



American Whitewater
PO Box 63
Springfield, OR 97477

March 2, 2026

Scott Cameron
Acting Commissioner
Bureau of Reclamation
Attn: BCOO-1000
P.O. Box 61470
Boulder City, NV 89006
Sent via email: crbpost2026@usbr.gov

RE: Comments on the Draft Environmental Impact Statement for Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead

Dear Mr. Cameron:

American Whitewater appreciates the opportunity to provide substantive comments on the Draft Environmental Impact Statement for Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead (Post-2026 Operations).

American Whitewater is a national non-profit 501(c)(3) river conservation organization founded in 1954 with approximately 50,000 supporters, 7,000 dues-paying members, and 80 local-based affiliate clubs, representing whitewater enthusiasts across the nation. American Whitewater's mission is to protect and restore America's whitewater rivers and to enhance opportunities to enjoy them safely. The organization is the primary advocate for the preservation and protection of whitewater rivers throughout the United States, and connects the interests of human-powered recreational river users with ecological and science-based data to achieve the goals within its mission. Our vision is that our nation's remaining wild and free-flowing rivers stay that way, our developed rivers are restored to function and flourish, that the public has access to rivers for recreation, and that river enthusiasts are active and effective river advocates.

Since the origination of American Whitewater in 1954, we have been involved in issues related to the Grand Canyon and water management in the Colorado River Basin (Basin). We have participated in the Post-2026 Operations process, including submitting comments on the pre-scoping phase and the preliminary alternatives phase, presenting at the 2023 Colorado River Water User's Association Conference in Las Vegas, and participating in meetings with the

Bureau of Reclamation (Reclamation) to discuss impacts of Post-2026 Operations on the rivers throughout the Basin. In the below letter, American Whitewater provides substantive comments on the Post-2026 Operations process and proposed alternatives for long-term management of Lake Powell and Lake Mead. American Whitewater *does not* provide support for any particular alternative presented in the DEIS. Instead, we provide constructive input on aspects of the alternatives and specific comments on how the impact analysis for environmental resources needs improvement prior to the Final EIS and Final Record of Decision (ROD).

Comments on Public Process and Alternative Development

The lack of agreement between the basin states on water cuts severely limits the viability of the proposed alternatives to the No Action or Basic Coordination alternatives.¹ Both of these alternatives have unacceptable outcomes for the river and water delivery infrastructure in the short and long term. Based on current negotiations, it is clear that the basin states will either not come to an agreement before the Final ROD is signed *or* if they do, it is very likely to include major differences from the alternatives described and analyzed in the DEIS. Therefore, the public and key stakeholders, including American Whitewater, have been given an incomplete proposal to provide informed comments on. If a basin-state agreement is reached later in 2026 there will be no opportunity or severely limited opportunity to respond to the proposed management alternative prior to the release of the FEIS. If Reclamation makes substantial changes to the proposed action between the Draft EIS and Final EIS that are relevant to environmental concerns, or relies on significant new information not previously disclosed for public review (such as a new alternative proposed by the Basin states), NEPA requires preparation of a supplemental EIS subject to public review.² Failure to provide an opportunity for public review of such material changes risks undermining the adequacy of the NEPA process and increasing the likelihood of administrative objections and judicial challenges to the Final EIS and Record of Decision.

The Post-2026 operations process has been plagued with closed door negotiations resulting in missed deadlines. American Whitewater is appreciative of the opportunity to engage in the public process and share perspectives on how operations of infrastructure on the Colorado River affects our community, however, with decision making left in the hands of the states, the validity of this important democratic process is impacted. American Whitewater understands that this reality is not the fault of Reclamation. However, in the face of imminent threats of failing infrastructure, it is time for the leadership to take bold steps to a new way of managing the river that is inclusive of those who rely on it.

¹ U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Executive Summary at ES-8 (2026).

² 40 C.F.R. § 1502.9(d)(1); *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 374 (1989)

Process and inclusion matter in decision making frameworks. History has established the current framework that is clearly not functioning properly. We urge Reclamation to take leadership and ensure the river and unmatched landscapes it shaped is protected for future generations. Because of the threat to those resources we include the following comment on the urgent need to reimagine how Colorado River flows reach the Grand Canyon.

Recommendation

1. Reclamation must provide a supplemental opportunity for public input if substantive changes are made to the proposed alternatives prior to the publication of the FEIS, including if a new alternative is proposed by the Basin states.
2. If the states do not reach a sustainable solution, Reclamation must take all the actions within its power to ensure that the Colorado River remains a functioning, living river in both the short and long term.

Comments on Urgent Need for Alternatives Analysis of Modifications to Glen Canyon Dam

A central but insufficiently analyzed risk in the Draft Environmental Impact Statement is the reliability of Glen Canyon Dam's River Outlet Works (ROW) as the sole release mechanism when Lake Powell falls below minimum power pool, elevation 3,490 feet.

The Draft EIS evaluates the likelihood of Lake Powell falling below elevation 3,500 feet, an analytical buffer above minimum power pool.³ However, it does not meaningfully evaluate the operational consequences of prolonged releases exclusively through the ROW below 3,490 feet. Reclamation's own March 26, 2024 Technical Decision Memorandum concludes that reliance on the ROW as the sole means of sustained releases below 3,490 feet is not prudent due to uncertainty in long-term performance, cavitation risk, sediment redistribution, and mechanical reliability concerns.⁴

This omission is significant. Several alternatives analyzed in the DEIS present a realistic probability that Lake Powell could approach or fall below minimum power pool under hydrologic conditions that have occurred repeatedly during the modern drought period.⁵ Under those conditions, reliance on the ROW would not be discretionary. It would be mandatory.

³ Bureau of Reclamation, *Draft Environmental Impact Statement, Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead*, Executive Summary, Section ES.4, pp. ES-23–ES-28.

⁴ Bureau of Reclamation, *Establishment of Interim Operating Guidance for Glen Canyon Dam during Low Reservoir Levels at Lake Powell*, Technical Decision Memorandum, March 26, 2024, pp. 1–2, 5–9.

⁵ Bureau of Reclamation, *Draft Environmental Impact Statement, Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead*, Executive Summary, Section ES.4, pp. ES-23–ES-28

A more detailed discussion on American Whitewater's concerns about the need for robust analysis of ongoing operations at Glen Canyon Dam below 3,490 is included in the Dams and Electrical Power Resources section below. It is clear and understandable that dam modifications are outside the scope of this DEIS, however, lacking understanding of potential impacts of unreliable conveyance of water through Glen Canyon Dam leaves the alternatives incomplete by failing to address the cumulative impacts of the action.

Recommendation

1. As soon as it is practical and before the Post-2026 Operations ROD is finalized, Reclamation must initiate a feasibility study for full-scale infrastructure improvements at Glen Canyon Dam.

Comments on Impacts to Resources

Hydrologic Resources

The analysis of impacts to hydrologic resources are discussed throughout the DEIS documents from the Executive Summary (ES) to the Technical Appendices. American Whitewater appreciates that Reclamation included 'critically dry' as an additional hydrological scenario in the DEIS to capture the increasingly low water years that the river basin is experiencing.⁶ The ES states in the purpose and need that the guidelines developed from this process are to be interim in nature, approximately 20 years, leaving the door open for short term strategies that could provide more low water operating experience.⁷ Conversely, to understand the longer term effects of the different alternatives much of the analysis of the affected environment extends to 2060.^{8,9} This incongruity in time horizons assessed is critically important to understand affected resources such as hydropower at Glen Canyon Dam, sensitive species and ecosystems in Grand Canyon, and whitewater recreation as they are highly sensitive to operational changes at the dam. It is helpful to understand how different alternatives fail at different points in time, but using a shifting window obfuscates the effects of reaching critical elevations such as minimum power pool and dead pool.

Effects to hydrologic resources, especially critical elevations at Glen Canyon and Hoover Dams are difficult to compare across the DEIS documents. For example, when reading the ES, three year types are described (average 12-14 maf, dry 10-12 maf, and critically dry 8.07-10 maf) and

⁶ Bureau of Reclamation, *Draft Environmental Impact Statement, Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead*, Executive Summary, Table ES-3.

⁷ *Ibid* Table ES-3.

⁸ *Ibid*. Ch. 3 Affected Environment and Environmental Consequences, Section 2.3.3.

⁹ *Ibid*. Technical Appendix 3 - Hydrological Resources. Pg. 3-28

used for a trade-off analysis of reservoir elevations over a 20 year period.¹⁰ Chapter 3 and the Technical Appendix on Hydrological Resources (TA-3) uses the 2027-2060 (as well as sub-ranges) to assess the likelihood under all modeled scenarios, not year type, that Lake Powell would get below critical elevations 3500' and 3525'. To understand the risk to critical reservoir elevations in a given year, the reader must then use the vulnerability analysis in TA-3 to put the robustness into terms of annual flow volumes. That vulnerability assessment is done based on a 10 year driest average of flow at Lees Ferry. The reader then needs to reference the ES to relate it back to where such annual flow volumes would align with the year types presented in the ES. When assessing the more flexible elevation of 3525' it uses a 20 year driest average. This assortment of both historic hydrologic conditions and modelled future flows makes alternative comparison even more difficult.

The immediate risk to critical reservoir elevations, and thus cascading environmental impacts, is not easily distinguishable as you read through the DEIS documents and is further confused by using changing historic condition periods and lacking year type analysis for the modelled future flows.¹¹ The basin wide snowpack is currently at 63-66% of the 30-year median.¹² The short term risk to Powell elevations and the downstream environment are not appropriately conveyed in the moving target of analysis included in the DEIS.

Recommendation

1. The initial conditions presented in the DEIS no longer reflect the 2025 - 2026 water year, which has shifted to drastically low projections of reaching minimum power pool (3490') before August in the Probable Minimum Inflow scenario and by December in the Most Probable Inflow scenario.¹³ The CRSS initial conditions, which are the basis of the DEIS analysis, include a lowest projected scenario (Trace 14) of 3,511.36' by the end of December 2026.¹⁴ By Reclamation's own calculation, DEIS initial conditions could overproject reservoir levels at Glen Canyon Dam by as much as 41.36'. The FEIS should include updated modeling to reflect these lower initial conditions.
2. Clarity of the time horizons and historical conditions used for assessment should be clearly identified in the figures, relating to year type or annual flow volume could help relate figures to one another across the DEIS documents

¹⁰ *Ibid* pg. ES-21, Figure ES-5

¹¹ *Ibid*. TA-3. Figure TA 3-8 uses the 10-year driest average to identify annual flow volumes that put reservoir levels at risk of dropping below 3500'. Figure TA 3-10 then uses a 20-year driest average at Lees Ferry to show risks of dropping below 3525'.

¹² <https://www.cbrfc.noaa.gov/lmap/lmap.php?interface=mswegrid>

¹³ <https://www.usbr.gov/lc/region/g4000/riverops/24ms-projections.html>

¹⁴ <https://www.usbr.gov/ColoradoRiverBasin/post2026/draft-eis/docs/vol-2/P26-DEIS-Appendix-G.pdf>

Lake Powell Infrastructure Protection Releases

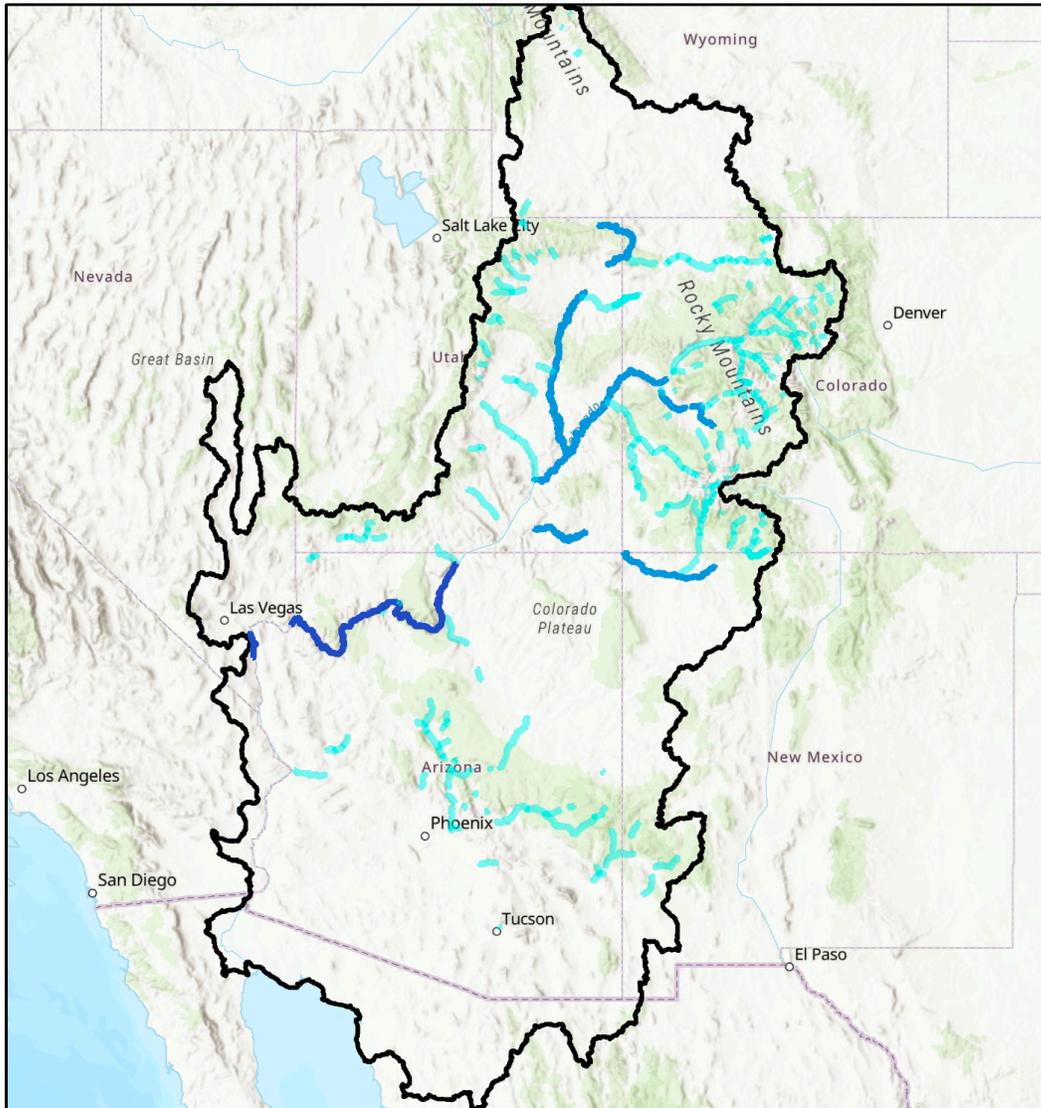
The Continued Current scenario, Basic Coordination Alternatives and Supply Driven alternatives all contemplate releases from the Colorado River Storage Project Upper Initial Units (CRSP UIU).¹⁵ The DEIS is clear that contemplating releases from CRSP Initial Units doesn't expand the geographic scope as any releases would be in accordance with the RODs for each unit. These releases would have significant impacts on the endangered species, the environment and recreational resources below the CRSP UIUs. There are highly sought after river recreational reaches below each of the UIUs that would be impacted by these releases. Please see the map in Figure 1 below illustrating the breadth of whitewater boating opportunities potentially impacted by actions identified in the DEIS.

Recommendation

1. The DEIS analysis should include how the modeled releases can be accomplished under existing RODs and if they can feasibly recur at the magnitude modeled. Identification of potential downstream impacts should be identified.

¹⁵ *Ibid.* Appendix O Analysis of Lake Powell Infrastructure Protection Releases. Section O-1.

Colorado River Basin Recreation Segments

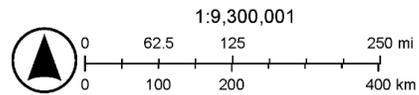


3/2/2026

Impacts to River Recreation in the Colorado River Basin

- █ River Recreation in DEIS Scope
- █ Directly Influenced by CRSP Operations
- █ River Recreation in Colorado River Basin
- Colorado River Basin

World_Hillshade



Funding for the Watershed Boundary Dataset (WBD) was provided by the USDA-NRCS, USGS and EPA along with other federal, state and local agencies. Representatives from many agencies contributed a substantial amount of time and salary towards quality review and updating of the dataset in order to meet the WBD Standards. Acknowledgment of the originating

Kestrel Kunz, American Whitewater

Figure 1. Map depicting river recreation opportunities in the Colorado River Basin, demonstrating which river segments are directly impacted by CRSP UIU operations and which river segments are directly located in or are directly impacted by the DEIS scope.

Recreation

The analysis for recreational impacts is problematic for multiple reasons, though we recognize it has improved slightly from the metrics provided in the Preliminary Alternatives Report. Incorrect flow thresholds are used to assess how river recreational opportunities in the Grand Canyon will be impacted and incorrect assumptions are made regarding the relevance of the timing of releases from Glen Canyon Dam. Due to this incorrect and incomplete analysis, the true economic, social, and intrinsic impacts to recreational opportunities are not fully understood nor communicated to the public in the DEIS.

Significant impacts to the river recreation industry in the Grand Canyon happen below 10,000 cfs recorded at the Lee's Ferry gauge.¹⁶ The willingness to pay, a standardized economic metric, has been found to be 200% higher when Grand Canyon flows at the Lees Ferry Gage are 13,000 cfs compared to 5,000 cfs.¹⁷ Additionally, in a study completed by Shelby, et al. (1992), they characterized minimum acceptable flows as 10,000 cfs, optimal flows of 20,000 - 25,000 cfs, and a maximum acceptable flow of 45,000 cfs.¹⁸ The same study determined that the "mean minimum level (cfs) for safety with passengers" is 8,405 cfs¹⁹; and for flows between 1,000 and 5,000 cfs and 5,000 to 9,000 cfs over 85% and over 50%, respectively, of all survey respondents thought accidents were more likely to happen.²⁰ Considering this information, the DEIS incorrectly summarizes the results of past recreation flow preference studies. Page 3-154 of the DEIS states that flows below 10,000 cfs are categorized as "less than optimum". The results of Shelby, et al. (1992) are very clear that flows below 10,000 cfs are not just less than optimum, they are "unsatisfactory". Flows between 10,000 cfs and 20,000 cfs are less than optimum, but satisfactory. The language in the DEIS should be adjusted to accurately portray these published findings.

Considering the worsening hydrologic future in the basin and the amount of water cuts required to sustain the health of the river, we recognize that it may be impossible to maintain Grand Canyon river flows above the scientifically-determined acceptable flow of 10,000 cfs all year round. For the purposes of the impact analysis, we request that Reclamation use the 10,000 cfs threshold to determine when impacts will begin to occur and what opportunities exist to directly mitigate those impacts. In addition, *and only in addition*, to assessing impacts for flows below 10,000 cfs, lower thresholds can be used to assess further impacts to resources. Less than 8,000 cfs has been determined through past studies and comments from

¹⁶ <https://waterdata.usgs.gov/monitoring-location/USGS-09380000/>

¹⁷ Christopher Neher, Lucas Bair, John Duffield, David Patterson & Katherine Neher (2019) Convergent validity between willingness to pay elicitation methods: an application to Grand Canyon whitewater boaters, *Journal of Environmental Planning and Management*, 62(4), 611-625, DOI: 10.1080/09640568.2018.1435411

¹⁸ Shelby, B., Brown, T., Baumgartner, R. (1992) Effects of Streamflows on River Trips on the Colorado River in Grand Canyon, Arizona. *Rivers*, 3(3), 191-201.

¹⁹ *Ibid.*, 196

²⁰ *Ibid.*, 197

Grand Canyon River Guides to have detrimental impacts to motorized craft during the April 1 to September 15 motorized season. There is no literature that supports ‘acceptable’ flows for boating that are lower than 10,000 cfs. However, as described above, river users believe that flows between 1,000 and 5,000 cfs are much more likely to provide unsafe conditions compared to flows ranging from 5,000 to 10,000 cfs; while both flow ranges have been identified to still be unacceptable.²¹ Based on the available data, there is a clear, demonstrated need to conduct a more detailed impact analysis that takes multiple flow thresholds into account.

In addition to expanding the EIS analysis using existing, peer-reviewed data, there is a need to collect additional data on recreational flow preferences for river users in the Grand Canyon. While recent studies have characterized the willingness to pay and other economic factors of flow-related recreation²², the most recent findings on acceptable and optimal flow ranges were published over 30 years ago.²³ With declining hydrology in the basin, recent years have presented much lower flows in the Grand Canyon compared to 30 to 40 years ago. Facing the future reality of continued lower releases from Glen Canyon Dam and considering that user groups may have more experience with lower flows, additional research focused on minimum navigable and low acceptable flow ranges will be useful for implementing Post-2026 Operations and better understanding the market and non-market impacts to river recreation downstream of Glen Canyon Dam. Reclamation should work with the Grand Canyon Monitoring and Research Center, American Whitewater, and other experts to conduct future flow-dependent research.

Recommendation

1. The language in the DEIS should be adjusted to accurately portray the peer-reviewed, published research on acceptable and optimal flows.
2. The DEIS should be updated and expanded to include a full analysis of multiple flow thresholds for recreation, including the impact of flows in the Grand Canyon below 10,000 cfs.
3. Reclamation should work with appropriate partners to conduct additional river recreation flow preference data.

Relevance of Diurnal Releases on Recreation Resources:

²¹ Ibid., 194; 197

²² Christopher Neher, Lucas Bair, John Duffield, David Patterson & Katherine Neher (2019) Convergent validity between willingness to pay elicitation methods: an application to Grand Canyon whitewater boaters, *Journal of Environmental Planning and Management*, 62(4), 611-625, DOI: 10.1080/09640568.2018.1435411

²³ Shelby, B., Brown, T., Baumgartner, R. (1992) Effects of Streamflows on River Trips on the Colorado River in Grand Canyon, Arizona. *Rivers*, 3(3), 191-201;

Throughout the DEIS, Reclamation references the relevance of “daytime flows” and their importance for river recreation. Daytime flows are referenced as a key aspect of the methods used to assess whitewater boating.²⁴ Additionally, meeting flow thresholds specifically during the daytime appears to be used as a metric to compare impacts across alternatives.²⁵ This is very problematic because the concept of daytime (versus nighttime) releases from Glen Canyon Dam serves very little relevance for whitewater boating in the Grand Canyon. Non-motorized whitewater boating trips most commonly range from 14 to 19 days, meaning the timing of releases from Glen Canyon do not coincide with the same time of day as you travel downstream. A typical non-motorized trip therefore might experience the low end of the diurnal flow range after the fifth day of their trip, potentially cycling through 3 completely different diurnal flow regimes in one full length trip. Additionally, since new groups launch from Lee’s Ferry every day it is factually impossible to ensure that groups on the river benefit from the hydro peaking flows that occur during the day at Glen Canyon.

The reference to daytime hydro peaking flows as a component of recreational flow thresholds should be removed from the DEIS and from modeling scenarios. The inclusion of the daytime flow threshold begs the question of how Reclamation incorporated diurnal fluctuations into the modeling scenarios to determine how often releases below 8,000 and 5,000 cfs would occur *during the day* from Glen Canyon. Particularly since the DEIS is clear that the CRSS modeling is limited to a monthly timescale.²⁶ We have been unable to locate any described methodology for how Reclamation was able to determine performance against ‘daily’ minimum thresholds by using modeling based on release volumes per month. Furthermore, while the DEIS quantifies how often daily flows drop below 5,000 cfs, it fails to include what the nighttime minimum flows will be and it fails to include mention of the assumptions that must have been made to get from monthly release volumes to daily flow minimums, including ramping rates and the full diurnal release range.

The concept of hydro peaking (higher flows during the day) should be reimagined entirely. Hydropower is an authorized use at Glen Canyon, however under the Colorado River Compact and the Colorado River Storage Project Act it is explicitly subservient to domestic and agricultural uses.²⁷ The CRSP Act went so far as to define hydropower as an *incidental use*. Congress further directed in the Grand Canyon Protection Act of 1992 that Glen Canyon Dam be operated to protect and improve the values of Grand Canyon National Park and Glen Canyon

²⁴ U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Vol. I, ch. 3, at 3-155 (2026).

²⁵ U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Vol. I, ch. 3, at 3-182 (2026).

²⁶ U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Vol. III, TA-3, at 3-19 (2026).

²⁷ Colorado River Compact, Pub. L. No. 67-186, 45 Stat. 1057 (1928); Colorado River Storage Project Act, Pub. L. No. 84-485, 70 Stat. 105 (1956).

National Recreation Area, including visitor use.²⁸ Nothing in the aforementioned legal authorizations for Glen Canyon Dam prioritizes hydropower uses above other water uses and values. As water supply continues to decline and monthly and annual releases from Glen Canyon are reduced, it will be increasingly difficult to maintain minimum flows in the Grand Canyon. Removing or severely reducing hydro peaking will allow minimum flows to be increased. For example, rather than fluctuating between 5,000 cfs and 8,000 cfs in a 24-hour period, flows could be maintained at a constant 6,000 cfs. The DEIS treats hydropower primarily as (1) an authorized project output and (2) a low-reservoir infrastructure constraint. It does not identify hydropower as a governing legal priority that can override Compact compliance or GCPA's downstream protection mandate. Please refer to the *Dams and Electrical Power Resources* section for more comments on the need to deprioritize hydropower.

Recommendation

1. Modeling analysis should be adjusted to assess how often releases drop below 10,000, 8,000, and 5,000 cfs regardless of the time of day and a more complete methodology should be published to explain how Reclamation modeled the daily flow results.
2. The DEIS should clearly demonstrate that hydropower is subservient to water delivery and to protecting ecological, cultural, and recreational resources in the Grand Canyon.

River Recreation Infrastructure:

The DEIS addresses impacts to reservoir recreation due to changing reservoir elevations, including boating access at Lake Powell and Lake Mead.²⁹ However, the analysis fails to adequately address impacts to river recreation infrastructure located within the geographic scope of the DEIS, including critical take-out facilities that are directly affected by declining reservoir levels. For example, North Wash, the primary takeout for Cataract Canyon river trips and located within Lake Powell, has faced severe impacts due to dropping reservoir levels.³⁰ As reservoir levels decline, the site has experienced severe operational impacts, including loss of access, extended motorized haul distances, safety hazards, and increased logistical and financial burdens for commercial outfitters and private boaters. These impacts are a foreseeable consequence of reservoir operations evaluated in this DEIS.

Under the National Environmental Policy Act (NEPA), agencies must not only disclose environmental impacts but also identify and evaluate reasonable mitigation measures.³¹ Where operational alternatives predict ongoing or increased impacts to recreation access within the

²⁸ Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, Title XVIII, 106 Stat. 4600 (1992)

²⁹ U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Vol. I, ch. 3, at 3-157 (2026).

³⁰ <https://drive.google.com/file/d/1GjXkcsGT3pZcldT1UenOFw0rNOKCdaZx/view>

³¹ 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1502.14(f), 1502.16(a)(9)

project area, the DEIS must evaluate mitigation strategies that are specific, feasible, and commensurate with the scale of impact.

Recommendation

1. Reclamation must also analyze impacts to river recreation infrastructure in the geographic scope, not just reservoir recreation. It should be identified that river recreation infrastructure impacted by reservoir levels needs to be mitigated.

Socioeconomics

The DEIS states that the Enhanced Coordination and Maximum Operational Flexibility alternatives perform best for non-market values.³² However, TA-14 indicates that these alternatives maintain river flows above 5,000 cfs and 8,000 cfs in fewer modeled scenarios than other alternatives. If river recreation is properly incorporated into the non-market valuation framework, this result should materially affect the comparative outcome. The apparent inconsistency suggests that either (1) river recreation is underweighted in the non-market aggregation, or (2) the conclusion is driven primarily by reservoir boating access rather than river recreation performance. The DEIS does not disclose how these different recreation categories are weighted or monetized in the non-market comparison. Absent such disclosure, the conclusion that Enhanced Coordination and Maximum Operational Flexibility alternatives “perform best” for non-market values lacks analytical support with respect to river recreation and should be revised.

Recommendation

1. The socioeconomics section should be revised to include a more comprehensive analysis of the market and non-market river recreation values and revise the alternatives comparison to reflect the updated analysis.

Sediment

Operating Glen Canyon Dam to support more natural riverine processes in the Grand Canyon, including the use of High Flow Experiments (HFEs), is essential to sustaining recreational and ecological values downstream. Congress directed the Secretary, through the Grand Canyon Protection Act (GCPA), to operate Glen Canyon Dam “... to protect, mitigate adverse impacts to, and improve the values” of Grand Canyon National Park.³³ Maintenance of sandbars, riparian vegetation, and accessible campsites is central to that mandate.

³²U.S. Bureau of Reclamation, *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead: Draft Environmental Impact Statement*, Vol. I, ch. 3, at 3-181 (2026).

³³ Pub. L. No. 102-575, § 1802(a), 106 Stat. 4600, 4669 (1992)

Since the construction of Glen Canyon Dam, sediment has been trapped from moving downstream into Grand Canyon National Park. The only viable mechanism for distributing sediment downstream involves a complex calculation of sand inputs from the Paria River and the Little Colorado River combined with available water for generating high flow releases from Glen Canyon to transport and deliver sand throughout the Grand Canyon. The Department of the Interior's Long-Term Experimental and Management Plan (LTEMP) identifies HFEs as the primary tool for rebuilding sandbars that support both ecological function and multi-day river recreation. However, DEIS modeling indicates that reservoir elevations frequently approach levels that constrain or preclude HFEs, even under the better-performing alternatives.

Recommendation

1. The DEIS directly shows that declining reservoir levels and reduced water storage will decrease the feasibility and occurrence of HFEs, which will jeopardize the ecological and recreational resources in the Grand Canyon. Rather than just identifying how often HFEs may occur under each alternative, the DEIS must address alternative solutions for sediment transport and sandbar development. Additionally, Reclamation should make it clear in the FEIS and ROD that regardless of the chosen alternative, HFEs should be conducted when the conditions allow.
2. Reclamation must clearly state that continued research on HFEs and potentially similar programs is a priority.
3. Long-term solutions for sandbar development should additionally be explored, for example, it is critical that Glen Canyon Dam infrastructure be updated to safely pass sediment through as reservoir levels decline. See the *Dams and Electrical Power Resources* section for more detail on infrastructure needs.

Tribal Resources

American Whitewater supports the fulfillment of Tribal water rights and encourages Reclamation to more directly and meaningfully include Basin Tribes in intrabasin negotiations regarding post-2026 operational guidelines. Tribal Nations possess federally reserved water rights and sovereign authority that must be treated as foundational components of Colorado River management, not ancillary considerations. See *Arizona v. California*, 373 U.S. 546 (1963) that recognized reserved water rights for several Basin Tribes.

American Whitewater supports Tribal sovereignty in the Colorado River Basin and supports elements of alternatives that meaningfully address Tribal water supply, cultural, ecological, and economic needs. The DEIS socioeconomic analysis does not adequately incorporate non-market or market values associated with Tribal cultural resources, Traditional Cultural Properties (TCPs),

subsistence uses, spiritual values, and cultural continuity. NEPA requires agencies to evaluate both market and non-market environmental consequences using high-quality information and accurate scientific analysis.³⁴ Although much of the Tribal data must remain confidential and quantitative analysis may not be possible in some cases, the DEIS fails to communicate the magnitude of the socioeconomic effects that basin Tribes and indigenous peoples will experience if the health of the river is diminished. The current analysis does not transparently assess how changes in reservoir elevations and river operations will affect Tribal non-market values across alternatives, nor does it distinguish between economic impacts to Tribes and broader regional economic indicators. The socioeconomic analysis should therefore be revised to.

The DEIS also acknowledges that fluctuating reservoir elevations and river stages may damage sensitive Tribal resources, including Traditional Cultural Properties. In particular, diurnal fluctuations associated with hydropeaking operations at Glen Canyon Dam cause repeated and rapid stage changes in the Grand Canyon corridor. These fluctuations increase shoreline erosion, destabilize archaeological and cultural sites, and exacerbate impacts to TCPs located along riverbanks and reservoir margins. Continued hydropeaking operations that contribute to documented cultural resource degradation are inconsistent with the mandate of the 1992 Grand Canyon Protection Act.³⁵

For these reasons, and the additional concerns identified throughout this letter, hydropeaking operations at Glen Canyon Dam should be reevaluated and discontinued in favor of more stable flow regimes that reduce erosion, protect cultural sites, and support resource protection.

Recommendation

1. Treat Tribal reserved water rights and sovereign interests as foundational planning constraints and clearly integrate them into post-2026 operational decision-making.
2. Expand analysis of both market and non-market impacts to Tribal communities, including effects on Traditional Cultural Properties (TCPs), cultural continuity, subsistence uses, and spiritual values, and distinguish Tribal-specific impacts from broader regional indicators.
3. Assess elimination or substantial reduction of hydropeaking operations at Glen Canyon Dam to reduce erosion, stabilize cultural sites, and ensure compliance with the Grand Canyon Protection Act's mandate to protect downstream values.

³⁴ 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1502.16(a), 1502.24.

³⁵ Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, Title XVIII, 106 Stat. 4600 (1992)

Dams and Electrical Power Resources

The DEIS evaluates vulnerability to Lake Powell falling below elevation 3,500 feet under Average, Dry, and Critically Dry hydrology.³⁶ It does not, however, quantify the expected duration of operation below 3,490 feet under each alternative, nor does it assess how long releases would rely exclusively on the ROW.

Under several alternatives, including No Action, Basic Coordination, and Supply Driven, Lake Powell is vulnerable to falling below the 3,500-foot buffer under flow conditions that have occurred repeatedly in the historical record.³⁷ Enhanced Coordination and Maximum Operational Flexibility provide greater protection but are not immune under critically dry futures.³⁸

The DEIS focuses on whether critical elevations are reached, not how long operations persist below those elevations. Without a duration analysis, the operational burden on the ROW cannot be evaluated. If the reservoir falls below 3,490 feet for extended periods, the ROW becomes the only available release pathway, and its reliability becomes the controlling factor in downstream water delivery.

The March 26, 2024 Technical Decision Memorandum establishes interim operating guidance specifically because of concerns associated with long-term low-elevation operation. The memorandum states that Reclamation has limited experience operating the facility under these conditions and that investigations and modeling are ongoing.³⁹

The memorandum makes clear that the ROW was not designed for sustained low-head operation. It states there is “nothing to indicate the river outlet works were intended for long-term water conveyance use at low reservoir water levels.”²² The document further notes that the official reservoir stilling well terminates near the penstock elevation, indicating that reservoir elevations below minimum power pool were not anticipated.²²

Cavitation risk increases at low reservoir elevations because static pressure declines while conduit velocities remain high. The memorandum documents historical coating damage and pipe wall pitting during low-elevation operations and warns that continued operation under such conditions may result in progressive damage to the steel conduit if allowed to continue for

³⁶ Bureau of Reclamation, *Draft Environmental Impact Statement, Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead*, Executive Summary, Section ES.4, pp. ES-23–ES-28.

³⁷ *Ibid*

³⁸ *Ibid*

³⁹ Bureau of Reclamation, *Establishment of Interim Operating Guidance for Glen Canyon Dam during Low Reservoir Levels at Lake Powell*, Technical Decision Memorandum, March 26, 2024, pp. 1–2, 5–9.

long durations.⁴⁰ To reduce this risk, interim maximum flow limits below design capacity have been imposed.

The memorandum also raises concern regarding the hollow-jet valves. While found to be functional during recent inspection, they are aging components dating to the early 1960s. The memorandum states that there is concern with using the outlet works to provide long-term releases, particularly at high flows, and notes that major overhaul or replacement would be necessary to achieve high confidence in continuous operation.⁴¹

Sediment redistribution in the tailrace presents additional risk. The memorandum references historical low-elevation outlet operations in 1965 that led to scour and structural failure of the tailrace slab.⁴² It warns that operating the outlet works without concurrent penstock discharges will redistribute sediment and may impound draft tubes, with unknown removal time and methods if bulkheads are installed.

The memorandum concludes that it is recommended that Reclamation not rely on the ROW as the sole means for releasing water below minimum power pool.²² The DEIS does not integrate this risk into its alternatives evaluation.

Below elevation 3,490 feet, the penstocks cannot operate and the spillways are unavailable. The ROW becomes the sole mechanism for downstream releases.

If one or more conduits were impaired due to cavitation damage, valve malfunction, gate failure, trashrack blockage, or structural concerns, discharge capacity would decline immediately. If multiple conduits were compromised, or if interim operational limits prevented meeting required release volumes, Glen Canyon Dam could be unable to pass required deliveries.

The consequences extend beyond the dam structure. Inflows to Lake Mead would be interrupted, destabilizing Lower Basin storage and affecting water supplies serving approximately 40 million people in Arizona, Nevada, California, and Mexico. Variable and minimum base flows through the Grand Canyon are essential for ecological stability and the recreation economy. A significant interruption would strand aquatic species, disrupt sediment dynamics, halt river recreation trips, and undermine decades of management efforts. The DEIS does not evaluate this failure scenario.

⁴⁰ *Ibid*

⁴¹ *Ibid*

⁴² *Ibid*

The DEIS must treat long-term low-elevation release reliability as a core system objective. Structural alternatives should be evaluated not primarily as hydropower modifications but as water delivery and sediment management infrastructure.

The Low-Head Hydropower Modifications presentation identifies conceptual alternatives that could substantially expand discharge capacity below 3,490 feet.⁴³ For example, certain abutment powerplant concepts nearly double maximum discharge below minimum power pool compared to the existing configuration.⁴⁴ Increased discharge capacity provides critical redundancy and operational flexibility.

Sediment management must be treated as a co-equal design objective. The presentation documents intake elevations relative to assumed silt levels and current forebay conditions.⁴⁵ Any new low-level intake or abutment tunnel must be capable of mobilizing and transporting sediment during high flow events to maintain long-term reservoir functionality.

Recommendation

1. Hydropower generation should not drive structural design if it compromises water conveyance reliability. Several retrofit alternatives require dam penetrations, deep excavation, new guard gates, and installation of low-head runners.⁴⁶ The DEIS must evaluate whether the capital and lifecycle costs of such modifications exceed the cost of replacement renewable energy resources.

Conclusion

American Whitewater members, and our broader community of supporters and partners, care deeply for the Colorado River and its remarkable canyon landscapes. Our community possesses intimate, place-based knowledge of the river corridors throughout the Basin. We rely on healthy, functioning rivers in the basin not only for economic stability and outdoor recreation, but also for cultural connection, physical well-being, and personal identity.

American Whitewater recognizes that under existing Glen Canyon Dam infrastructure and current hydrologic trends, sustaining minimum acceptable flows in the Grand Canyon presents increasing operational challenges. Recreation, like many other Basin resources and user groups, will experience reduced water availability and direct negative impacts under declining storage

⁴³ Bureau of Reclamation, *Glen Canyon Dam Low-Head Hydropower Modifications, Alternatives Presentation*, slides 4, 11–16, 21–23.

⁴⁴ *Ibid*

⁴⁵ *Ibid*

⁴⁶ *Ibid*

scenarios. These impacts must be fully disclosed, accurately analyzed using the best available scientific information, and mitigated to the greatest extent practicable.

It is critical that the Final EIS employs rigorous and transparent analyses of recreational, ecological, cultural, and socioeconomic impacts. Long-term operational and infrastructure strategies must be developed to preserve the Colorado River as a thriving, living ecosystem capable of supporting diverse uses across generations.

Hydropower production, while authorized as an incident of project purposes, should not dictate operational decisions in a manner that degrades natural riverine processes, cultural resources, or recreational values. As Congress has made clear through the Grand Canyon Protection Act, Glen Canyon Dam must be operated to protect and improve the values of Grand Canyon National Park and Glen Canyon National Recreation Area, including visitor use and cultural resources. Operational decisions should reflect that mandate.

American Whitewater's original members experienced the Grand Canyon and other canyons in the Basin before modern dams were constructed. To this day, our members advocate for and highly value naturally functioning river systems. For this reason, our comments are guided by the question: Will Post-2026 Operations lead to significantly worse river conditions than if Colorado River dams never existed? The inability to pass adequate flows through Glen Canyon Dam is an unacceptable outcome. The loss of naturally functioning ecosystems endemic to the Colorado River Basin is unacceptable. The loss of world-renowned recreational opportunities is unacceptable. Reclamation, water users, and the people of the United States must come together to find solutions that ensure the Colorado River remains a functioning, living river.

We respectfully request that our comments be reviewed and considered in full prior to development of the Final EIS. Further, we request a meeting with Reclamation staff to discuss these comments and to continue constructive engagement on post-2026 operational guidelines.

American Whitewater remains committed to working collaboratively to ensure that Colorado River management reflects scientific integrity, statutory mandates, and the long-term protection of the Basin's natural and recreational resources.

Sincerely,

Kestrel Kunz
Southern Rockies Protection Director
American Whitewater
kestrel@americanwhitewater.org

Hattie Johnson
Southern Rockies Restoration Director
American Whitewater
hattie@americanwhitewater.org

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