

Appendix 5G

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**Comparison of FEIRS Alternative 4A Modeling Results to  
the California Water Fix Section BA Proposed Action  
Modeling Results**

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**EXHIBIT BKS-252**

Both, 2010 and 2015 versions of the CALSIM II represent the current regulatory requirements including the 2008 and 2009 BiOps. 2015 version included several updates related to any new information available for facilities, better implementation of the operational constraints, and other improvements from Reclamation, DWR and other experts. Below is a list of key changes in the 2015 version of the CALSIM II compared to the 2010 version.

- Sacramento River Updates:
  - Added Feather River rice decomposition demands and return flows
  - Added Fremont Weir Notch
  - Modified American River and Sacramento River demand assumptions
  - Added Folsom flood control improvements
  - Modified American River Flow Management Standard (FMS) implementation
- Delta:
  - Added Los Vaqueros Expansion
  - Modified export-Inflow ratio, Hood minimum instream flow, and COA sharing between CVP and SWP
  - Modified health and safety pumping limits
- San Joaquin River:
  - Stanislaus River and New Melones Operations consistent with 2008/2009 BiOps
  - Removed Vernalis Adaptive Management Program (VAMP)
- South-of-Delta (SOD) SOD SWP demand assumptions
- Updated climate change inputs
- Model refinements to better reflect new or updated information available on the ongoing operations and programs
- Other general model improvements and software updates

**Table 5G-1. Summary of the Models Used for the RDEIR/SDEIS, the CWF Section 7 BA and the FEIRS**

	RDEIR/SDEIS Surrogate Models	CWF Section 7 BA Models	Final EIR/EIS Models
No Action Alternative	2010 DEIRS No Action Alternative at ELT	2015 No Action Alternative at ELT	2010 DEIRS No Action Alternative at ELT with Fremont Weir updates noted in Table 5G-2
Alternative 4A	Modeled as a range between 2010 DEIRS Alternative 4 H3 and H4 at ELT	Proposed Action modeled based on the 2015 No Action Alternative at ELT	2010 DEIRS Alternative 4 H3 at ELT updated for Alternative 4A assumptions noted in Table 5G-3

1 **Table 5G-3. Differences between Alternative 4 H3, and Alternative 4A that Potentially Affect the CVP-**  
 2 **SWP Operations. FEIRS Alternative 4A Assumptions are Consistent with the CWF BA Proposed Action.**

	DEIRS Alternative 4 H3 at ELT	FEIRS Alternative 4A at ELT	CALSIM II Assumptions
Fremont Weir modification, and operations	Included as part of CM2	Not specifically part of the Alternative; considered as part of the No Action Alternative	Included; assumptions consistent with the FEIRS No Action Alternative at ELT <sup>1</sup> .
Tidal habitat restoration	Included as part of CM4 (25000 acres at ELT)	Only the restoration required as part of any mitigation requirements beyond the 8000 acres required under FWS (2008) BiOp	Not included; 8000 acres required under FWS BiOp not modeled explicitly in the No Action Alternative or the Alternative.
Shift of D-1641 Emmaton water quality compliance location to Threemile Slough	Included as part of Alternative 4 H3 in the DEIRS	Not included	Not included; Modeled water quality compliance with D-1641 Emmaton requirement consistent with the FEIRS No Action Alternative at ELT.
Spring Delta Outflow beyond D-1641 requirements	Not included as part of Alternative 4 decision tree scenario H3	Required to meet Mar – May average Delta outflow resulting under the No Action Alternative at ELT	Modeled by constraining the total Delta exports by the San Joaquin River i:e ratio requirement under 2009 NMFS BiOp Action IV.2.1, during April and May.

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- 4 Alternative 4 H3 at ELT CALSIM II model from the DEIRS was modified to include the following
- 5 specific changes to represent Alternative 4A at ELT for the FEIRS:
- 6 • ANN used in CALSIM II to simulate flow – salinity relationship in the Delta under DEIRS
  - 7 Alternative 4 H3 ELT was modified to be consistent with the FEIRS No Action Alternative at ELT,
  - 8 which does not include any effects associated with tidal habitat restoration in the Delta.
  - 9 • Assumed D-1641 agricultural salinity compliance location on the Sacramento River at Threemile
  - 10 Slough was reverted back to Emmaton location consistent with the FEIRS No Action Alternative
  - 11 at ELT.
  - 12 • Constrained the total Delta exports (i.e., pumping at both north and south Delta intakes) by the
  - 13 2009 NMFS BiOp Action IV.2.1 San Joaquin River i:e ratio consistent with the No Action
  - 14 Alternative at ELT, to achieve Mar – May average spring Delta outflow under the No Action
  - 15 Alternative at ELT.
  - 16 • Updated north Delta Diversion operation constraints to better reflect the proposed north Delta
  - 17 diversion bypass flow criteria.

<sup>1</sup> When the existing Fremont Weir is spilling, the notch is assumed to be open under the FEIRS No Action Alternative at ELT, unlike the Alternative 4A Action Alternative, which assumes it's closed. This is just a difference in modeling assumption, and there is no intent for differences in the future Fremont Weir modifications and operations between the FEIRS No Action Alternative and the Alternative 4A. The effect of this difference in assumption is minor and limited to winter months of wet and above normal years at high flow conditions. This has no effect on the impact analysis and significance conclusions in any of the resource chapters in this EIR/S.

- 1 • Added an additional constraint for the north Delta diversion to account for fish screen sweeping  
2 velocity constraints.
- 3 • Added an explicit constraint to maintain south Delta pumping of up to 3,000 cfs during Jul – Sep  
4 months.
- 5 • San Luis reservoir operations modified to minimize south-of-Delta shortages during fall months.
- 6 • Updated WSI-DI curves used to determine the water supply allocations in the CALSIM II model.

7 All the remaining CALSIM II assumptions for Alternative 4A remained consistent with Alternative 4  
8 H3.

9 Figures 5G-1 to 5G-43 include the CALSIM II results for CWF BA No Action Alternative at ELT, CWF  
10 BA Proposed Action (PA) at ELT, FEIRS No Action Alternative at ELT and FEIRS Alternative 4A at  
11 ELT. These figures show the similarities and differences between the models used for the FEIRS and  
12 the CWF BA, and also allow assessing how the incremental changes between the Alternative 4A and  
13 the No Action Alternative would differ between the CWF BA and the FEIRS.

14 Several CVP-SWP results including Trinity, Shasta, Folsom, Oroville and San Luis storage conditions,  
15 flows in Trinity River, Sacramento River, Feather River, American River and Delta at key locations,  
16 and CVP-SWP exports and deliveries, are presented in Figures 5G-1 to 5G-43.

17 As noted earlier the No Action Alternative results are similar between the CWF BA and the FEIRS  
18 version. The changes in the CVP-SWP results under the FEIRS Alternative 4A based on the 2010  
19 CALSIM II are similar to the results under the CWF BA Proposed Action scenario based on the 2015  
20 CALSIM II, when compared to their respective No Action Alternative results.

21 Trinity, Shasta and Oroville end of May and end of September storage conditions remained similar  
22 under both the FEIRS Alternative 4A at ELT and CWF BA Proposed Action compared to their  
23 respective No Action Alternative results. Folsom storage conditions generally follow the other  
24 reservoirs, however, in below normal and dry years, the CWF BA Proposed Action is slightly lower  
25 than the CWF BA No Action Alternative, when the FEIRS Alternative 4A is similar to the FEIRS No  
26 Action Alternative. However, deliveries to the CVP American River contractors are not affected as  
27 shown in Figure 5G-34, which shows the annual CVP north of Delta M&I service contractor  
28 deliveries.

29 Changes in San Luis Reservoir storage under FEIRS Alternative 4A are similar to the changes under  
30 the CWF BA Proposed Action, except in dry and critical years, when FEIRS Alternative 4A shows a  
31 reduction in San Luis storage, while CWF BA Proposed Action shows increase.

32 Trinity River flows downstream of Lewiston are similar under the No Action Alternative and  
33 Alternative 4A at ELT under the FEIRS consistent with CWF BA. Sacramento River flows at Keswick  
34 and Wilkins Slough locations under the FEIRS No Action Alternative at ELT and Alternative 4A at  
35 ELT remain similar compared to the respective CWF BA results under all water year types. Feather  
36 River flows in the low flow channel remain unchanged. The changes in the Feather River flows  
37 below Thermalito and American River flow below Nimbus trend similarly under the FEIRS  
38 Alternative 4A at ELT and the CWF BA Proposed Action compared to their respective No Action  
39 Alternative results.

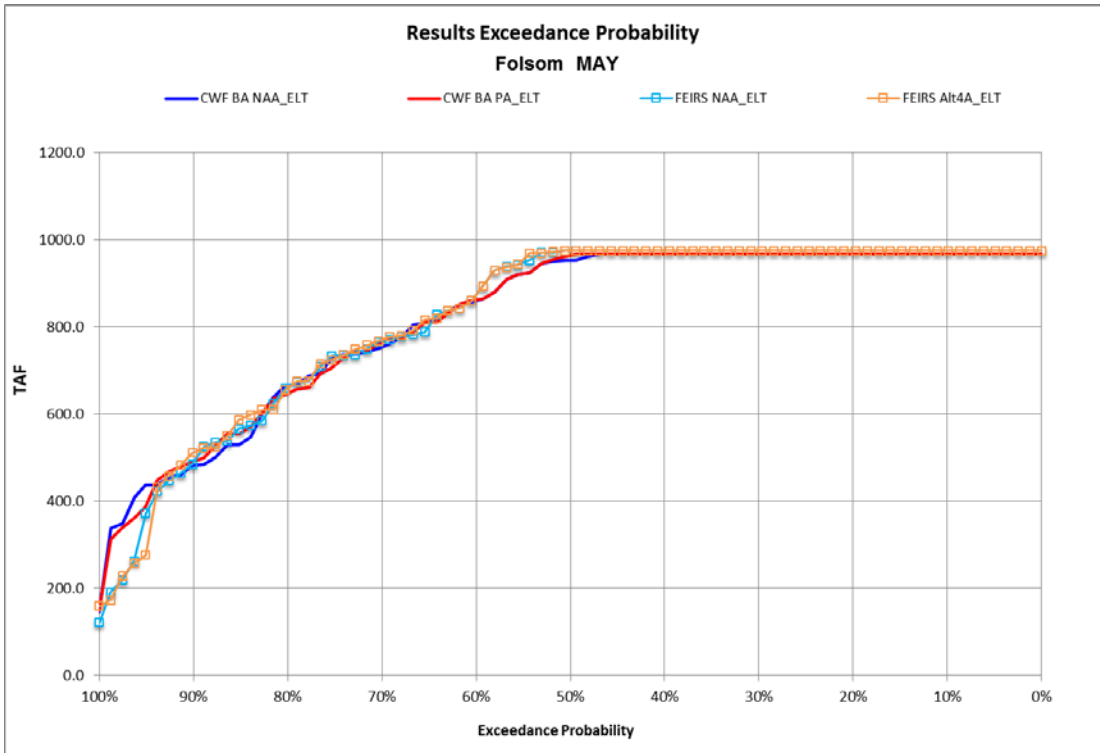


Figure 5G-7. Storage Exceedance Probability for Folsom Lake, End of May

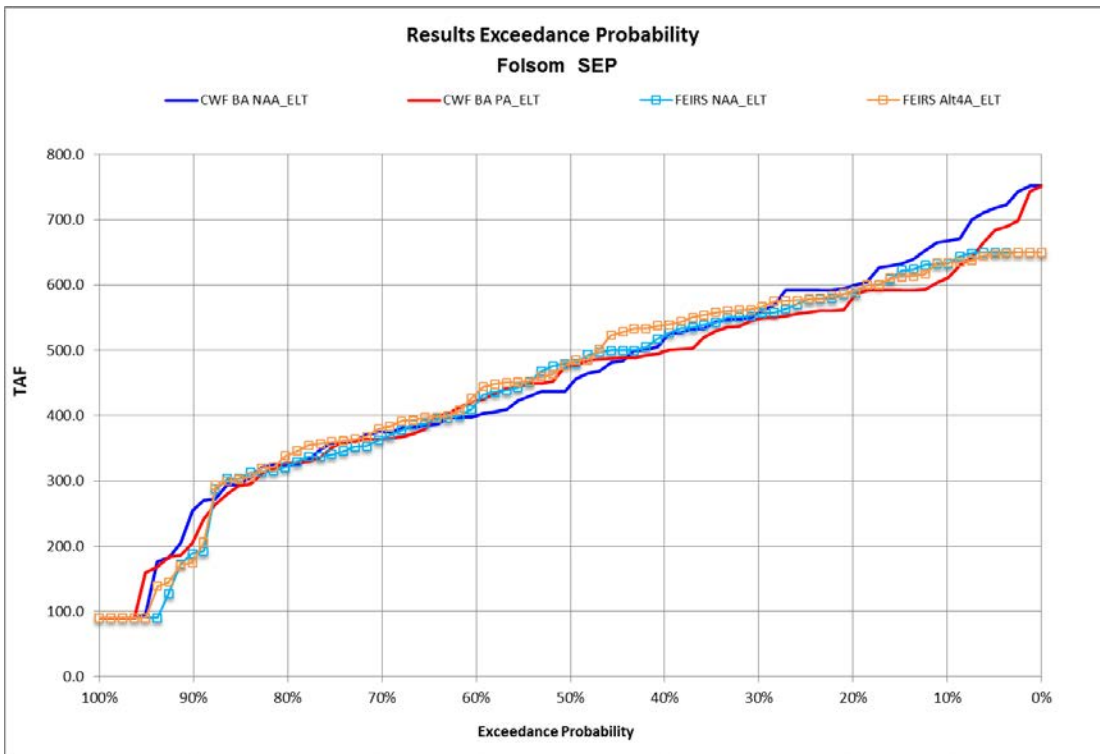
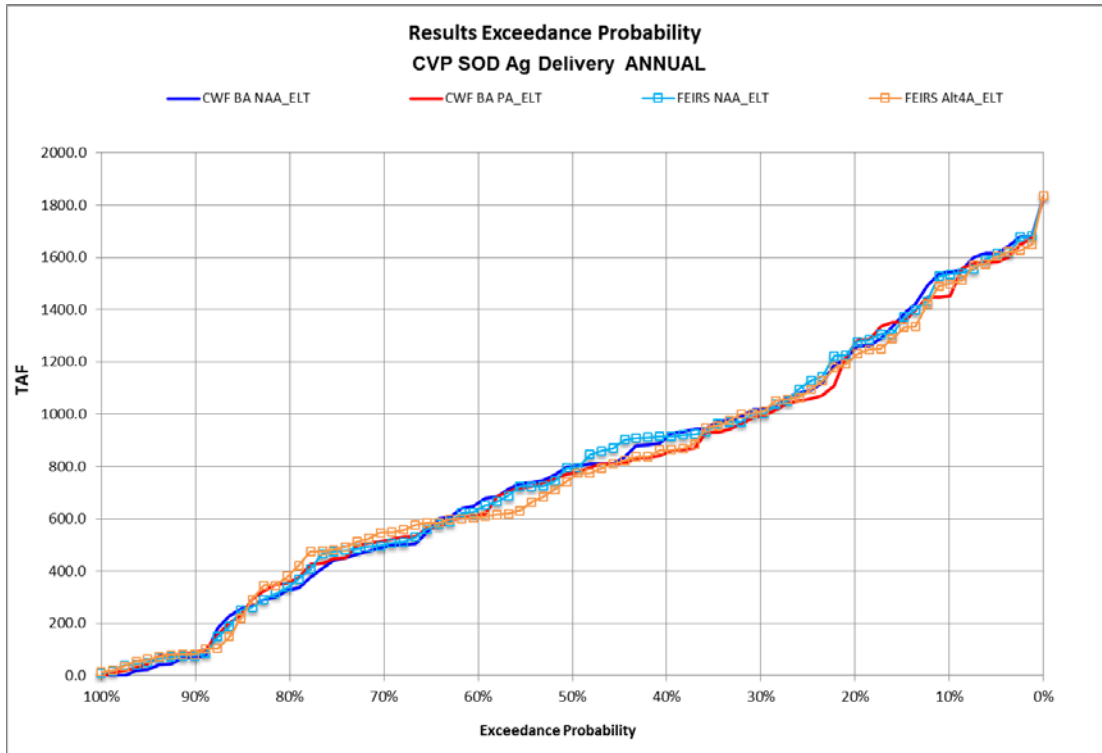


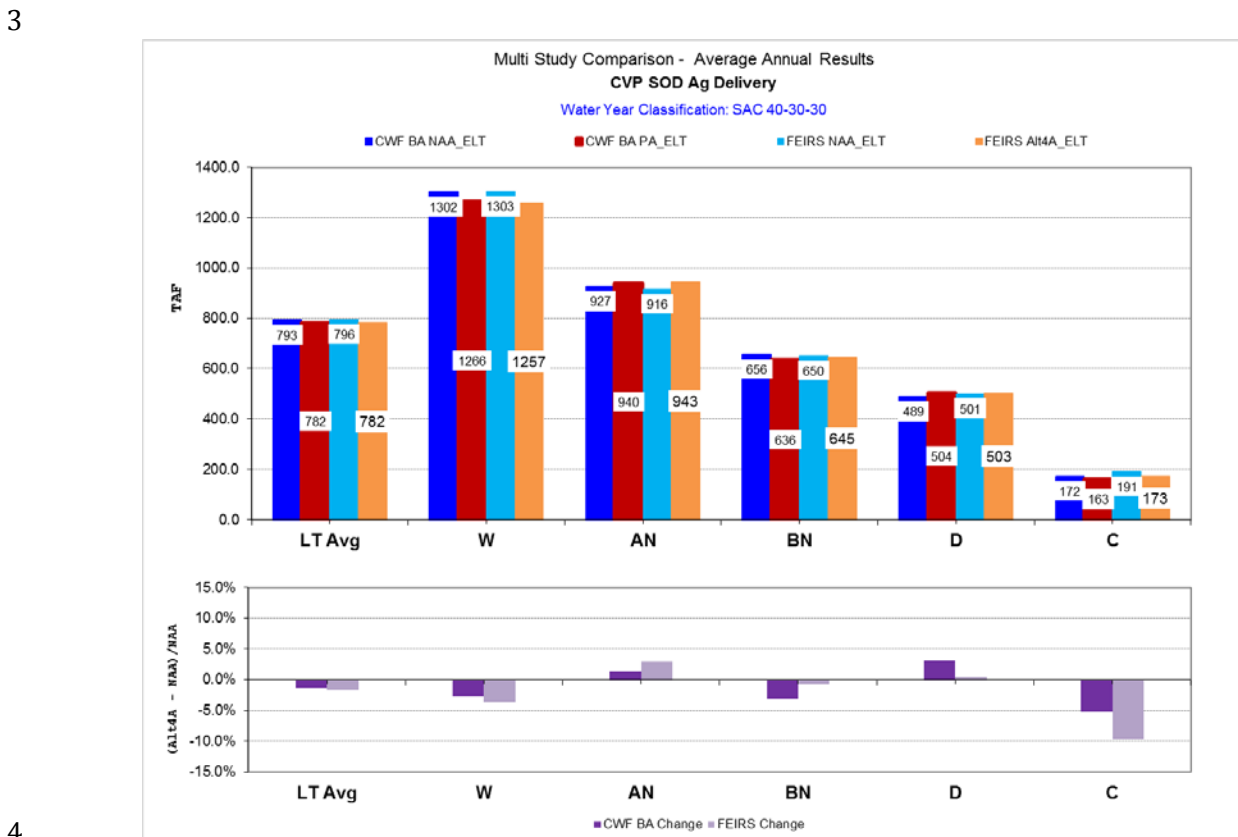
Figure 5G-8. Storage Exceedance Probability for Folsom Lake, End of September

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2 **Figure 5G-37. Annual (Oct-Sep) CVP South-of-Delta Ag Deliveries Exceedance Probability**



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5 **Figure 5G-38. Annual (Oct-Sep) CVP South-of-Delta Ag Deliveries by WYT [WYT per current climate]**