

PRELIMINARY DRAFT - SUBJECT TO REVISION

**DWR PLANNING SIMULATION MODEL (DWRSIM) ASSUMPTIONS FOR
CALFED CONVEYANCE/STORAGE COMPONENT REFINEMENT STUDIES**

The following assumptions overlay CALFED Benchmark Study 472:

I. SYSTEM DESCRIPTION

The modeled system includes all existing CVP and SWP facilities and various combinations of the following CALFED conveyance/storage components. For modeling convenience, these components are assumed to be SWP facilities.

A. H.O. Banks Pumping Plant Improvements (BPP): Facilities required to obtain a permit to operate Banks Pumping Plant at 10,300 cfs capacity are assumed. (Not included in Benchmark run).

B. North-of-Delta Surface Storage (NDSS): This facility diverts spills and unregulated flows from Shasta and/or Oroville Reservoirs. Facility location is assumed in the foothills west of Colusa.

C. North-of-Delta Groundwater Storage (NDGS): The groundwater storage facilities are modeled as a single basin with composite hydrogeologic characteristics. Facility location is assumed north of Sacramento.

D. Delta Conveyance (DC): Conveyance is provided through existing Delta channels and/or an isolated facility at in the vicinity of Hood. State-of-the-art screening is assumed such that facility operations are not restricted by "take" limits. It is further assumed that operational flexibility would be maintained under a "no net water supply cost" provision managed by the CALFED operations group.

E. In-Delta Storage (IDS): Three or more islands provide in-Delta storage. These islands are physically linked to Clifton Court Forebay.

F. South-of-Delta Surface Storage (SDSS): Facility location is assumed near the existing San Luis Reservoir.

G. South-of-Delta Groundwater Storage (SDGW): Facility location is assumed on the Kern River fan.

II. SYSTEM STORAGE AND RELEASE CONSIDERATIONS

A. In any year, flows that follow a monthly "flushing" volume of at least 550 TAF may be diverted to NDSS, NDGS and IDS. All diversions are in accordance with SWRCB's May 1995 Water Quality Control Plan and selected upstream ESA and CVPIA flow criteria. Diversions are also subject to facility diversion and storage capacities.

B. All new surface storage is included in system carryover. However, only a fraction of new groundwater storage is included in system carryover. The Benchmark study delivery-carryover storage curve is modified to account for increased carryover with added facilities.

C. The order of priority for operation of storage diversions upstream of export facilities is as follows: (1) NDGS, (2) NDSS and (3) IDS. The order of priority for storage diversions downstream of export facilities is as follows: (1) SDGS, (2) SDSS and (3) SWP San Luis Reservoir.

D. The order of priority for storage releases to meet demands is as follows: (1) IDS, (2) SDSS, (3) SDGS and (4) SWP San Luis Reservoir. The order of priority for storage transfer is as follows: (1) NDSS and (2) NDGS.

E. Oroville releases are balanced with NDSS releases.

F. SWP San Luis releases are balanced with SDSS releases.

III. OPERATION OF COMPONENT FACILITIES

A. North-of-Delta Surface Storage (NDSS)

1. Maximum and minimum reservoir storage capacities are 3 MAF and 50 TAF, respectively. Evaporation losses and local inflows are incorporated in reservoir operations.
2. Maximum reservoir diversion and release capacity is 5,000 cfs. Monthly diversion rates are a function of flows in excess of those required to meet existing standards and the monthly thresholds provided in Item IIA.

B. North-of-Delta Groundwater Storage (NDGS)

1. An operable capacity of 500 TAF is assumed.
2. Natural recharge from streamflow depletion is assumed to be a function of available storage capacity. The aggregate annual percentage of available storage applied in the five years subsequent to the last project withdrawal or recharge operation is assumed as follows: 25% in the first year, 14% in the second year, 10% in the third year, 7% in the fourth year and 5% in the fifth year.
3. A maximum recharge rate of 500 cfs and a maximum pumping rate of 1,000 cfs are assumed.
4. A maximum annual extraction of 425 TAF is assumed.
5. Net depletion of groundwater storage is not permitted over the study period.

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C. Delta Conveyance Facilities (DC)

- 1. DC is modeled as a combination of through-Delta and isolated facility conveyance.
- 2. The size of existing cross channel gates is increased to accommodate higher conveyance through Delta channels.
- 3. The maximum capacity of the isolated component of DC is 15,000 cfs.
- 4. Monthly conveyance through the isolated component of DC can be limited to specified percentages of total Delta export to address south Delta water quality problems:

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
XX											

Alternatively, monthly minimum through-Delta flows can be specified.

- 5. Two export-inflow ratios will be considered when diversions are made through the isolated component of DC:

- a. Diversion are excluded from Delta inflow and export computations.
- b. Diversion are included in Delta inflow and export computations.

- 6. The May 1995 WQCP limits April 15 - May 15 Delta exports to 1,500 cfs or 100 percent of the San Joaquin River flow at Vernalis, whichever is greater. The isolated component of DC could be excluded from this constraint.

D. In-Delta Storage Facilities (IDS)

- 1. Diversions are classified as exports in the export-inflow ratio and follow the export-inflow ratio criteria.
- 2. Diversions are stored in accordance with the priorities outlined in Item IIC.
- 3. Maximum storage capacity is 400 TAF.
- 4. Maximum diversion and release capacity is 5,000 cfs.
- 5. Facilities are physically linked to Clifton Court Forebay through siphons. Therefore, releases from storage are not limited by the export-inflow ratio and do not require additional screening.
- 6. Evaporation losses are included in Delta consumptive use estimates.

E. South-of-Delta Surface Storage (SDSS)

1. Maximum and minimum reservoir storage capacities are 1.50 MAF and 50 TAF, respectively. Evaporation losses and local inflows are included in reservoir operations.
2. Maximum diversion and release capacity is 3,500 cfs.
3. San Luis (SWP) and SDSS operations are triggered by combined south-of-Delta target storage (South-of-Delta rule curve). This combined storage is filled during some high outflow periods and with storage transfer from upstream reservoirs.
4. First priority is given to SDSS diversions and releases when balancing with San Luis Reservoir operations (see Items IIC and IID).

F. South-of-Delta Groundwater Storage (SDGS)

1. Maximum storage capacity is 500 TAF.
2. Recharge operations are based on surplus Delta outflow and storage transfer.
3. Maximum recharge and extraction capacities are 500 cfs and 1,000 cfs, respectively.
4. Recharge and extraction are functions of SWP delivery and Oroville storage.

IV. CONVEYANCE/STORAGE COMPONENT REFINEMENT STUDIES

A. The following studies have been defined and exclude a BPPI component:

Study	Delta Conveyance (cfs)		Surface & Groundwater Storage (MAF)				
	Thru	Isolated	NDSS	IDS	SDSS	NDGS	SDGS
1995C6D-CALFED-473 (Alt 1)	existing	15,000	3.0	0.4	1.5	0.5	0.5
1995C6D-CALFED-474 (Alt 2)	15,000	0	3.0	0.4	1.5	0.5	0.5
1995C6D-CALFED-475 (Alt 3)	0	15,000	0	0	0	0	0
1995C6D-CALFED-476 (Alt 4)	existing	5,000	0	0	1.5	0	0.5
1995C6D-CALFED-477 (Alt 5)	existing	10,000	1.5	0.2	0.75	0.25	0.25

B. Alternatives 6-11 are similar to the benchmark study (Study 472) and the above component refinement studies, except that BPPI is included.