



— BUREAU OF —  
RECLAMATION

**Peer Review Plan for:**  
***Technical Memorandum on the  
Implementation and Impact of Revised  
Evaporation Coefficients for Lake Powell,  
2023***

**Upper Colorado Basin Region**

## Subject and Purpose

Reclamation's Upper Colorado Basin Region funded Reclamation's Technical Services Center (TSC) to conduct a monitoring program to update and improve the accuracy of reservoir evaporation rate estimates for Lake Powell. The study implemented two independent evaporation monitoring methods, eddy covariance and aerodynamic mass transfer, to provide updated reservoir evaporation estimates using the best available science. The TSC published a technical memorandum documenting the methods and analysis for data collected between 2018 and 2021 at Lake Powell (Reclamation, 2022).

Results from the TSC monitoring program were used to produce new monthly evaporation coefficients for Lake Powell to be used in the Upper Colorado Basin's reservoir operations models. These new coefficients will replace those currently used in the operations models, which were determined from a study performed by Reclamation's Upper Colorado Basin Region in 1986 (Reclamation, 1986).

The Upper Colorado Basin Region's Projects, Operations, and Modeling Division (POMD) will implement the revised coefficients for mid-term operations and long-term planning models based on the RiverWare platform. These models include the Colorado River Mid-term Modeling System (CRMMS) 24-Month Study (24MS), the CRMMS Ensemble Streamflow Prediction (ESP) model, the Natural Flow and Salt model, and the Colorado River Simulation System (CRSS). The 24MS modeling results determine annual operating conditions and operating tiers at Lake Powell (in the Upper Colorado Basin Region) and Lake Mead (in the Lower Colorado Basin Region), in accordance with the 2007 Interim Guidelines (Guidelines) for the Coordinated Operations of Lake Powell and Lake Mead. The use of revised reservoir evaporation coefficients has the potential to shift operating decisions at the two largest reservoirs in the Colorado River Basin when projected elevations are close to the thresholds shown in the Guidelines.

Due to the potential impact to decision making, POMD will publish a new technical memorandum which contains a sensitivity analysis that analyzes the implementation and impact of the new evaporation coefficients in Reclamation models. Two groups within POMD, the River Operation's Group and the Research and Modeling Group, will complete the sensitivity analysis.

The sensitivity analysis developed by POMD, for which this Peer Review Plan has been developed, will help study the impact to deterministic and probabilistic models due to the revised coefficients. The analysis will also better inform Reclamation leadership and stakeholders on what changes (if any) could happen.

After consulting with Reclamation's Peer-Review Council, it was determined that a Reclamation Technical Memorandum, peer-reviewed by Reclamation staff, would be sufficient to justify the implementation of new evaporation coefficients.

## Project Team

The technical memorandum was prepared by the Upper Colorado Basin Region's Operations Office – River Operations Group and Research and Modeling Group.

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## Impact of Dissemination

Based on the definition of scientific information in CMP-P14, the category that best describes the batch work/studies being reviewed is marked below.

HISA: \_\_\_\_\_ ISI:  X  Discretionary: \_\_\_\_\_

This PRP is being submitted for the review of influential scientific information (ISI).

Under Reclamation policy CMP P14, Peer Review of Scientific Information and Assessments, in fulfillment of the Final Information Quality Bulletin for Peer Review (70 FR 2664-2677) and implementation of the Information Quality Act (Pub. L. 106-554), the science informing the proposed Technical Memorandum is determined to contain influential scientific information. This status was determined since updating model coefficients can have an impact on 24MS determinations as stated in the Guidelines, as well as operational decisions under the Upper and Lower Basin Drought Contingency Plan Agreements.

## Peer Review Scope

Reviewers will consider the implementation of revised monthly evaporation coefficients in the operations and planning models, CRMMS and CRSS, respectively. Reviewers will also consider the sensitivity analysis results and whether any further analysis needs to be performed. The following questions should be considered by reviewers:

1. Did the sensitivity analysis performed by POMD thoroughly evaluate the impact of revised monthly reservoir evaporation coefficients on CRMMS and CRSS model projections and CRMMS-24MS annual determinations?
2. Are the conclusions presented in the sensitivity analysis reasonable and valid, given the analyses and results provided in the report?

Reviewers are to provide comment solely on the scientific information being reviewed, and not on any agency decision or policy.

## Peer Review Schedule

Reclamation peer reviewers will be asked to complete their reviews within three weeks. The study leads will proceed with the peer review of the technical memo once the Upper Colorado Basin Region’s Regional Director’s office has been fully briefed on the findings of the study.

Both this Peer Review Plan and the final Peer Reviewed Report will be posted on Reclamation’s Peer Review webpage and on the Reclamation Information Sharing Environment (RISE).

## Review Methodology

The Peer Review methodology for this Peer Review Plan will be performed as indicated below with an “X”.

The peer review will be conducted by:	Individuals: <b>X</b>	Panel:	Combo:
The identities of the reviewers will be disclosed in accordance with the Privacy Act:	Yes: <b>X</b>	No:	
Individual comments will be attributed to individual reviewers:	Yes: <b>X</b>	No:	
Comments from reviewers will be summarized together:	Yes: <b>X</b>	No:	
Significant/relevant public comments will be provided to the reviewers prior to the review:	Yes:	No: <b>X</b>	
There will be opportunities for the public to participate in the Peer Review process as applicable.	Yes:	No: <b>X</b>	

The public will not be involved with the review of the technical memorandum; therefore, there will be no public comments to provide the peer reviewers. The results from the technical memorandum will be rolled out to Colorado River Basin stakeholders following the completion of the peer review process.

## Peer Reviewer Selection

The selections below apply for the selection of reviewers for this Peer Review Plan. Additional information is provided in the space provided as applicable.

Will Peer Reviewers be selected by Reclamation?	Yes: <b>X</b>	No:
Will Peer Reviewers be selected by an outside organization?	Yes:	No: <b>X</b>
Will the Public be asked to nominate reviewers?	Yes:	No: <b>X</b>
How many reviewers will be used?	<b>3 Reviewers</b>	

The reviewers should possess the following disciplines or expertise:

Peer reviewers will have had at least 3-years of experience with expertise in hydrology, natural sciences, engineering, or water/reservoir management. The reviewers will be selected by Reclamation from outside of the Upper Colorado Operations Office. Reviewers should have a general knowledge regarding Colorado River Basin operations guidelines. The public will not

be asked to participate in the reviewer selection process.

## Delivery of Findings

The peer review lead will provide a review template to be used by each reviewer. Each peer reviewer will submit a report of their findings to the Peer Review Lead by the end of the review period, including their answers to the review questions listed above under Peer Review Scope. Attached to the review report will be a copy of the technical memorandum that includes comments, findings and recommendations in track changes or comments from the reviewer. The final review reports will be returned digitally to the Peer Review Lead by individual reviewers.

## Peer Review Response

The Peer Review Lead will compile all comments received from the reviewers into a final Peer Review Report, which will be posted to Reclamation's peer [review website](#). The Peer Review Report will summarize the findings of the peer reviews and list the comments provided by the reviewers, as well as Reclamation's response to the comments, actions the agency will undertake regarding the comments, and reasons the agency believes those actions will satisfy any key concerns or recommendations.

## Additional Information

### Federal Register Notice

The selected statement below applies to this study. Additional information is provided below as applicable.

	Federal Register notices <b>will</b> be provided announcing the formation of a peer review team and completion of the final report.
X	Federal Register notices <b>will not</b> be provided announcing the formation of a peer review team and completion of the final report.

### Applicability of the Federal Advisory Committee Act

The selected statement below applies to this study. Additional information is provided below as applicable.

X	This peer review <b>is not</b> subject to the Federal Advisory Committee Act (FACA) because the review does <b>not</b> involve open meetings or committee chartering and reviewers are being asked to provide individual reviews on the subject matter. Reclamation is <b>not</b> seeking consensus advice from the reviewers as a group.
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This peer review **is** subject to the Federal Advisory Committee Act (FACA) because the review involves open meetings or committee chartering and reviewers are being asked to provide individual reviews on the subject matter. Reclamation is seeking consensus advice from the reviewers as a group.

## References

Bureau of Reclamation (Reclamation, 1986). Lake Powell Evaporation. Bureau of Reclamation Upper Colorado Regional Office.

Bureau of Reclamation (Reclamation, 2022). Evaporation from Lake Powell: In-situ Monitoring between 2018 and 2021. Bureau of Reclamation Technical Memorandum No. ENV-2023-007.