

3.4 SIMULATION RESULTS FOR 2001 LOD

This section provides detailed results from the CALSIM II analyses of the FRWP Action alternatives in comparison to the Alternative 1 (No Action) study at a 2001 Level of Development. Results are displayed in both contract year and water year formats where appropriate, and are typically presented in both exceedence and time series formats. Comparative analyses are emphasized, but absolute data is provided in some instances. Although CALSIM II modeling extended through Water Year 1994, the averages are based on WY 1922-1993 since WY 1994 did not include a full contract year. Results for the dry periods of WY 1928-1934 and WY 1987-1992 are also included, since impacts from the FRWP could potentially be the greatest in these periods. The sections below provide simulated Freeport Project diversions, reservoir storage, river flow, Delta flow, Delta export, CVP delivery, and SWP delivery data.

Section 3.4.10 presents results for a side-bar study that shows the sensitivity of the modeling results to the assumption that CVP deliveries to EBMUD are a Sacramento Valley inbasin use.

3.4.1 Summary Results

Several types of figures are provided in this section to give an overview of the hydrologic modeling results. The emphasis is on the incremental effect of Alternatives 2-5 (Joint Project) compared with Alternative 1 (No-Action), although some comparisons with Alternative 6 are also included. Four periods are evaluated: the full simulation period (WY 1922-1993) and three dry periods (WY 1928-1934, WY 1976-1977, and WY 1987-1992).

Figures 3.4.1-1 through 3.4.1-4 show the average change in simulated flows at several key locations and compare these values with the base values in Alternative 1. These figures only show the incremental change associated with Alternatives 2-5

Figures 3.4.1-5 through 3.4.1-8 show the average change in simulated carryover storage (end of September) for key North-of-the-Delta CVP and SWP reservoirs, as well as Delta exports to the south. For comparison, base values in Alternative 1 are also shown. This set of figures only shows the incremental change associated with Alternatives 2-5

The percentage of the Alternative 1 (No-Action) values for selected parameters are displayed for the action alternatives in Figures 3.4.1-9 through 3.4.1-12. This highlights the relative magnitude of the potential change associated with the FRWP alternatives, as simulated in the modeling.

The last set of figures in this section, Figures 3.4.1-13 through 3.4.1-16, plots selected CVP and SWP parameters expressed as a percentage of the maximum value in Alternative 1. This shows the general state of the CVP during each period, as well as the difference between the FRWP alternatives. For example, over the entire simulation period, CVP North-of-the-Delta carryover storage is approximately 75% of the maximum in any year. However, during the dry year period of 1928-1934, CVP North-of-the-Delta storage is closer to 40% of the maximum in any year of the Alternative 1 simulation.

**Figure Figure 3.4.1-1 Average Change in Simulated Flows, Alternatives 2-5, 2001
LOD (Average of All Years)**

**Freeport Regional Water Project
Alternatives 2-5
Average Change in Flow (Million AF/yr)**

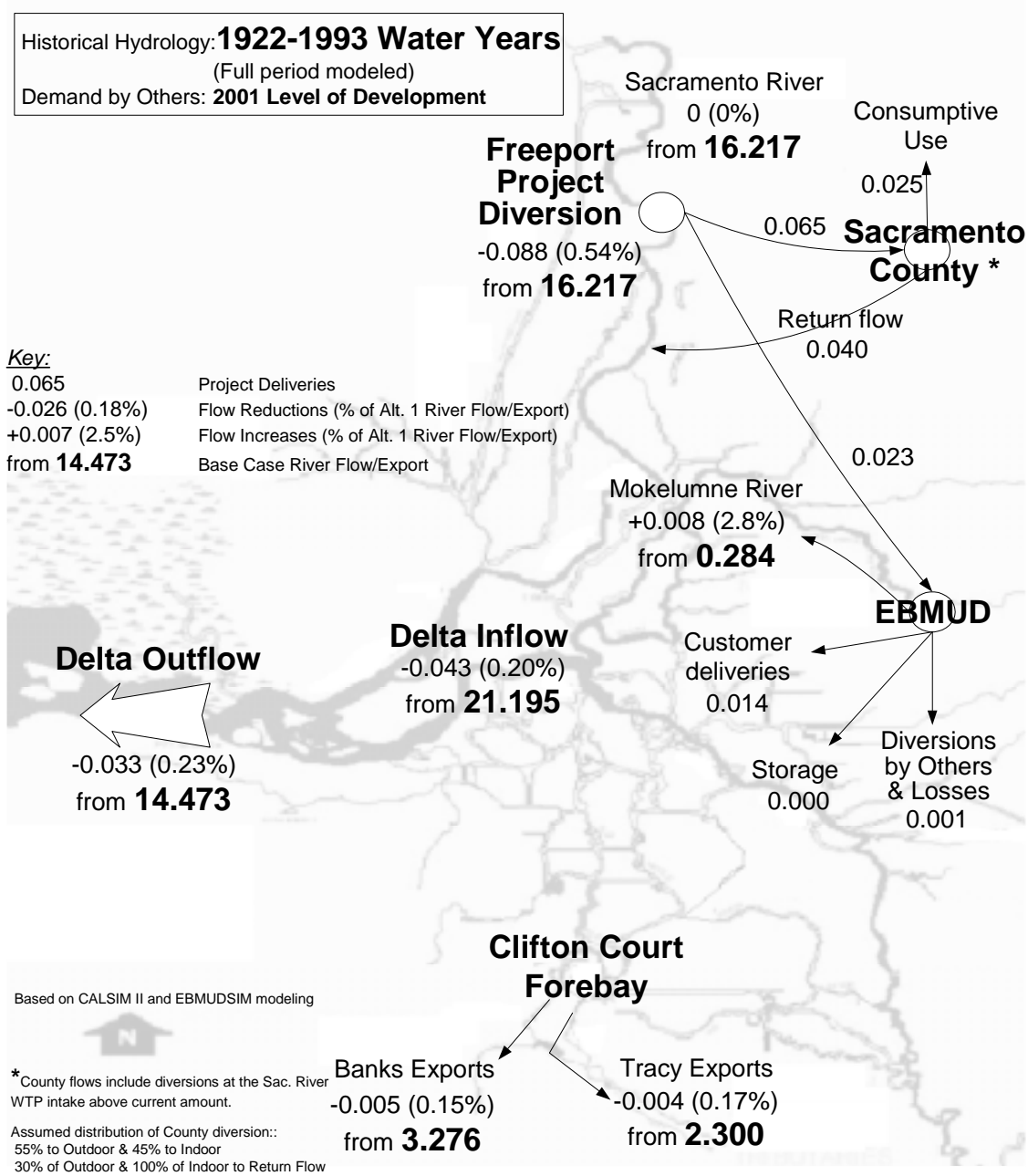


Figure 3.4.1-2 Average Change in Simulated Flows, Alternatives 2-5, 2001 LOD (Dry Period WY 1928-1934)

**Freeport Regional Water Project
Alternatives 2-5**
Average Change in Flow (Million AF/yr)

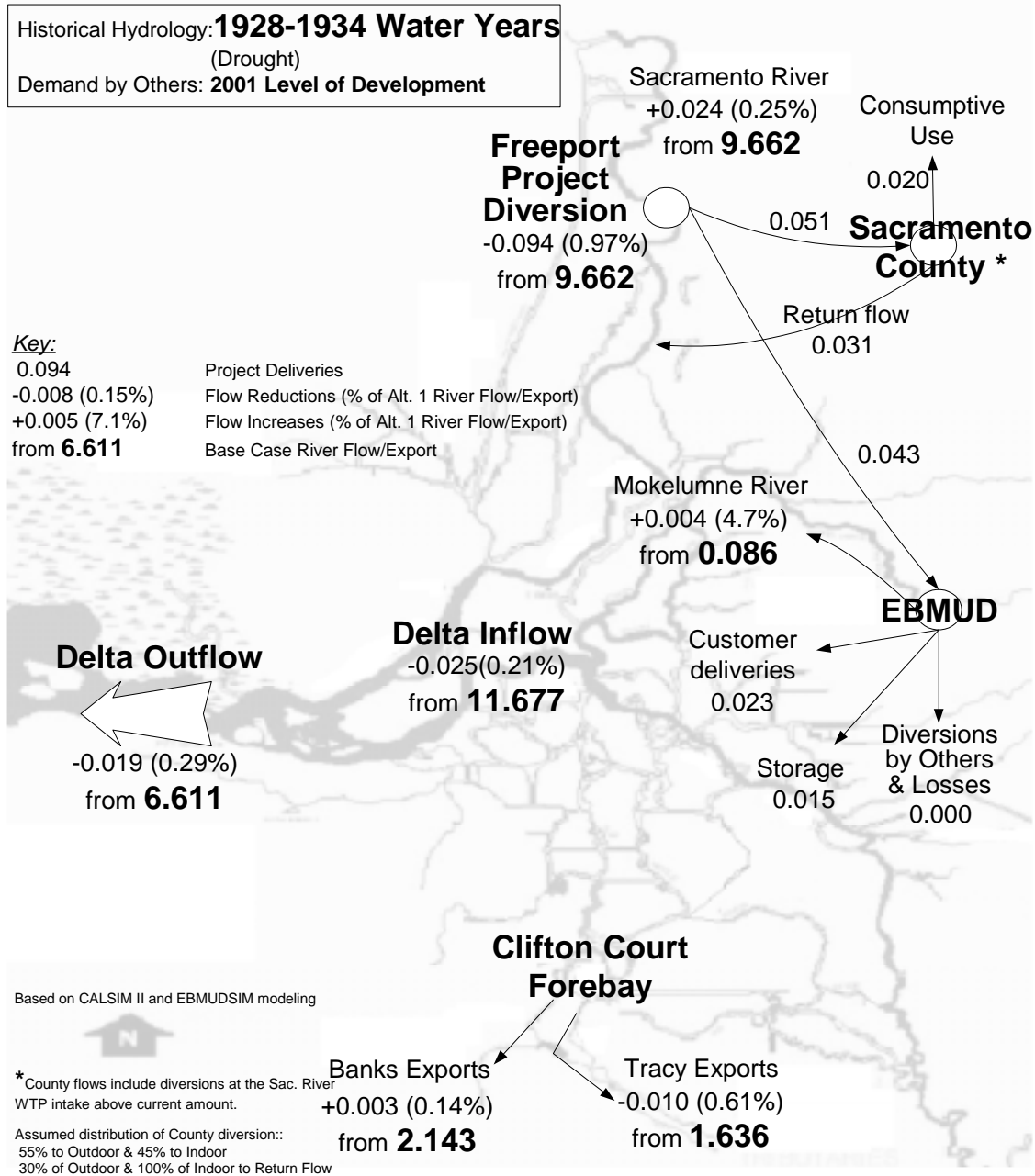


Figure 3.4.1-3 Average Change in Simulated Flows, Alternatives 2-5, 2001 LOD (Dry Period WY 1976-1977)

**Freeport Regional Water Project
Alternatives 2-5
Average Change in Flow (Million AF/yr)**

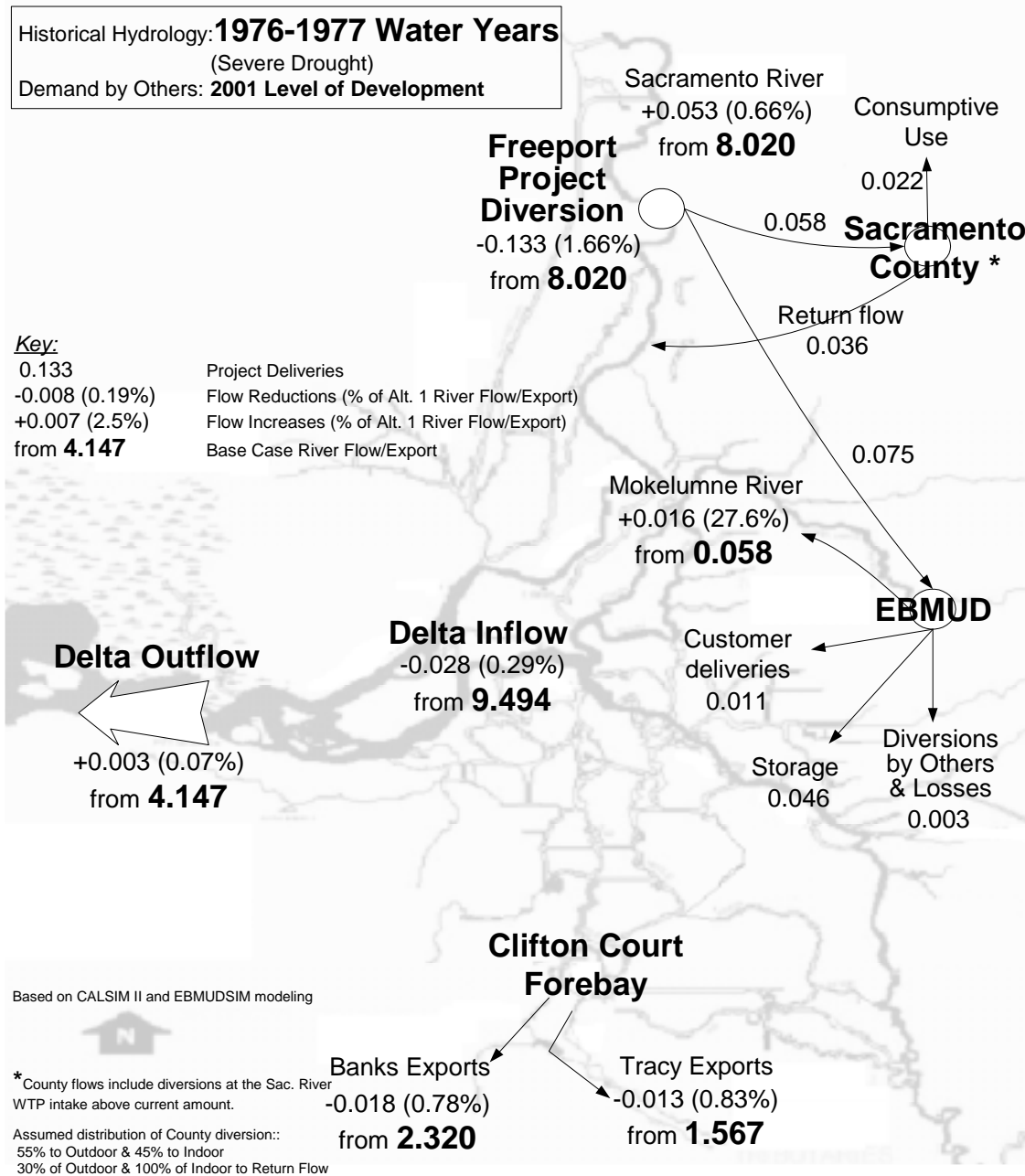


Figure 3.4.1-4 Average Change in Simulated Flows, Alternatives 2-5, 2001 LOD (Dry Period WY 1987-1992)

**Freeport Regional Water Project
Alternatives 2-5**
Average Change in Flow (Million AF/yr)

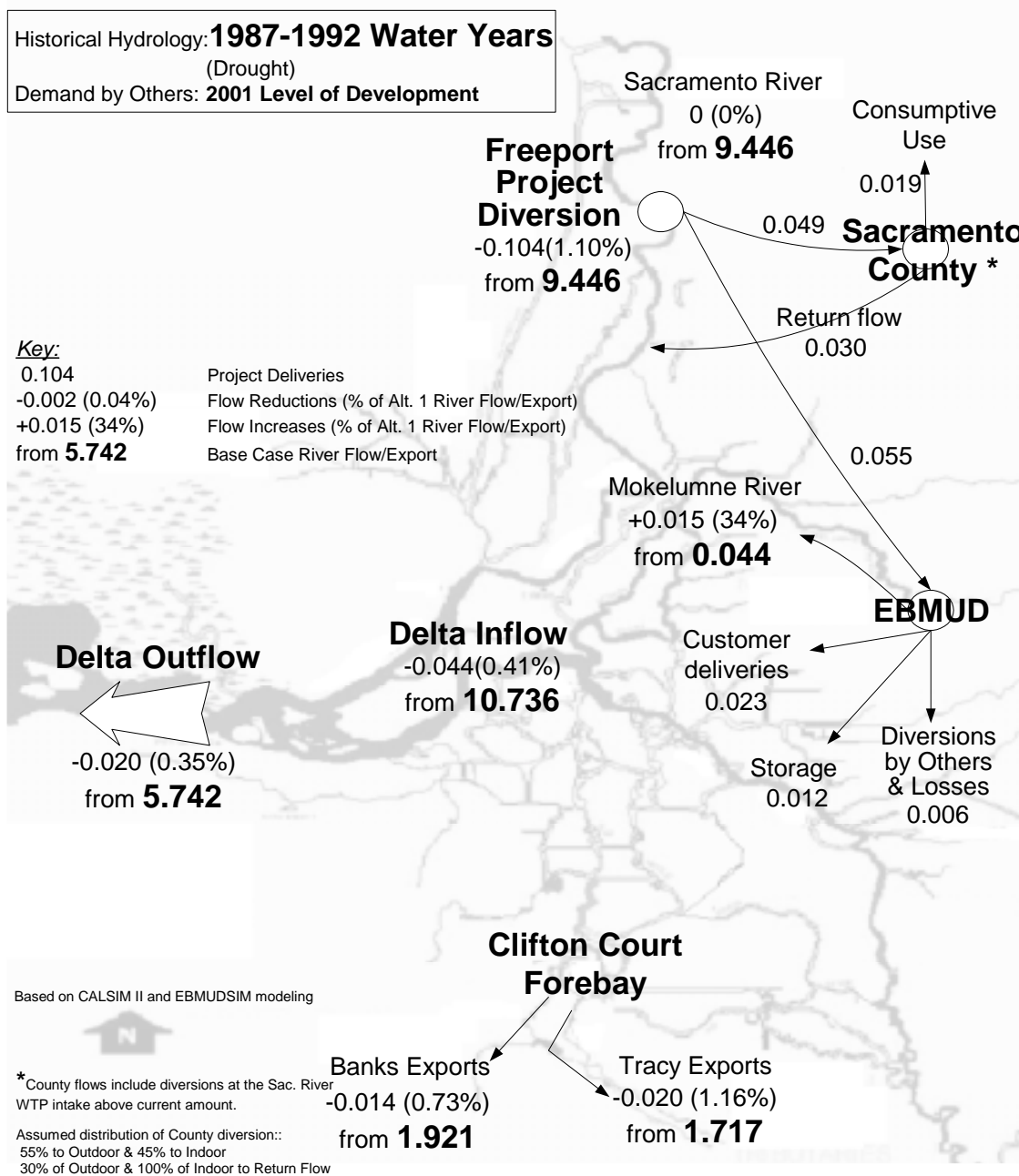


Figure 3.4.1-5 Average Change in Simulated CVP/SWP Operations, Alternatives 2-5, 2001 LOD (Average of All Years)

**Freeport Regional Water Project
 Alternatives 2-5
 Average Change in CVP/SWP Operations**

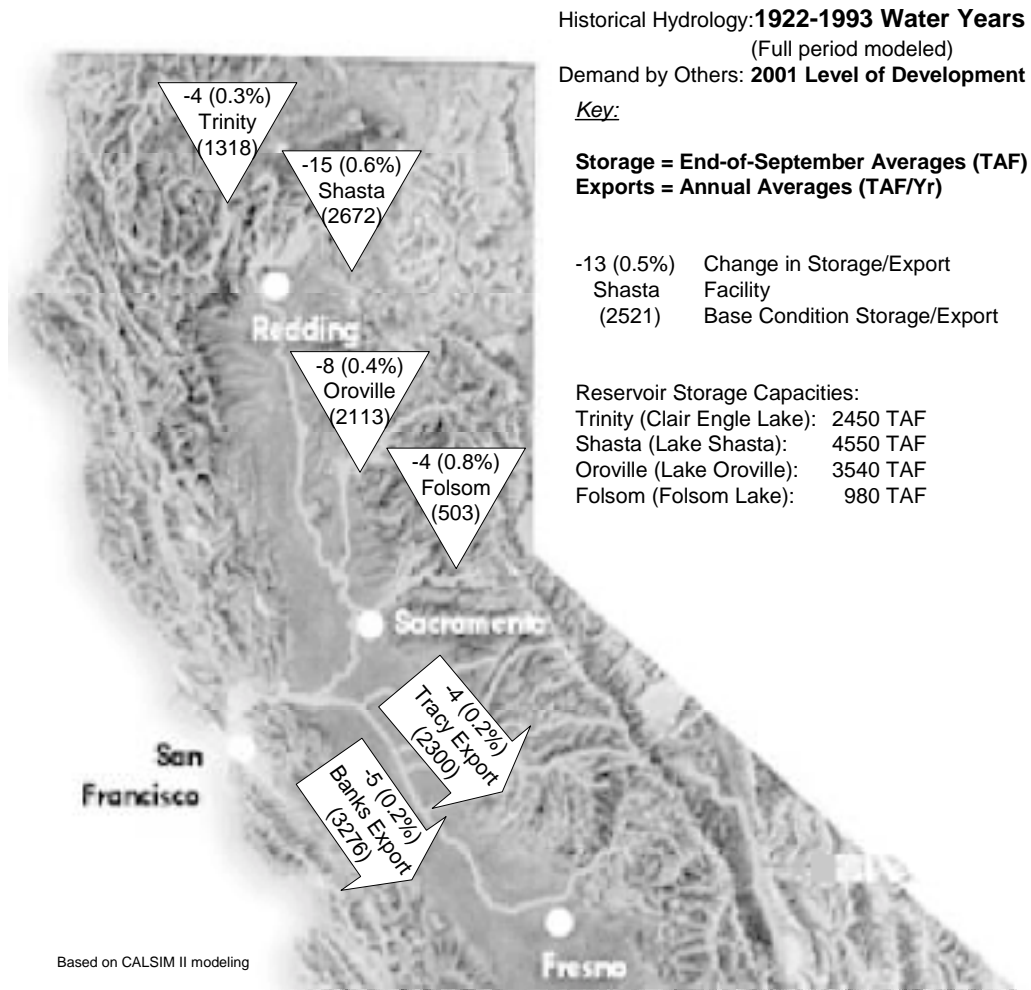


Figure 3.4.1-6 Average Change in Simulated CVP/SWP Operations, Alternatives 2-5, 2001 LOD (Dry Period WY 1928-1934)

**Freeport Regional Water Project
Alternatives 2-5
Average Change in CVP/SWP Operations**

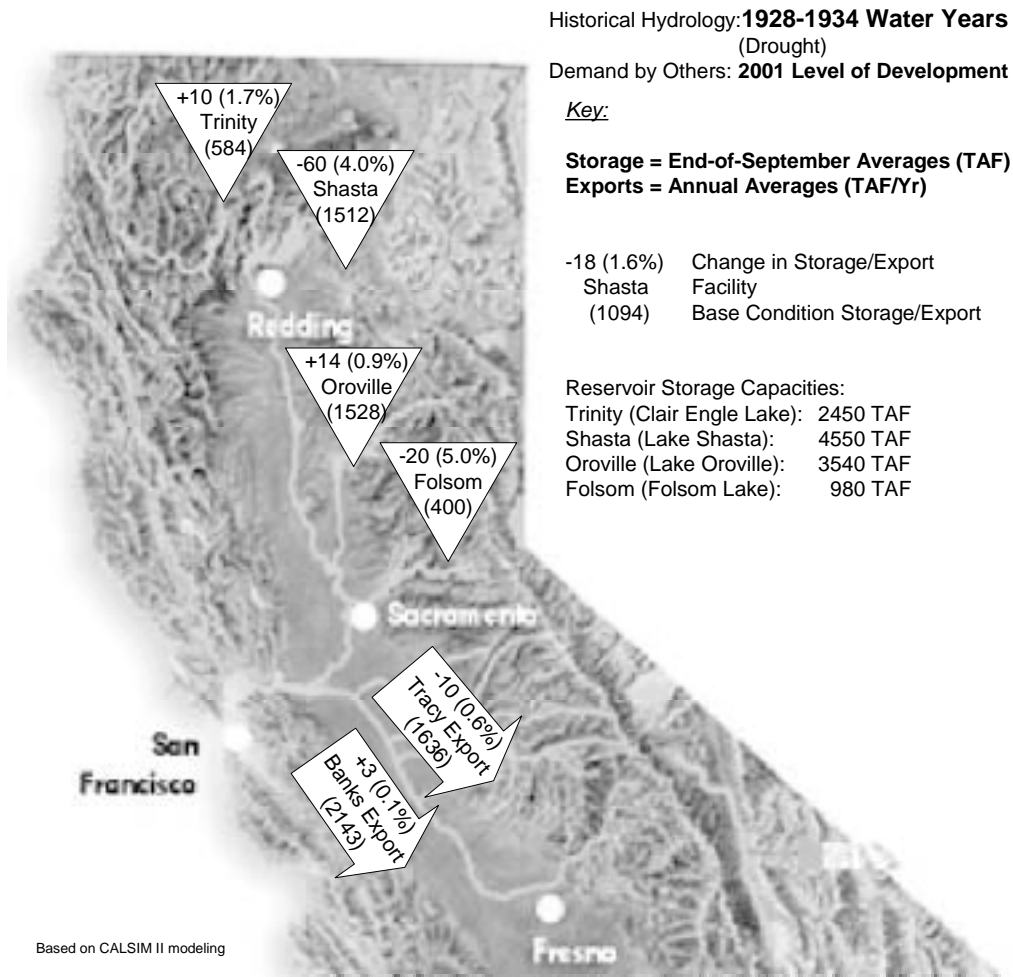


Figure 3.4.1-7 Average Change in Simulated CVP/SWP Operations, Alternatives 2-5, 2001 LOD (Dry Period WY 1976-1977)

**Freeport Regional Water Project
 Alternatives 2-5
 Average Change in CVP/SWP Operations**

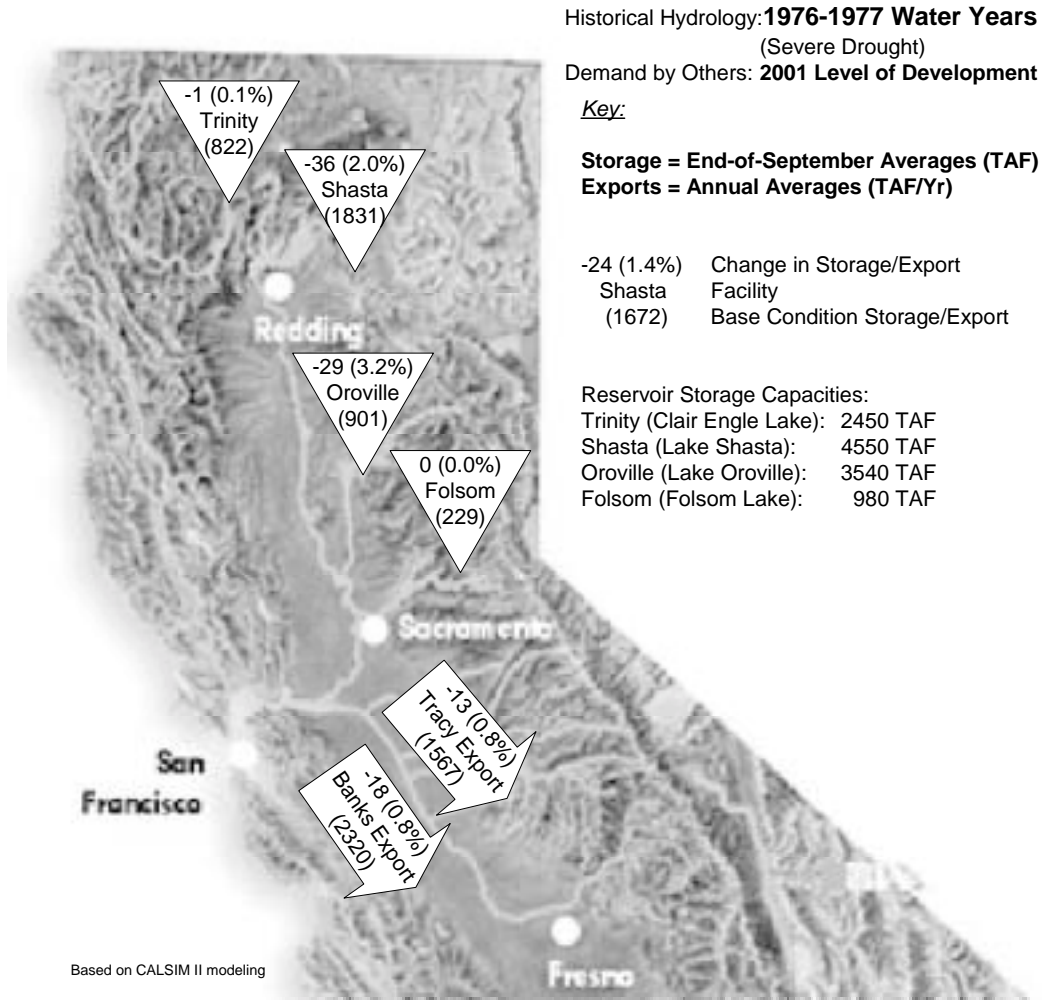


Figure 3.4.1-8 Average Change in Simulated CVP/SWP Operations, Alternatives 2-5, 2001 LOD (Dry Period WY 1987-1992)

Freeport Regional Water Project
Alternatives 2-5
Average Change in CVP/SWP Operations

Historical Hydrology: **1987-1992 Water Years**
 (Drought)

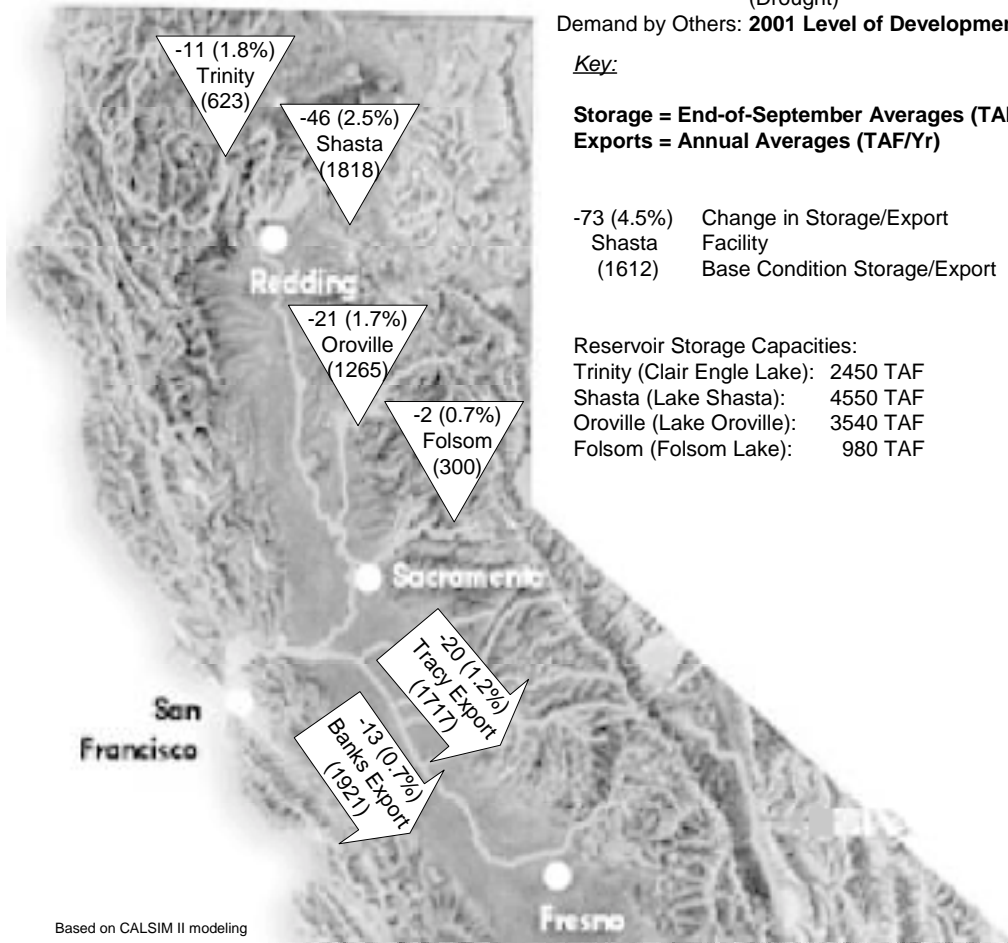
Demand by Others: **2001 Level of Development**

Key:

Storage = End-of-September Averages (TAF)
Exports = Annual Averages (TAF/Yr)

-73 (4.5%) Change in Storage/Export
 Shasta Facility
 (1612) Base Condition Storage/Export

Reservoir Storage Capacities:
 Trinity (Clair Engle Lake): 2450 TAF
 Shasta (Lake Shasta): 4550 TAF
 Oroville (Lake Oroville): 3540 TAF
 Folsom (Folsom Lake): 980 TAF



Based on CALSIM II modeling

Figure 3.4.1-9 Comparison of Alternatives for Selected Parameters, 2001 LOD (Average of All Years)

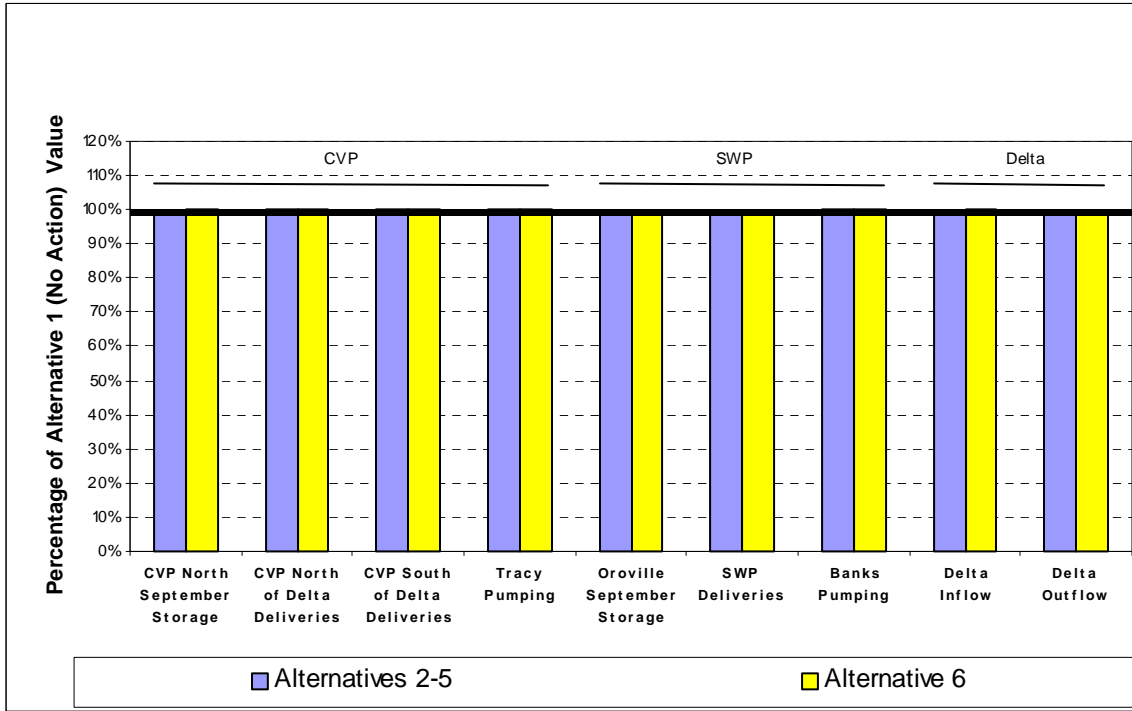


Figure 3.4.1-10 Comparison of Alternatives for Selected Parameters, 2001 LOD (Dry Period WY 1928-1934)

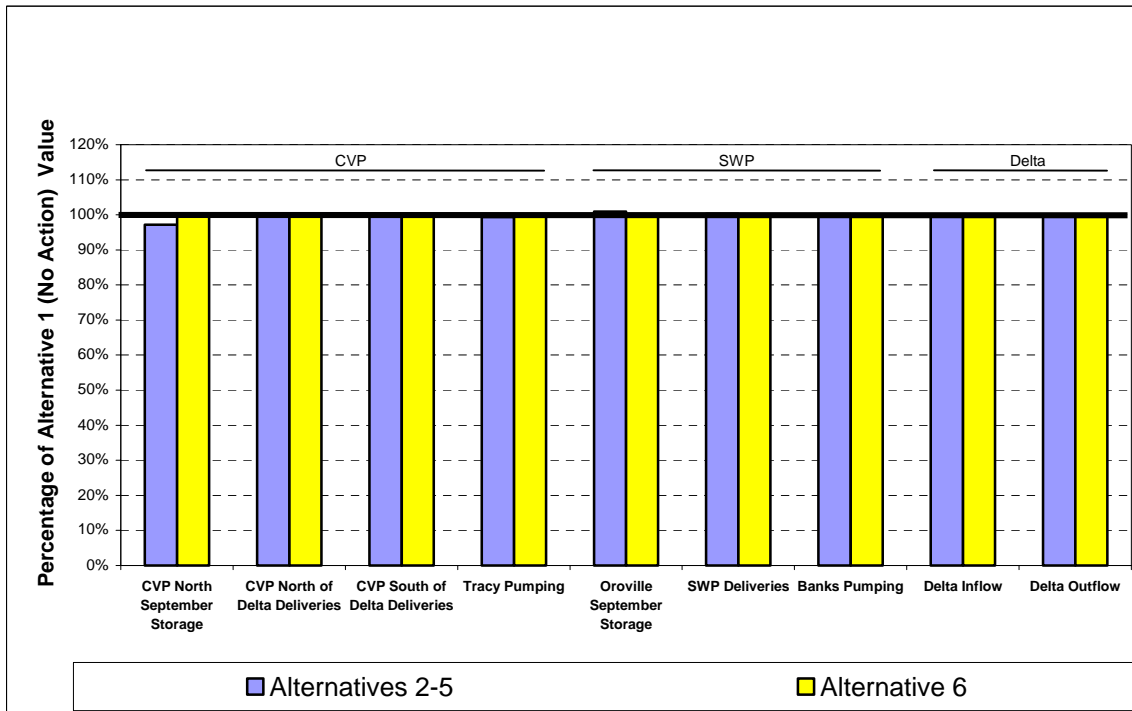


Figure 3.4.1-11 Comparison of Alternatives for Selected Parameters, 2001 LOD (Dry Period WY 1976-1977)

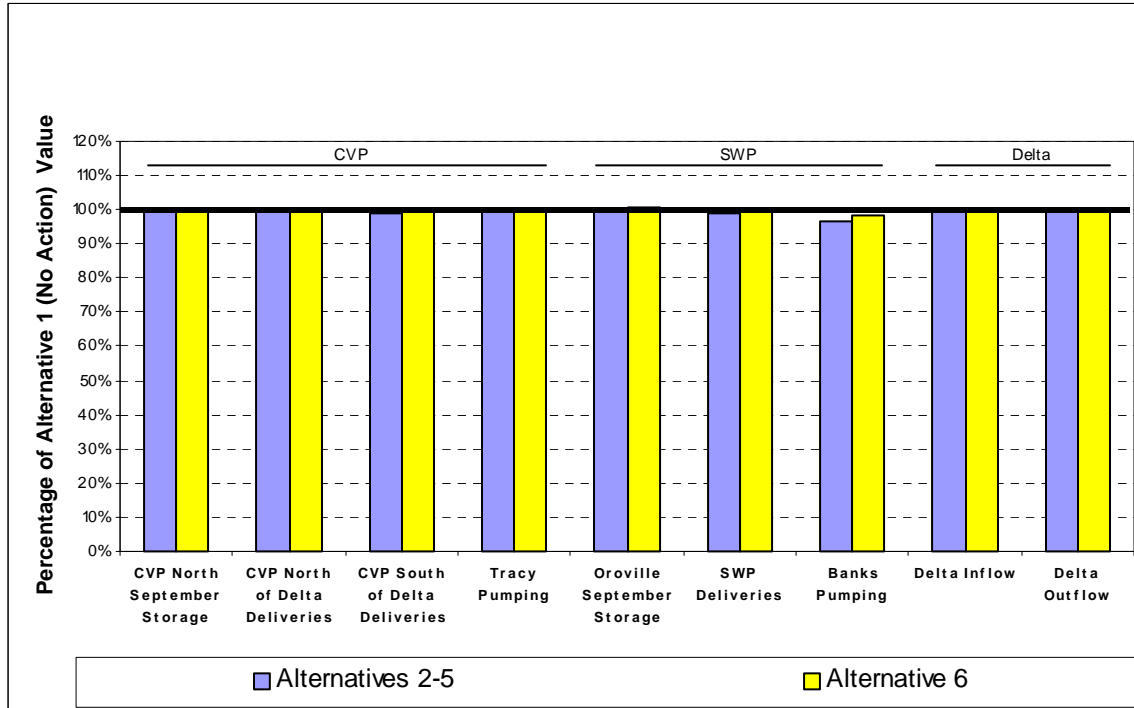


Figure 3.4.1-12 Comparison of Alternatives for Selected Parameters, 2001 LOD (Dry Period WY 1987-1992)

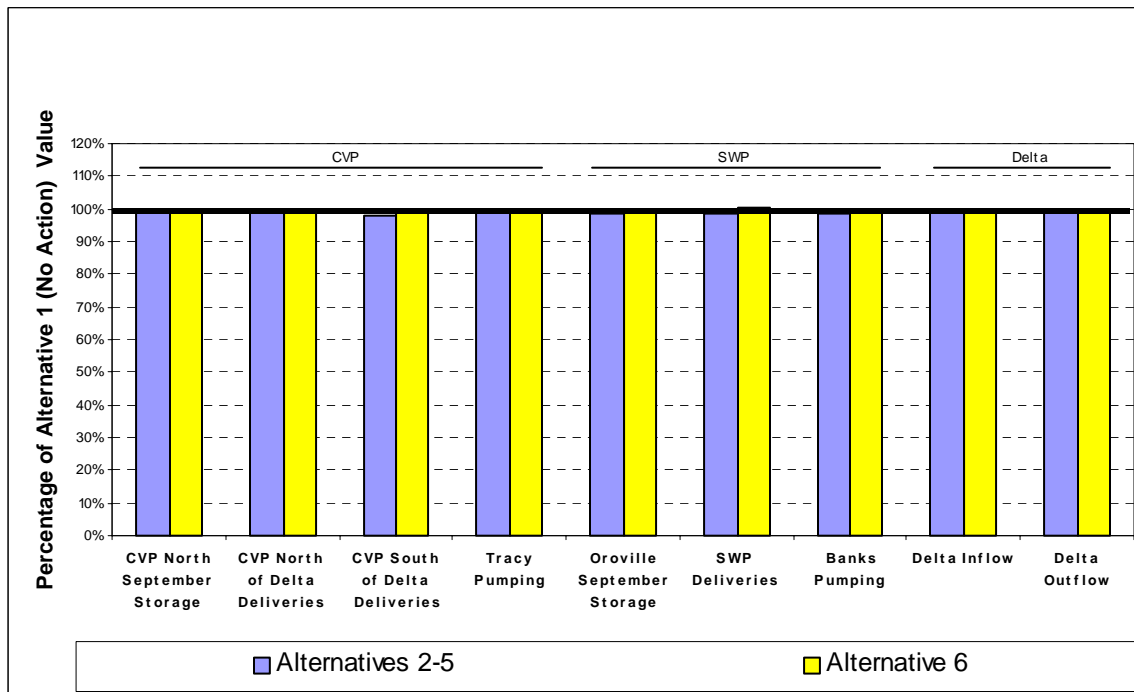


Figure 3.4.1-13 Comparison of Alternatives for Selected CVP and SWP Parameters, 2001 LOD (Average of All Years)

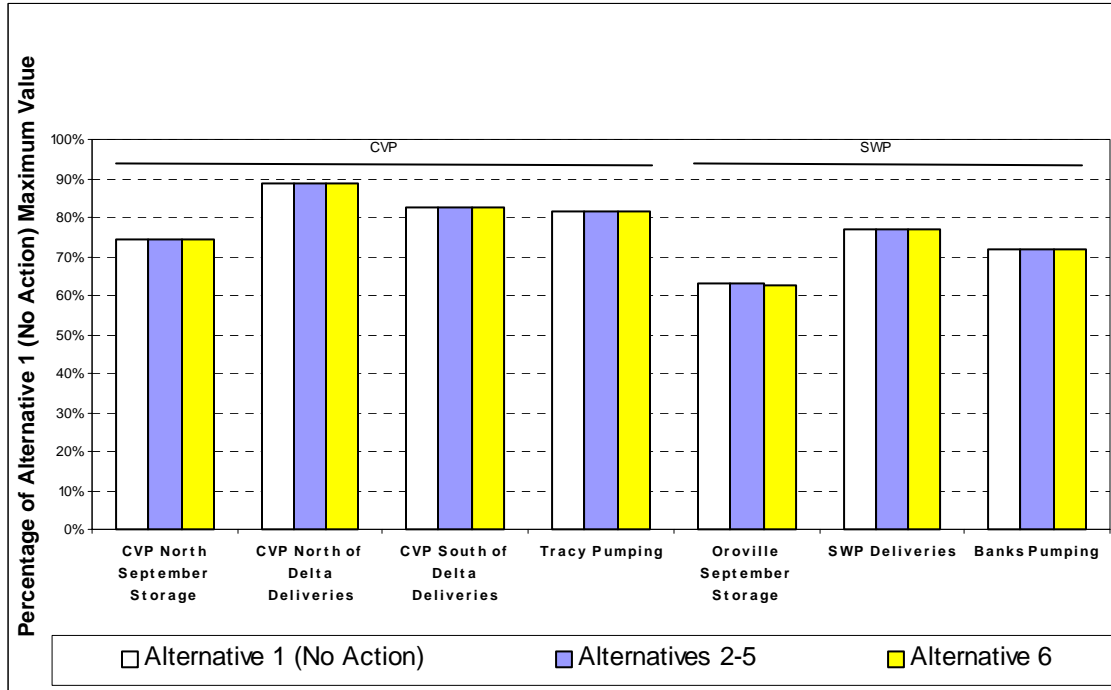


Figure 3.4.1-14 Comparison of Alternatives for Selected CVP and SWP Parameters, 2001 LOD (Dry Period WY 1928-1934)

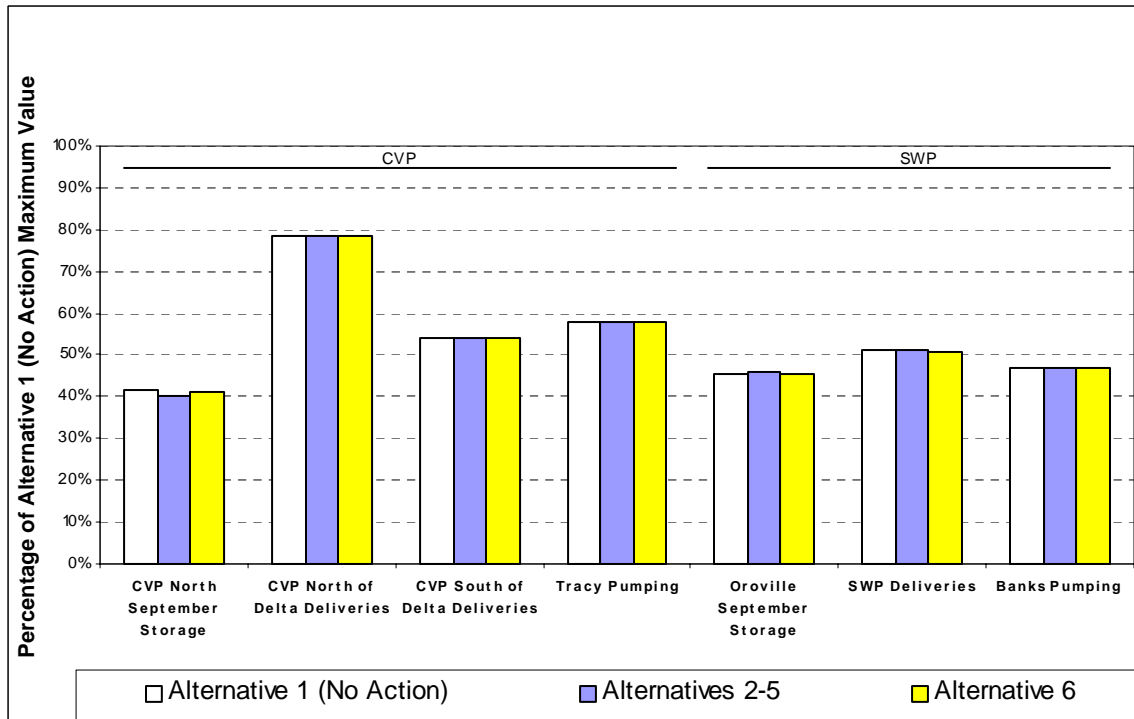


Figure 3.4.1-15 Comparison of Alternatives for Selected CVP and SWP Parameters, 2001 LOD (Dry Period WY 1976-1977)

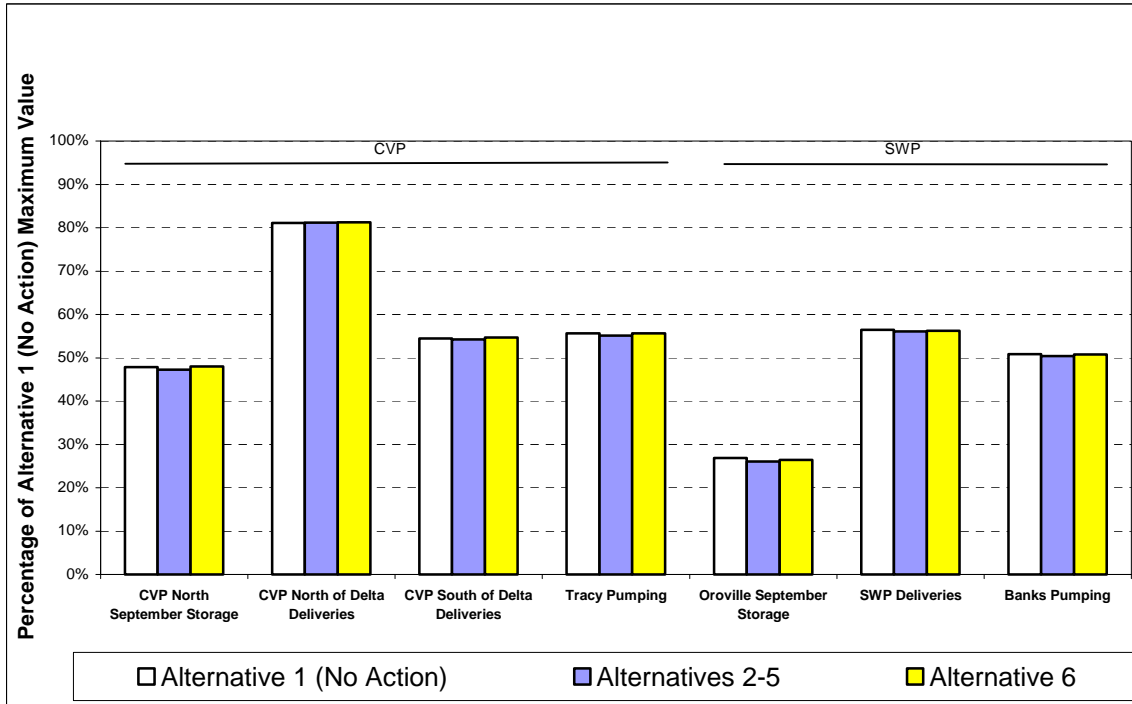


Figure 3.4.1-16 Comparison of Alternatives for Selected CVP and SWP Parameters, 2001 LOD (Dry Period WY 1987-1992)

