



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

March 22, 2024

Subject: **Preliminary CalSim 3 Modeling Results**

Requested Action:

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

Detailed Description/Background:

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.

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, including most of the Project's diversion criteria. This initial build of the model has resulted in preliminary results of diversions to fill Sites Reservoir. These results are shown in **(Attachment A)**.

As a reminder, 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. With these changes as compared to the CalSim II model, the preliminary results from CalSim 3 indicate a slight reduction in the average volume diverted to Sites Reservoir as summarized in Table 1.

Table 1. Change in Long Term Average Diversion in Preliminary CalSim 3 Results compared to CalSim II Alternative 3

Scenario	Long-Term Average Diversion (TAF)	Relative Change
CalSim II (Alt 3 051722)	277	-
CalSim 3 (Alt 3 v06b)	263	-14 TAF (-5%)

Model development is continuing, and it is anticipated that these preliminary results will change. Staff will provide updates when the model is complete and more results are available. As these results are preliminary, it is not yet appropriate to consider how these may change Project costs. However, it is important to remember that the model is a representation of how Storage Partners may use their individual accounts – a more aggressive use of a Storage Partners’ account will result in a lower unit (per acre-foot) cost while a more conservative use will result in a higher unit cost.

The CalSim 3 model has proven to be a challenging model to work with and the Sites Project CalSim 3 model development and review/quality control may take several more months to complete.

Prior Authority Board Action:

January 2024 - Received an overview of Project operations modeling using the recently developed CalSim model platform (commonly referred to as CalSim 3).

Fiscal Impact/Funding Source:

As identified above, the CalSim 3 model has proven to be a challenging model to work with. The Sites team has expanded beyond Jacobs/CH2M to include Stantec to help complete this effort. MBK is also involved in quality review of the model. Reclamation and DWR are also providing resources for coding challenges and quality review. The Sites Project CalSim 3 model development and review/quality control may take a few more months to complete and fully quality control/quality review. Staff is currently assessing funding needs to complete this effort and expects that additional funds will be needed for Jacobs and MBKs efforts. However, staff is working to find those funds within the currently allocated Amendment 3 Work Plan permitting budget.

Staff Contact:

Ali Forsythe / Angela Bezzone

Primary Service Provider:

Jacobs

Attachments:

Attachment A: Figure 1 & 2- Preliminary results of diversions to fill Sites Reservoir

Attachment B: Summary of CalSim II results from the Sites BA/ITP modeling analysis

Attachment A

Preliminary results of diversions to fill Sites Reservoir

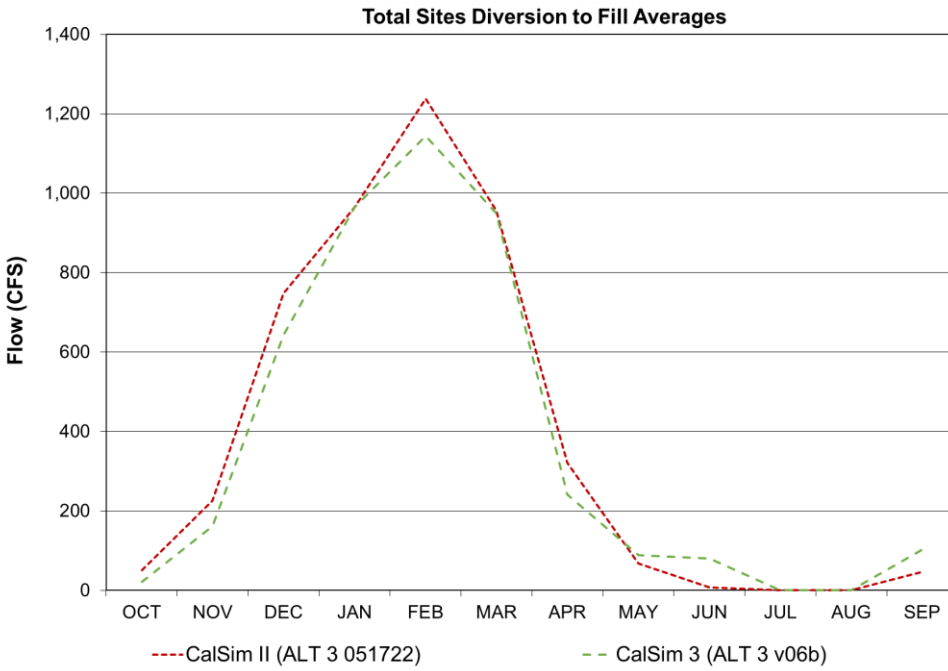


Figure 1. Preliminary CalSim 3 Results - Long Term Average Diversion compared to CalSim II Alternative 3

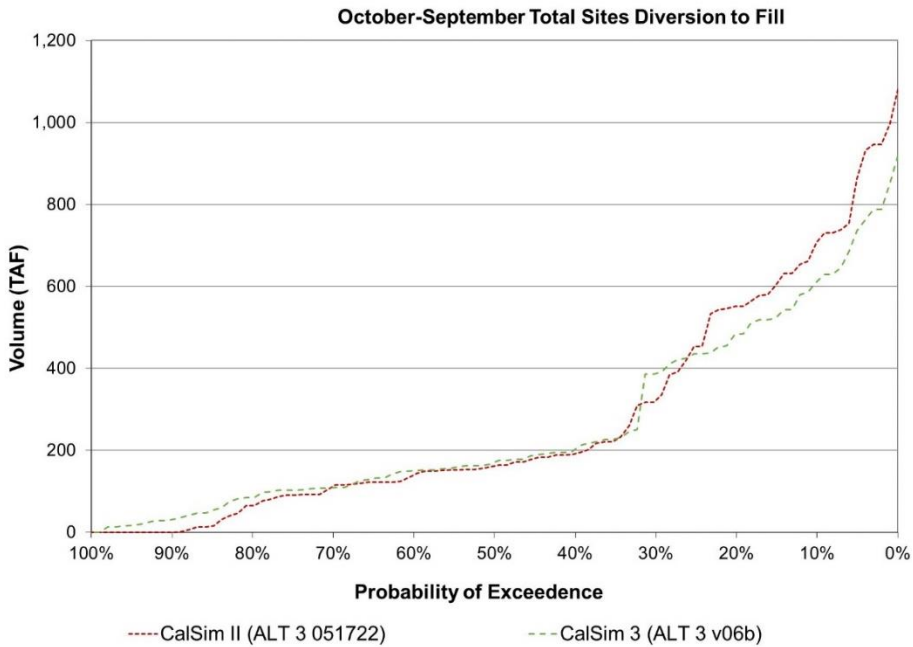


Figure 2. Preliminary CalSim 3 Results - Water Year Diversion Probability of Exceedence compared to CalSim II Alternative 3

**Attachment B:
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>		