

DRAFT
CALFED Bay-Delta Program
Storage Considerations for Optimized and Preferred Alternatives

Overview

New storage could provide a variety of benefits that promote Bay-Delta Program objectives, including conservation of surplus flows for re-release during times of environmental and water supply need, temporal shifting of Delta exports, and flood control. The downside of storage includes local terrestrial and aquatic impacts, diversion and water temperature impacts on fisheries, and high costs.

Because site-specific evaluations will not be completed in Phase 2 of the Bay-Delta Program, it is not possible to identify specific costs, benefits, and environmental impacts associated with new storage. For these reasons, it will not be possible to identify specific storage targets for the optimized or preferred alternatives. Rather, during Phase 2 of the Bay-Delta Program, a range of potential new storage will be identified that is consistent with the Program Mission and multiple Program Objectives.

In defining this range, the minimum quantity of storage will be the volume required to make the alternative work. For example, some minimal amount of storage might be required to provide water for ERPP flow targets or to allow temporal shifting of Delta export pumping to reduce entrainment effects during critical fishery periods and to maintain adequate water supply reliability. The maximum amount of storage will be defined as that quantity which provides significant incremental water supply benefits, given the operational restrictions associated with any given alternative. For example, changes in Delta flow patterns associated with new storage (annual patterns of Delta inflow, outflow, and exports) must be consistent with ecosystem restoration and water quality goals. If under any given alternative, exports must be substantially restricted to achieve necessary protection for fisheries or water quality, the maximum volume of storage that provides significant incremental water supply benefits might be reduced.

Definitive plans for new storage will depend on future site-specific environmental documentation and more detailed studies of potential benefits and costs. Construction of any new storage is dependent on obtaining required permits and complying with all applicable regulations. Concurrently, once more detailed information is available, local agencies must determine if the benefits and costs of new storage are consistent with local integrated resource management plans.

Storage options include groundwater conjunctive use programs and surface storage projects. Generally, groundwater conjunctive use programs offer the advantages of lower costs and reduced on-site environmental impacts compared to surface storage. Primary disadvantages include an increased fluctuation in groundwater pumping levels for local ground water users, potential subsidence and groundwater quality impacts, and limited input and extraction rates compared to surface storage projects. Groundwater conjunctive use programs can be facilitated

with new surface storage that allows storage of surplus water during typically brief high flow periods. This stored water can later be transferred to groundwater storage at slower rates.

Preliminary evaluation indicates that there is potential for at least an additional 250 TAF of groundwater storage in the Sacramento Valley and 500 TAF in the San Joaquin Valley. The Bay-Delta Program optimized and preferred alternatives should include these volumes of groundwater storage, to be considered for development according to the following principles:

- Conjunctive use programs will be voluntary.
- Groundwater will first be used to meet area of origin needs.
- Transfers outside the basin will involve appropriate compensation for the resource.
- Pilot programs, in addition to computer models, will be used to evaluate local conjunctive use potential.
- Conjunctive use projects will be overseen by a local agency that implements "interest-based negotiation," allowing stakeholder concerns to be addressed.

Preliminary systems operation modeling indicates that under existing Bay-Delta standards, practicable limits for new surface storage for the purposes of water supply are on the order of 3 MAF in the Sacramento River Basin and 2 MAF for south of Delta off-aqueduct storage. At these limits, the majority of ultimate potential water supply benefits are achieved. (See *Evaluation of Upstream of Delta Off-Stream Storage and South of Delta Off-Aqueduct Storage Using the CALFED Post-Processing Spreadsheet Operations Model*, May 9, 1997.) Practical limits for San Joaquin River Basin storage have not been formally evaluated, but consideration of surplus flows and potential storage sites suggests a limit on the order of 500 TAF. Practical limits for in-Delta storage have also not been formally evaluated. A limit of 200 TAF is proposed, recognizing that in-Delta storage results in significant agricultural land conversion.

These limits provide a starting place for defining the maximum storage quantities to be included in the optimized and preferred alternatives. These maximum storage volumes might be further constrained by limitations on Delta exports required for ecosystem restoration or water quality goals. These limitations would likely depend on the Delta improvements included in the optimized and preferred alternatives. For example, under Alternative 1, potential entrainment effects of south Delta pumping might restrict the annual opportunities for increased exports. Under these conditions, the water supply benefits of new storage would be reduced, resulting in practical maximum storage volumes below the limits identified above. Additional modeling would be required to make this determination.

Minimum storage volumes might be constrained by storage required to meet ERPP flow targets and to allow temporal shifting of Delta exports during periods critical to fisheries. These potentially required volumes will depend on the amount of water available for these purposes on the transfer market.

Storage Ranges

The following preliminary ranges of storage are proposed for the Bay-Delta Program Phase 2 optimized alternatives. As noted, additional refinement may be possible based on further consideration of operational rules that might be associated with any optimized alternative. Final implementation of any of this storage will depend on Phase 3 (or later) site-specific environmental documentation, and more detailed evaluation of costs and benefits.

Range of Storage for Bay-Delta Program Optimized Alternatives

Storage Component	Minimum (TAF)	Maximum (TAF)
Sacramento Valley Groundwater Storage	0	250
San Joaquin Valley Groundwater Storage	0	500
Sacramento River Basin Surface Storage	0 ¹	3,000 ²
San Joaquin River Basin Surface Storage	0 ¹	500 ²
In-Delta Storage	0 ¹	200 ²
South of Delta Off-Aqueduct Storage	0 ¹	2,000 ²

Notes:

¹Minimum storage to be increased by the quantity of new storage necessary to achieve ERPP flow targets and temporal shifting of Delta exports from times most sensitive to fisheries.

²Maximum storage to be decreased based on reevaluation of potential benefits given Delta operational constraints associated with Delta improvements for each alternative.

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