

In planning for Sites Reservoir, the Sites Project Authority analyzed potential impacts to water quality in the Sacramento River and the Sacramento-San Joaquin Delta (Delta) ecosystem as part of our continued commitment to water quality monitoring and protection. The Authority addressed questions and comments raised during public review to ensure that water quality impacts are minimized as much as possible during Project operations. The revised Project modeling includes a deeper dive into how Project operations will impact key water quality factors.

Key Facts & Information

- Potential impacts to water quality were analyzed using a conservative approach to account for uncertainty when establishing a new reservoir.
- Modeling in the Final EIR/EIS was expanded upon and is now more transparent and easily understandable for the public.
- The Authority has developed a plan for monitoring and mitigating potential water quality impacts, including changing operations of Sites Reservoir, if necessary.

A Conservative Approach Leading to Overestimating Impacts

In analyzing the potential water quality impacts of Sites Reservoir, the Authority took a conservative approach to cautiously navigate the unknowns of assessing effects of a yet-to-be built major reservoir. This means estimated impacts, contained within the Project's environmental documents, are greater than what might occur during reservoir operations. This conservative approach was necessary due to the uncertainty that comes with establishing and modeling a new reservoir. Examples of the conservative analysis include:

- Intentionally underestimating the settling rates of metals within the reservoir, resulting in higher estimated metal concentrations in reservoir and release water than might occur during Project operations
- Assuming no settling of suspended sediment in the conveyance system that delivers water to Sites Reservoir and thus, no reduction in concentrations from the diversion point on the river to the reservoir (Figure 1)
- Focusing on the more conservative/ stringent standards for each water quality constituent analyzed when multiple standards exist

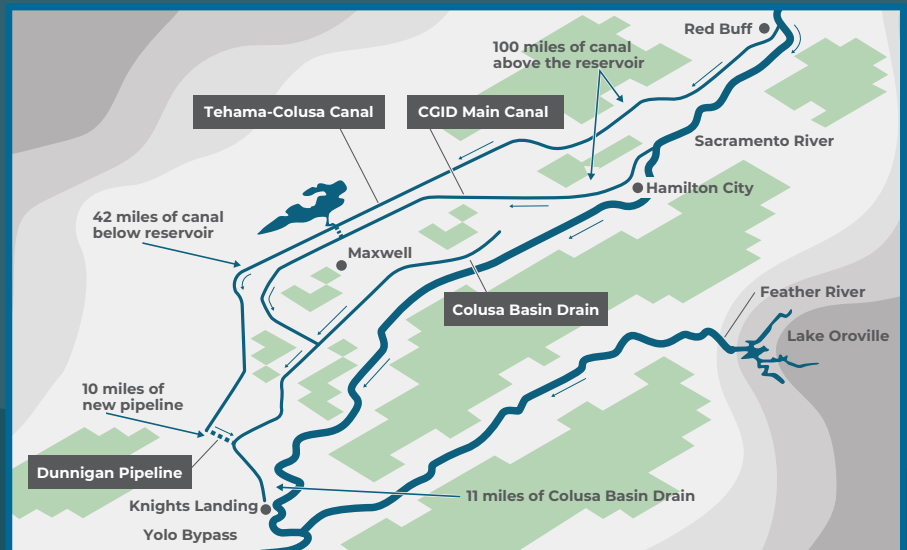


Figure 1. Sites Reservoir would not discharge water directly into the Sacramento River. Instead, it would use both new and existing conveyance systems—more than 150 miles of pipelines and canals—to move water into and out of the reservoir, with ultimate release back to the Sacramento River system at Knights Landing.

Improved Modeling of Discharge Effects

The Authority expanded the analysis of potential effects to water quality in the Final EIR/EIS to better assess the impacts and operations of the Project. The models now include additional data from Sacramento River winter flows and more detailed in-reservoir and release analyses. Efforts were also made to make the modeling process more transparent and easily understandable, such as expanding upon the Harmful Algal Bloom (HABs) analysis and discharge temperature assessment.

Below are some of the important findings from the Final EIR/EIS water quality modeling.

Reservoir and River Release Water

- Estimated discharge concentrations of non-mercury metals to the Sacramento River is expected to be lower than chronic standards for aquatic life protection
- Project operation could cause elevated concentrations of some metals in Stone Corral Creek and mitigation would be implemented to prevent associated impacts
- Water temperatures in the Sacramento River are usually higher than the water temperature of the water released from Sites Reservoir (Table 1). Releases from Sites Reservoir may slightly reduce localized temperatures in Sacramento River during releases and releases would not affect riverine fish such as salmon.

Table 1. Estimated change in Sacramento River water temperature (°F) after Sites Reservoir water is released, discharged to, and mixed with the Sacramento River.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Months ¹	0	0	0	13	15	44	45	67	66	58	25	12
10th Percentile	--	--	--	-0.4	-0.5	-0.2	-0.2	-0.3	-0.1	-0.4	-0.5	-0.1
Median	--	--	--	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	-0.2	-0.1
90th Percential	--	--	--	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0

¹ Number of months when Sites Reservoir releases to the Dunnigan Pipeline would occur during the 83-year CALSIM simulation

Colusa Basin Drain (CBD) Water

- Levels of nutrients, organic carbon, and dissolved oxygen in Sites Reservoir releases would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the CBD
- Sites Reservoir releases could potentially dilute and thus, reduce, the nutrient concentrations in the CBD because of the expected volume and timing of the releases
- The Project is unlikely to increase metal concentrations in the CBD because concentrations in the CBD are similar or higher than concentrations expected in Sites Reservoir releases



Mercury and Methylmercury

- Mercury and methylmercury concentrations are expected to be similar to other similar reservoirs
- Total mercury concentration is expected to be well below California Toxics Rule objective for mercury
- Sites Reservoir is expected to have higher mercury methylation in the short term (first 10 years), which could result in fish tissue concentrations in the reservoir and downstream receiving waters to exceed the California sport fish objective.
 - Mitigation would reduce the methylation of mercury in Sites Reservoir but its relative effectiveness on fish tissue levels is uncertain until 10+ years post reservoir fill
- Sites Reservoir is not expected to substantially increase methylmercury concentrations or bioaccumulation in the CBD, and some releases may decrease methylation potential within the CBD

Harmful Algal Bloom (HAB) Occurrences

- HABs currently occur in the Delta and in many lakes and reservoirs throughout the state including those near Sites Reservoir, such as Black Butte and Clear Lake
- Expected nutrient concentrations and summer water temperatures in Sites Reservoir could create conditions conducive to formation and maintenance of HABs
- The Project's Reservoir Management Plan will address HABs formation through implementing state-recommended actions for recreational inland waters from the California CyanoHAB Network

Monitoring and Mitigation Measures

Using the conservative and expanded analysis in the Final EIR/EIS, the Authority evaluated how Sites Reservoir operations would affect water in the reservoir, downstream creeks and canals, the Sacramento River, and Delta ecosystems (Table 2). Using this information, the Authority developed plans for avoidance, minimization, and mitigation of potential significant and/or harmful effects. This includes an extensive program for monitoring and managing of water chemistry and quality, Stone Corral Creek metal concentrations, temperature, and potential changes to pesticide and non-mercury metal concentrations in downstream waters, including in the Yolo Bypass.



Table 2. The Final EIR/EIS considered the following mechanisms by which operations could affect water quality. These mechanisms were evaluated qualitatively and quantitatively by their associated constituents through various established models.

Mechanisms by Which Sites Reservoir Operations Could Affect Water Quality	Main Constituents Considered	Qualitative	Quantitative	Model Results Considered
Temporal Shift	Metals Pesticides Salinity	X	X	CalSim
Evapoconcentration	Metals, Salinity		X	CalSim
In-Reservoir Processes	Mercury, Metals HABs, Nutrients/OC/DO Temperature Salinity	X	X	Reservoir temperature modeling (CE QUAL W2)
Change in Systems Reservoir Operations	Temperature HABs Mercury	X	X	CalSim, HEC5Q, Reclamation temp model, Central Valley TMDL mode
Change in Delta Operations	Salinity Chloride	X	X	CalSim and DSM2 QUAL
Redirection of CBD Flow to Yolo Bypass	Pesticides, Metals Nutrients/OC/DO HABs Mercury Temperature	X	X	CalSim

In addition, the Authority is in the process of developing a Reservoir Management Plan which includes detailed methodology for monitoring and reporting of water quality associated with the Project. Monitoring and reporting of water quality are in place to ensure the proposed water quality avoidance, minimization and mitigation measures are working as intended. If reporting shows the measures are not working, operation of Sites Reservoir will be modified to reduce or eliminate the potential effects to water quality. The Reservoir Management Plan will address concerns and potential affects from HABs, cyanotoxins, methylmercury, other metals, salinity, and water temperature. It also includes specific actions, if needed, to protect the public from exposure to HABs or to fish with high methylmercury concentrations and proposes collaborative adaptive management approaches for responding to water quality concerns in the reservoir and downstream locations.

TO REVIEW THE FINAL EIR/EIS, PLEASE VISIT:
[SITESPROJECT.ORG/ENVIRONMENTAL-REVIEW](https://sitesproject.org/environmental-review)

