



Meeting: **Reservoir Committee & Authority Board**
Agenda Item 3.2

January 19, 2024

Subject: **CalSim 3 Modeling Update**

Requested Action:

Receive an overview of Project operations modeling using the recently developed CalSim model platform (commonly referred to as CalSim 3).

Detailed Description/Background:

The Sites Project has been thoroughly modeled and analyzed in CalSim II, which has been the modelling platform used for decades to simulate California water operations. As a reminder, the CalSim II results from the Sites BA/ITP modeling analysis are included in Attachment A. CalSim 3 was released in 2021 and first used for a full-scale modeling effort in 2022. Reclamation did not release a baseline model that includes a representation of the CVP and SWP operations using CalSim 3 until mid-2023. With this baseline model release and the use of CalSim 3 for the on-going 2023/2024 reconsultation efforts for the CVP and SWP, the water community is now in a state of transition in moving from regular use of CalSim II to developing project modeling representations in CalSim 3.

CalSim 3 has a higher spatial resolution and extent (i.e., more areas where the model will provide output and additional smaller and/or remote systems are simulated in the model). CalSim 3 also has an extended simulation period which runs 100 years from 1921 to 2021, along with a representation of dynamic groundwater-surface water interactions. CalSim 3 also has a different model structure and incorporating the Sites Project into the CalSim 3 model has been a substantial effort. However, transitioning to a CalSim 3 model platform ensures that the Authority can continue to use a modeling platform for Sites that “communicates” with other models that represent other major water infrastructure and operations.

Efforts to date in development of a Sites CalSim 3 model have included incorporation of the Project’s physical infrastructure (e.g., reservoir and pipelines) along with diversion and storage of water. The team is currently finalizing the Project’s water releases including the south-of-Delta member water account operations and Reclamation’s account operations. Daily calculations to implement Sites operations are also being developed and incorporated. Exchanges with Oroville are also being incorporated into the

model. The team will focus on incorporating exchanges with Shasta as the last piece to the model. CDFW has requested CalSim 3 modeling for Sites as part of the ITP for Operations and staff is working to get them modelling results as they are completed. Various runs of the CalSim 3 model are expected to be needed by CDFW and staff is working to run these and provide to CDFW incrementally.

If the Sites Project were just moving from CalSim II to CalSim 3 and no other parameters were changing, the team would expect the results to be very similar as the two models are simulating the same operation, just with more granularity in CalSim 3. However, in this effort, we are also using the new, not yet approved, 2023/2024 CVP/SWP Reconsultation Proposed Action as the baseline. This baseline has different operations for the CVP/SWP, especially for Shasta Reservoir, as compared to the 2019/2020 reconsultation efforts (which is used as the baseline in the Sites CalSim II model). It also includes a representation of some of the water supply assets being developed as part of the Voluntary Agreements.

Model development is continuing, and numeric modeling results are expected to be shared at the March Operations and Engineering Work Group and March Joint Reservoir Committee and Authority Board meeting.

Fiscal Impact/Funding Source:

The development of a Sites CalSim 3 model can be completed within the Amendment 3 Work Plan total budget.

Staff Contact:

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Primary Service Provider:

Jacobs

Attachments:

Attachment A: Summary of CalSim II Results

**Attachment A:
Summary of CalSim II Results**

Below is a summary of the CalSim II modelling results from the Sites BA/ITP modeling analysis. As a reminder, this analysis uses the most up-to-date diversion criteria, including 10,700 cfs bypass flow at Wilkins Slough, a reduced deadpool size to 60 thousand acre-feet, expands exchanges with the Bureau of Reclamation to enhance anadromous fish benefits, and includes a 2035 central tendency climate change hydrology set. This information was presented to the Reservoir Committee and Authority Board at their April 2022 meetings and was slightly revised since that time, but no substantial changes in the numbers have been made (numbers vary by 1,000 to 3,000 acre-feet, depending on parameter since the April 2022 staff report).

Table 1. Modeled Long-term Average Releases from Sites

	Alternative 3A 2035 CT (TAF)	Alternative 3B 2035 CT (TAF)
Wet	103	108
Above Normal	390	318
Below Normal	354	322
Dry	443	451
Critical	288	290
Average	283	271
<p>Alternative 3A = Reclamation at 25% storage allocation; Alternative 3B = Reclamation at 16% storage allocation. CT = Central tendency; a modeling future baseline that considers future climate change conditions based on a 30-years of change assuming a “central tendency” of 2035 (so considers conditions from 2020 to 2050, with 2035 in the middle of this 30-year span).</p>		

Table 2. Modeled Long-term Average Releases from Sites by Participant Type

	Alternative 3A 2035 CT (TAF)	Alternative 3B 2035 CT (TAF)
North of Delta	26	27
South of Delta	109	126
State	60	61
Reclamation	88	58
Average	283	271
<p>Alternative 3A = Reclamation at 25% storage allocation; Alternative 3B = Reclamation at 16% storage allocation.</p> <p>CT = Central tendency; a modeling future baseline that considers future climate change conditions based on a 30-years of change assuming a “central tendency” of 2035 (so considers conditions from 2020 to 2050, with 2035 in the middle of this 30-year span).</p>		