

3.5.9. Discussion of CALSIM II results

CALSIM II provides a reasonable representation of CVP/SWP operations for planning level analyses of the potential effects of the FRWP on the CVP/SWP systems, as well as environmental programs and requirements such as CVPIA 3406(b)(2), EWA, minimum instream flows, and Delta salinity requirements. In a few isolated months over the 72-year simulation period there are instances where small changes in system conditions trigger disproportionately large changes in CVP/SWP system operations that are not a direct result of the FRWP. These isolated cases result from CALSIM II's generalized rules and simplified representation of the CVP/SWP systems. Some of these changes in CVP/SWP operations that CALSIM II simulates as occurring in a single month would normally occur over a number of months and not result in the large changes in reservoir storage and flows simulated by the model.

This section outlines specific results of the 2020 LOD CALSIM II action alternatives in comparison to Alternative 1. While the body of the EIR discusses the appropriate conclusions regarding potential impacts of the FRWP, this appendix section focuses on a few specific monthly changes in the model results that appear to be larger than anticipated and assesses the extent that these changes are a direct effect of the FRWP. All years listed are water years (October - September).

3.5.9.1 Alternatives 2-5 comparison to Alternative 1

August 1935

A reduction of 75 TAF in the Trinity Lake import to the Sacramento River in Alternatives 2-5 study results in an increased release from Shasta Reservoir to meet the minimum instream flow requirements at the Navigation Control Point on the Sacramento River. This increased Shasta release reduces Shasta storage by 75 TAF as compared to Alternative 1. In actual operations this reduction in Trinity imports would be spread out over a number of months, but as a result of the simplified reservoir balancing logic in the CALSIM model the reduction occurs in a single month.

September 1940

A shift in simulated operations for September is caused by the model code formulation for estimating the incidental benefit to the SWP from CVPIA 3406(b)(2) operations. In Alternatives 2-5 the base water supply that EWA must guarantee at the end of 1940 is over-estimated by 383 TAF due to this code formulation. This results in a reduction of 164 TAF in EWA purchase water in September, as well as a reduction in simulated Lake Oroville storage of 130 TAF and a reduction of 157 TAF in SWP San Luis Reservoir storage.

November 1941

The EWA accounting adjustment described above for September 1940 results in reduced SWP San Luis Reservoir storage and causes the reservoir to reach the minimum storage level a month earlier in the Alternatives 2-5 study than in Alternative 1. As a result, SWP deliveries are reduced 79 TAF in November of 1941.

February 1941

Simulated Delta outflow drops by 167 TAF in February 1941 in Alternatives 2-5 in comparison to Alternative 1. This drop compensates for the EWA re-operation in September 1940. Simulated Lake Oroville storage is higher in Alternative 1 from September 1940 to February 1941, when it reaches

the flood limit and spills, causing higher Delta outflows. The Alternatives 2-5 study simulated Lake Oroville storage does not have a flood spill in this month, resulting in a lower simulated Delta outflow. This is an example of how earlier operations may cause the system to trend differently in the action alternatives in comparison to Alternative 1. This operational trend is a result of the EWA re-operation in September 1940, and it is therefore attributable to simplified simulated operations in CALSIM II.

December 1978

Simulated Shasta Reservoir storage experiences a 95 TAF drop in Alternatives 2-5 as a result of a reduction in simulated Trinity Lake imports to the Sacramento River of 1130 cfs. Shasta Lake releases must be increased to compensate for the loss of Trinity imports in order to meet minimum instream flow requirements on the Sacramento River below Keswick Dam. In actual operations this reduction in Trinity imports to balance the storages in Trinity and Shasta Lakes would be spread out over a number of months, but as a result of the simplified logic in the CALSIM model the reduction occurs in a single month.

February 1978

Effects from the December 1978 Shasta re-operation carry over into February. Shasta Lake flood control releases in February are reduced by 2166 cfs in Alternative 2-5 since Shasta storage is 120 TAF less at the end of January. This decrease in the simulated Sacramento River flow causes a drop in simulated Delta outflow of 124 TAF. This change in Delta outflow is a function of the simplified representation of Trinity system operations in CALSIM II.

3.5.9.2 Alternative 6 comparison to Alternative 1

September 1940

Similar to Alternatives 2-5, a shift in simulated operations for September is caused by the model code formulation for estimating the incidental benefit to the SWP from CVPIA 3406(b)(2) operations. In Alternative 6 the base water supply that EWA must guarantee at the end of 1940 is over estimated by 400 TAF due to this code formulation. This results in a reduction in simulated Lake Oroville storage of 130 TAF and a reduction of 156 TAF in SWP San Luis Reservoir storage

October 1941

A reduction in SWP deliveries similar to the Alternatives 2-5 study is evident in October and November of this year, precipitated by the simulated EWA operation in September 1940. CALSIM compensates for this shortage condition by increasing simulated SWP South-of-Delta deliveries in December. In February 1941 Lake Oroville flood control releases are reduced in Alternative 6 as compared to Alternative 1 due to lower Oroville storage conditions, resulting in a decrease in Delta outflow.

July 1963

In July of 1963, simulated Lake Oroville storage decreases by 100 TAF in Alternatives 6 as compared to Alternative 1, as a result of the transfer of EWA water from Lake Oroville to the EWA account in San Luis Reservoir. In the Alternative 1 simulation this transfer does not occur because Lake Oroville storage encroaches into flood control space in the spring of 1963 and the entire amount of EWA storage in the reservoir is transferred over to the SWP, since stored EWA water is assumed to spill first. In Alternatives 6, simulated storage in Lake Oroville does not encroach into flood control space in the spring, allowing EWA to retain its Lake Oroville storage, which is then moved to San Luis Reservoir in July. This is not an effect of the FRWP, but rather an EWA re-operation triggered by a slight difference in Lake Oroville storage.

3.5.9.3 Conclusion

Using CALSIM II in a long-term comparative fashion, as it was designed, provides a reasonable basis for assessing project impacts when the results are used in a statistical sense. The isolated months described above are not representative of the potential affects of the FRWP and the differences between project alternatives must be carefully analyzed to differentiate between realistic effects and these isolated modeling artifacts.