able to identify in advance particular reservoir conditions under which the Secretary would reduce the annual amount of water available for consumptive use from Lake Mead, nor would they be able to understand the frequency or magnitude of any potential future annual reductions in their water deliveries.

1.9 Related Actions

The alternatives considered in this Draft EIS address operation and storage of water in Lake Powell and Lake Mead. Water users across the Basin may rely on operations at Lake Powell and Lake Mead to address their specific uses, which may involve Reclamation or may be independent from any Reclamation action. Reclamation will address such operations in this NEPA analysis for which Reclamation would be responsible to the extent they are known.

Additionally, some actions by Reclamation in the Colorado River address different aspects of Colorado River operations and either will not be affected by the proposed action or, if affected by the proposed action, any effects will depend on the outcome of this NEPA process. Actions dependent on the outcome of this NEPA process will be addressed through later NEPA processes

if needed. The primary documents that are related to, or would assist the reader in understanding the issues analyzed in the process, are:

- Off-stream Storage of Colorado River Water and Development and Release of Intentionally Created Unused Apportionment in the Lower Division States – 43 CFR pt. 414 (1999);
- Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions - Final EIS (Reclamation 2002) and ROD - Colorado River Water Delivery Agreement (Reclamation 2003);
- Lower Colorado River Multi-Species Conservation Program - Final Programmatic EIS/Environmental Impact Report (Reclamation 2004) and ROD - Lower Colorado River Multi-Species Conservation Plan (LCR MSCP) (Reclamation 2005);
- CRSP Upper Initial Units RODs (Reclamation 2006a, 2006b, 2012);
- 2007 Interim Guidelines (Reclamation 2007a) and Near-term Colorado River Operations, Final Supplemental Environmental Impact Statement (SEIS) (Reclamation 2024a);
- LTEMP – Final EIS (Reclamation 2016) and LTEMP - Final SEIS (Reclamation 2024b) determine sub-annual releases from Glen Canyon Dam; and
- 2019 Colorado River DCPs (Reclamation 2019).

The actions documented in the references listed above are summarized below.

1.9.1 Off-stream Storage of Colorado River Water and Development and Release of Intentionally Created Unused Apportionment in the Lower Division States

In 1999, the Department adopted a rule to facilitate off-stream storage of Colorado River water and development and release of "Intentionally Created Unused Apportionment" for the Lower Division states. Reclamation prepared an Environmental Assessment to assess the environmental impacts of the rule, and a Finding of No Significant Impact was issued on October 1, 1999. The final rule was published in the Federal Register on November 1, 1999, and is codified at 43 CFR pt. 414.

This rule establishes a procedural framework within the Lower Basin states for an authorized entity in one state to enter into storage agreements with authorized entities in another state for the off-stream storage (and future recovery) of Colorado River water. Under the agreements, the storing state will use water it stores under an interstate agreement and, in return, at a future date, decrease its consumptive use of Colorado River water, thereby developing the ICUA that the Secretary will release for consumptive use in the consuming state. Under this rule, two Storage and Interstate Release Agreements (SIRAs) have been executed to date.[17]

1.9.2 Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions – Final EIS and ROD – Colorado River Water Delivery Agreement

California's Colorado River Water Use Plan calls for conservation measures to be put in place that will reduce California's historical dependency on Colorado River water in excess of the state's

[17] SIRA Contract No. 02-XX-30-W0406 was entered into on December 18, 2002, among Nevada, Arizona, and the U.S.; SIRA Contract No. 04-XX-30-W0430 was entered into on October 27, 2004, among Nevada, California, and the U.S.

4.4 maf apportionment. The Colorado River Water Delivery Agreement, signed by the Secretary on October 10, 2003, provides for implementation of major components of California's Colorado River Water Use Plan and incorporates contractual agreements that facilitate California's sharing and distribution of Colorado River water within its 4.4 mafy entitlement.

The Colorado River Water Delivery Agreement is the Secretary's agreement to make those Colorado River water deliveries specified in the agreements with the relevant California entities. These agreements provide for the conservation and transfer of about 400 kaf of water annually among the Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), MWD, and San Diego County Water Authority.

1.9.3 Lower Colorado River Multi-Species Conservation Program

The LCR MSCP is a 50-year cooperative effort between federal and non-federal entities, approved by the Secretary in April 2005. The LCR MSCP provides ESA compliance for specific covered federal actions and non-federal activities under ESA Sections 7 and 10. The LCR MSCP provides ESA coverage for non-federal actions that are related to the use and management of the lower Colorado River.

In addition to the covered activities of the non-federal LCR MSCP entities, specific present and potential future actions of six federal agencies on the lower Colorado River are also included in the LCR MSCP. Those federal agencies are Reclamation, BIA, NPS, Bureau of Land Management (BLM), WAPA, and FWS. These federal agencies and non-federal entities are collectively referred to as the LCR MSCP participants. The covered actions and activities for the LCR MSCP participants occur along the lower Colorado River in Imperial, Riverside, and San Bernardino counties, California; La Paz, Mohave, and Yuma counties, Arizona; and Clark County, Nevada. The duration of the Section 10 permit and the associated formal ESA Section 7 consultation for the federal agencies is 50 years (2005 to 2055).

The LCR MSCP is intended to avoid, minimize, and fully mitigate the incidental take of the covered species from the implementation of the covered activities to the maximum extent practicable. The EIS will evaluate operational interactions without altering LCR MSCP commitments. The LCR MSCP is being revisited in a separate process that will be finalized following the signing of the Post-2026 ROD.

1.9.4 Colorado River Storage Project Upper Initial Units RODs

The 1956 CRSPA authorized construction of the CRSP "to initiate the comprehensive development of the water resources of the Upper Basin, for the purposes, among others, of regulating flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes…"

There are four initial storage units built as part of the CRSP. The Glen Canyon Unit is the furthest downstream. The three upper initial units are Flaming Gorge Unit in Utah, Wayne N. Aspinall Unit in Colorado (Blue Mesa, Crystal, and Morrow Point Dams), and Navajo Unit in New Mexico (see **Map 1-1**). The current RODs governing operations of these units were signed in 2006, 2012, and 2006, respectively. Each ROD sets a range of releases from the unit with the goal of meeting flow and/or temperature recommendations.

With the adoption of the 2019 DCP, which included the Drought Response Operations Agreement (DROA), a specific operational mechanism was established for releases from the CRSP Upper Initial Units, if needed, to protect Lake Powell elevations and the ability of the Upper Division States to meet Compact compliance obligations while exercising their rights to develop and utilize Colorado river water. Releases from the CRSP Upper Initial Units implemented to date pursuant to the DROA have occurred within the scope of the existing RODs for the respective facilities.

This Draft EIS evaluates alternatives that contemplate the potential continued use of the CRSP Upper Initial Units for Lake Powell protection in a manner intended to remain within the scope of those existing RODs. While the Secretary will consider and prioritize operations at these facilities that are consistent with existing RODs, the Secretary retains the authority to operate outside those RODs if necessary. The modeling assumptions regarding operation of the CRSP Upper Initial Units presented in this Draft EIS are not intended to, and do not, limit the Secretary's ability to operate these facilities as necessary to respond to hydrologic conditions in accordance with applicable federal law, including operations for the authorized purposes stated at the beginning of this section.

1.9.5 2007 Interim Guidelines

Spurred by an ongoing multi-year drought, decreasing system storage, and growing demands for Colorado River water, in December 2007, the Secretary approved the ROD for the 2007 Interim Guidelines. The Guidelines, which are anticipated to be in place for an interim period through 2026, provide operating criteria for Lake Powell and Lake Mead including provisions designed to provide a greater degree of certainty to water users about timing and volumes of potential water delivery reductions, and additional operating flexibility to conserve and store water in the system. The interim nature of the Guidelines provided the opportunity to gain valuable experience for the management of Lake Powell and Lake Mead under modified operations and improve the basis for making future operational decisions, whether during the interim period or after.

The Guidelines are comprised of four operational elements collectively intended to address the purpose. These elements are as follows:

- **Shortage Guidelines:** Determines those conditions under which the Secretary would reduce the annual amount of water available for consumptive use from Lake Mead to the Lower Division states below 7.5 maf pursuant to the Consolidated Decree.
- **Coordinated Reservoir Operations:** Defines the coordinated operations of Lake Powell and Lake Mead to provide improved operation of these two reservoirs, particularly under low reservoir conditions. As described in Section XI.G.6. of the ROD, the objective of the operation of Lake Powell and Lake Mead is "to avoid curtailment of uses in the Upper

Basin, minimize shortages in the Lower Basin and not adversely affect the yield for development available in the Upper Basin."

- **Storage and Delivery of Conserved Water**: Allows for the storage and delivery, pursuant to applicable federal law, of conserved Colorado River System and non-System water in Lake Mead to increase the flexibility of meeting water use needs from Lake Mead, particularly under drought and low reservoir conditions. Delivery of water conserved pursuant to the 2007 Interim Guidelines will continue beyond 2026.
- **Surplus Guidelines:** Determines those conditions under which the Secretary may declare the availability of surplus water for use within the Lower Division states. Modifies the substance of the ISG existing at the time the Guidelines were adopted by extending the term from 2016 to 2026 and terminating the most permissive provision.

Except for the special provisions described in Section XI.G.8. of the ROD, the Guidelines remain in effect through December 31, 2025 (through preparation of the 2026 AOP).

1.9.6 Operation of Glen Canyon Dam – Long-Term Experimental and Management Plan

In contrast to the annual releases determined through the Interim Guidelines, the LTEMP determines sub-annual releases from Glen Canyon Dam. The LTEMP identifies specific options for dam operations (including hourly, daily, and monthly release patterns), non-flow actions, and appropriate experimental and management actions that meet the Grand Canyon Protection Act's requirements and maintain or improve hydropower production to the greatest extent practicable, consistent with improvement of downstream environmental and cultural resources, including those of importance to tribes. While the Post-2026 process will consider LTEMP's implications for Glen Canyon Dam management, it will not modify decisions made in the LTEMP ROD. Decisions made in the LTEMP ROD will likely be revisited following the signing of the Post-2026 ROD.

1.9.7 2019 Colorado River Drought Contingency Plans

Consistent with and pursuant to provisions in the 2007 Seven States' Agreement and the 2007 Interim Guidelines, the Reclamation and the Basin States have regularly consulted regarding various issues that have arisen during implementation of the 2007 Interim Guidelines. In 2019, recognizing that those relying on water from the Colorado River system faced increased individual and collective risk of temporary or prolonged interruptions in water supplies, with associated adverse impacts on the society, environment, and economy of the Basin, the Basin States agreed that it was necessary and beneficial to pursue additional actions beyond those contemplated in the 2007 Interim Guidelines to reduce the likelihood of reaching critical elevation levels in Lake Powell and Lake Mead through 2026. Two DCPs were developed: the Upper Basin Drought Contingency Plan (Upper Basin DCP), which affects operations above Lee Ferry, and the Lower Basin Drought Contingency Plan (Lower Basin DCP), which affects operations below Lee Ferry. The Agreement Concerning Colorado River Drought Contingency Management and Operations is an overarching agreement between the Basin States and the Department where the parties agree to consultative and cooperative processes during implementation of the Upper Basin DCP and the Lower Basin DCP, similar to the 2007 Seven States' Agreement. The 2019 DCPs are supplemental to and in furtherance of the goals of the 2007 Interim Guidelines.

While most provisions of the DCPs expire at the end of 2026, certain provisions related to intentionally created surplus (ICS) recovery, Upper Basin demand management, and recovery of storage extend beyond 2026. The Draft EIS alternatives contain modeling assumptions regarding the delivery of pre-2027 ICS that are both in accordance with these provisions and provide additional flexibilities.