

3/10/97 DRAFT

**Comprehensive Management of Water Quality, Water Supply,  
and Instream Flows in the San Joaquin River System  
As Proposed by Alex Hildebrand and Collaborators**

Introduction

The objective of this plan is to pursue methods of watershed management in the San Joaquin River System that take advantage of the interplay of management opportunities in different locations and for different interests such that the overall plan is a win-win for all interests. The plan involves multiple use and reuse of water so that water quality and needed streamflows can be provided without reallocations of water. This is accomplished by recirculating water via the Delta Mendota Canal, managing the time and quality of drainage flows to the river through Salt and Mud Sloughs, and using four operable, permanent South Delta barriers to protect salmon smolts and limit the recapture and re-export of river salt load by the Federal export pumps.

Benefits

Benefits of the plan include (a) assisting the provision of streamflows for fish at Vernalis; (b) improving instream water quality control along the mainstem of the river from the Merced River to Vernalis; (c) improving flow downstream of the Merced to reduce residence time and temperature for salmon smolts; (d) reducing the need for releases from New Melones for water quality control so that more Stanislaus water is available for fishery and other needs; (e) reducing the need for acquisition of water for fish flows; (f) reducing the salt load and salinity in the Delta Mendota Canal; (g) improving water quality for beneficial users on the San Joaquin River; (h) reducing the concentration of selenium in the river from March 1 through May 15; (i) increasing dissolved oxygen for fish upstream of Stockton; and (j) reducing salinity during spring months at the Contra Costa Water District intake. No other plan has been proposed that provides these combined benefits, although the water quality benefits would be provided by a valley drain.

The plan does not require any substantial new facilities for partial implementation but some drainage control facilities would make it more effective. It is proposed that it first be implemented on a trial basis to the degree that it can be done without any significant new facilities. The plan can then be refined by stages for optimum benefit.

## Outline of Plan

Basic features of the plan are as follows:

(1) Increased San Joaquin River flow through the recirculation of water released from the Delta Mendota Canal

The plan assists flows needed along the main stem of the river by releasing water from the DMC to the river through the Newman wasteway and then recapturing that water for reexport. Recapture will be done concurrently, except that water may be borrowed from San Luis Reservoir to prime the system at the beginning of the period of recycling and returned at the end of the period. The water released in the tributaries for fish could be limited to what is needed for fish habitat in each tributary and the balance needed at Vernalis could be provided by recirculation whenever and to the extent reasonably feasible rather than by water taken from other needs. Export pump capacity is available in many years at the time of greatest need, i.e. from April 15 to May 15.

A key to the success of the recirculation component of the plan is the ability to increase pumping by the amount of water being released from the DMC. If recirculation results in any water loss it is proposed to be replenished by using a portion of the savings that the plan provides in the need for New Melones "water quality" releases.

(2) Limited potential for providing streamflow by acquisition

Unmitigated third party and downstream impacts must be avoided if anadromous fish water is provided by "acquisition" from willing sellers when recirculation is not feasible. In most years the water available in the San Joaquin River System is overcommitted. Increases in fish flows in or from tributaries, therefore, could result in decreased summer stream flow unless the flow derives from reduction in consumed water, from new yield, or from better multiple use or reuse of water, or from DMC releases. These summer flows are important for riparian diverters, for water quality, for consumptive public trust needs, and for resident fish and wildlife.

For purposes of this plan, flows in the Tuolumne and Merced Rivers would meet the appropriate FERC license provisions and/or the provisions in the Davis-Grunsky

agreement. The operations criteria for New Melones Dam would be to meet (1) water rights obligations including those commitments to South San Joaquin Irrigation District and Oakdale Irrigation District, (2) instream fishery flow needs of the Stanislaus River, (3) water quality releases to meet the Vernalis salinity standard, and (4) Reclamation contracts. Water acquisitions by Reclamation in the San Joaquin River are assumed to comply with Reclamation's commitment that acquisitions will not be allowed to cause or exacerbate either violations of the Vernalis salinity standard or deficiencies in the summer flow at Vernalis needed for South Delta agriculture.

(3) Managing drainage flows

Manage the time of entry of agricultural subsurface drainage and wetland discharges to the River via Mud and Salt Sloughs so as to reduce the amount of water discharged and/or improve the quality of said discharges particularly during March 1 and April 15. Any water retained in wetland areas to meet this objective would then be released during April 15 and May 15 when there is ample dilution by fish releases from tributaries and from the DMC. Some facilities are expected to be needed in the wetlands to facilitate the management of discharges. The agricultural drainers are now able and willing to provide a substantial degree of control.

(4) South Delta flow control barriers

Installation of the proposed operable flow control barriers in the South Delta should be expedited.

The three tidal barriers must be operable at all times except during high wet-year flows. Operations during the fall would be aimed toward improving the dissolved oxygen levels. The operations during the spring would be aimed at enhancing the survival of emigrating San Joaquin River smolts. The gates would remain fully raised during the non-operational times of the year.

The fish barrier at the head of Old River will further enhance the protection of anadromous fish. It should be designed to allow a controlled amount of water through the barrier as needed to mitigate impacts of that barrier on downstream channels or endangered species.

Other benefits include: maintenance of an adequate water depth for agricultural diversion; maintenance of

circulation for in-channel water quality control; and reduction of salinity intake at the export pumps.

(5) Salinity at Contra Costa intake.

The overall plan will not increase and is expected to decrease annual salinity of water pumped at the Contra Costa Water District's intake. The barriers which are essential for other reasons may cause some increase of salinity in the summer, but the drainage control will lower salinity in the spring and the district does not pump during April 15 to May 15 when the diluted drainage would be flushed out.

Relationship of the Plan with Existing Standards, Regulations, and Operations

None of the components of the plan appear to conflict with either the December 1994 Accord or the current SWRCB Control Plan. They do conflict with the desire by fishery interests to allow only a portion of the Vernalis flow to be exported between April 15 and May 15. All of the water released from the DMC during this period must be subject to recapture. The limitation on pumping Vernalis water that is proposed by fishery interests is based on data taken without the barriers in place and does not, therefore, appear to be supported by relevant experience. Furthermore, many of us do not believe that enough purchased water to meet the proposed Vernalis flows can be obtained in the critical years when they are most needed. It does not appear, therefore, that the desired flows will be consistently provided. Recirculation can assist in meeting the desired flows.

Assumptions and Modelling for Trial Implementation of Plan

Preliminary modelling of the physical feasibility of the proposed recirculation has been done by the San Luis and Delta-Mendota Water Authority (Tom Boardman). The Department of Water Resources (Francis Chung) plans to provide further modelling to demonstrate how the trial would function.

Francis will collaborate with Tom and with Dennis Falaschi (Panoche Water District), and Les Grober (Regional Board staff) and others regarding the degree of drainage management and the volume and salinity of that controlled drainage that can be achieved without new facilities.

The assumptions regarding spring flows from the tributaries will be the new FERC release schedules from the Tuolumne, whatever Merced flows are formally committed, and 1500 cfs from the Stanislaus from April 15 to May 15. Stanislaus and Vernalis flows from March 1 to April 15 are assumed to be per historical flows for different year types as modified by new tributary flow

commitments and by the effect of those commitments and the effect of drainage control on the need for New Melones "water quality" releases. April 15 to May 15 Vernalis flows will be per the 1995 Control Plan. The Vernalis salinity standard is to be met at all times.

Existing Delta and river system models will be used. Vernalis flow versus salinity relationships in the models will be used and the results then corrected for the effect of drainage control.

The DMC release and the drainage releases must be managed so as to assure that river water quality downstream of the Merced River is as good as it would have been in the absence of the plan during the controlled drainage releases from April 15 to May 15.

When this modelling is completed it will be provided to the SWRCB and to all parties whose concurrence is needed to implement the trial of the program.

#### Summary

In summary, the above mentioned plan provides the framework for a plan that when combined with other proposals will constitute a comprehensive plan to meet the water quality objectives in the 1995 Water Quality Control Plan and to meet whatever flow objectives prove to be justified. This plan proposes to achieve this by several methods listed below:

- (1) Recirculation of Delta-Mendota Canal water during the spring pulse flow period (April 15 to May 15) to assist in meeting the Vernalis flow objective. This is only proposed to be accomplished if there is no net loss to any of the westside water users.
- (2) Managing the timing and amount of subsurface drainage water that enters the San Joaquin River from March 1 through April 15, then releasing the drainage flows during the pulse flow period.
- (3) Managing the timing or quality of wetland discharges to the San Joaquin River from March 1 through April 15, then releasing any water retained to meet the above objectives during the pulse flow period.
- (4) The installation of four operable South Delta barriers. A barrier at the head of Old River for the protection of San Joaquin Chinook salmon smolts, and three tidal barriers to mitigate the impact of the fish barrier and the export pumps on in-channel water supply in the South Delta and to reduce the salinity of water in the Delta Mendota Canal.

- (5) Financing for the plan could be obtained from the CVPIA Restoration Fund or other sources available to the Bureau of Reclamation.