

**Appendix B  
PLANNING AND OPERATION COORDINATION  
FOR THE  
VERNALIS ADAPTIVE MANAGEMENT PLAN**

Successful implementation of the Vernalis Adaptive Management Plan (VAMP) will require communication and coordination among the several operating agencies that manage flows and facilities in the San Joaquin River Basin and the Bay Delta. Also, significant coordination will be required between project operators and fishery resource managers to provide the conditions that will produce the needed information to be provided by VAMP while at the same time protect the naturally produced salmon of the San Joaquin River Basin.

This document provides the framework, and certain specific detail, of the communications, protocols and procedures to be used to provide operations for the conduct of VAMP. This framework focusses on aspects of basin operations that provide flows to the Bay Delta, and the directly linked operation of the fishery barrier at the head of Old River and exports at the Central Valley Project (CVP) and State Water Project (SWP) delta facilities. The aspects of VAMP that address protocols for the marking, release and recapture of salmon will be described in a separate document. These communications, protocols and procedures are provisional and may be modified by the San Joaquin River Technical Committee (SJRTC) pursuant to Section 11 of the San Joaquin River Agreement.

**Hydrology Group of the San Joaquin River Technical Committee**

The Hydrology Group of the San Joaquin River Technical Committee (SJRTC) is charged with the responsibility to develop and exchange information concerning forecasted hydrologic conditions, execute the protocols that establish the Test Flow Target and determine San Joaquin River Group (SJRG) Supplemental Water, establish an operations plan for the coordination of flows, and provide a post-analysis and report of operations. The Hydrology Group will also be required to coordinate with other technical groups to develop an efficient operation best fitting the needs of all interests.

The makeup of the Hydrology Group will be determined by the SJRTC. All signatories to the San Joaquin River Agreement will have the right to participate on an equal basis in the Hydrology Group. The SJRTC may also elect to add non-signatory members, pursuant to Section 11.1 of the San Joaquin Agreement. However, in order to function effectively, the Hydrology Group requires participation from at least the water project operators which will be coordinating their respective operations to provide flows and test conditions for VAMP. Those agencies and their initial representatives to the Hydrology Group are as follows:

<b>Agency</b>	<b>Operator Contact</b>
United States Bureau of Reclamation (USBR)	John Burke
California Department of Water Resources	Jim Spence
San Joaquin River Group (SJRG)	Mike Archer
Modesto Irrigation District	Walt Ward
Turlock Irrigation District	Wes Monier
Merced Irrigation District	Ted Selb
Oakdale Irrigation District	Steve Felte
South San Joaquin Irrigation District	Steve Felte
Exchange Contractors	Steve Chedester

John Burke from the USBR and Mike Archer, representing the SJRG, will be Lead Co-coordinators.

The Hydrology Group will meet, confer and report as necessary to carry-out their duties and responsibilities as defined by the procedures described hereafter. The SJRTC will ratify outputs from the Hydrology Group or, at its option, delegate authority to the Hydrology Group to make needed determinations on its own.

**Forecasting**

No later than February 10, the Hydrology Group will develop a preliminary basin-wide Forecast Report of San Joaquin River operations (without the effects of VAMP) for the February through June period. The format of the Forecast Report will be consistent with Attachment A. Forecasts will be provided for at least 90% and 50% probability of exceedence hydrologic runoff and water demand conditions. DWR runoff forecasts will be used as the basis of unimpaired runoff in the tributaries unless otherwise agreed. Each of the Hydrology Group participants will be responsible for providing the USBR and SJRG Lead Co-coordinators with either reservoir operations plans or the information necessary to develop the appropriate reservoir operations plans for each affected tributary. The Hydrology Group will be responsible for assessing information concerning accretions and depletions for the San Joaquin River and its tributaries, and for acquiring information regarding the planned operations of others affecting San Joaquin River flows to the Bay Delta. The Forecast Report will be provided to the CALFED Operations Group, Biology Group, and local tributary groups.

The USBR and the SJRG Lead Co-coordinators will be responsible for the tracking and periodic updating of forecasted/actual hydrologic conditions, initially on a bi-weekly frequency and later on a weekly basis as the Test Period approaches. Significant changes in hydrologic conditions will trigger the development of revised forecast reports. At a minimum, a revised Forecast Report will be provided the first week of March, mid-March, the first week of April and each week thereafter until the Operations Plan is employed.

After the conclusion of the pulse flows, the Hydrology Group will continue to share and update operations forecast information on a monthly basis so that the best available forecasts of San Joaquin River flows can be included in the CVP/SWP operations plans. The group may decide to suspend this routine coordination during periods when operations plans have become fixed or predictable.

**Test Flow Target**

The flow target for the 31-day Test Period will be established as the Test Flow Target immediately greater (Single-step Criteria) than the average flow that is forecasted to occur during the Test Period at Vernalis, unless increased by the Double-step Criteria. The Test Flow Target criteria are described below:

Single-step Criteria. Unless increased by the Double-step Criteria, the flow target will be the Test Flow Target immediately greater than the average flow that is forecasted to occur during the Test Period at Vernalis, consistent with the following table:

<b>Forecasted Average Flow at Vernalis (cfs)</b>	<b>Test Flow Target (cfs)</b>
0 - 1,999	2,000
2,000 - 3,199	3,200
3,200 - 4,449	4,450
4,450 - 5,699	5,700
5,700 - 6,999	7,000
7,000 or greater	Existing Flow

When the flow exceeds 7,000 cfs, the SJRG will exert its best efforts to maintain a stable flow rate during the Test Period to the extent reasonably possible. When the flow is 2,000 cfs or less the USBR shall operate pursuant to Sections 5.5 and 6.4 of the San Joaquin River Agreement.

Double-step Criteria. In any year when the sum of the current year's forecasted and previous year's 60-20-20 Indicators is seven (7) or greater, the flow target for the Test Period will equal the Test Flow Target one level higher than that established by the Single-step Criteria. The 60-20-20 Indicator for the VAMP is as follows, and is related to the San Joaquin Valley Water Year Hydrologic Classification as described in 95-1WR (1995 Water Quality Control Plan). The 90% probability of exceedence forecast will be used to calculate the current year's San Joaquin Valley Water Year Hydrologic Classification.

<b>San Joaquin Valley Water Year Hydrologic Classification</b>	<b>60-20-20 Indicator</b>
Wet	5
Above Normal	4
Below Normal	3
Dry	2
Critical	1

**Test Period**

Although focussed on test protocols that measure the survival of tagged hatchery salmon smolt, the VAMP creates an opportunity to provide pulse flow conditions for smolts naturally spawned within the San Joaquin River Basin. The Biology Group will heavily influence the scheduling of the Test Period, initially constructed as a continuous 31-day period elapsing sometime during April and May. It is important for the VAMP to coincide the Test Period with the peak period of time when naturally spawned smolts are migrating out of the San Joaquin River Basin. However, it is recognized that trade-offs in the scheduling of the VAMP will be required to recognize the practicalities of hatchery operations, monitoring activities, barrier operation, and flow and export operational constraints.

The Biology Group will provide its initial estimate of the preferred period of the VAMP beginning in February, coincident with the Hydrology Group's Forecast Report, and provide an updated estimate coincident with each revised Forecast Report. Coincident with the mid-March Forecast Report, the Hydrology Group and the Biology Group will jointly identify the Tentative Test Period. This Tentative Test Period will be used in subsequent planning efforts, and will be modified only as a result of significant changed circumstances.

**SJRG Supplemental Water Determination**

Supplemental Water to be provided by the SJRG for the VAMP is the amount of water needed to achieve the Test Flow Target or 110,000 acre-feet, whichever is less. Additionally, during years when the sum of the current year's and the previous two years' 60-20-20 Indicators is four (4) or less, the SJRG will not be required to provide Supplemental Water above the Existing Flow at Vernalis.

The determination of Forecasted Supplemental Water will be performed by the Hydrology Group coincident with each Forecast Report. Prior to the mid-March Forecast Report, it will be assumed that the Test Period will occur mid-April through mid-May. The estimate of Forecasted Supplemental Water will be consistent with

Attachment B, and will be based on the average flow that is forecasted to occur during the Test Period at Vernalis and the coinciding Test Flow Target.

Adjustment for Melones Operation. For the determination of Supplemental Water, Existing Flow at Vernalis will be mathematically adjusted to account for any differences between the scheduled [actual] river release below Goodwin and the river release assumed under the Interim Operation Plan. Supplemental Water provided by the SJRG will be determined as if Melones is operated to provide the river release assumed under the Interim Operation Plan. Deviation from the assumed river release during the Test Period will also account for the carry-over affect of varying from the Interim Operation Plan during other periods of the year.

Adjustment for Water Purchase Programs. The determination of the amount of Supplemental Water to be provided by SJRG will take into account the existence of water at Vernalis that occurs as the result of other sales or transfers by the SJRG, or by other flow augmentation programs provided by the USBR. Supplemental Water provided by the SJRG will be determined as if flow at Vernalis is absent of these actions.

### **Operations Plan**

Beginning with the mid-March Forecast Report, the Hydrology Group will develop the Operations Plan to provide the VAMP flows. The Operations Plan will be revised coincident with changes in the Forecast Report. The Operations Plan will provide a daily plan of operation for April and May. The format of the Operations Plan will be consistent with Attachment C.

The SJRG will provide to the Hydrology Group the information necessary to develop the Vernalis flow component of the Operations Plan. Such information will include the locations from which Supplemental Water will be released. The Hydrology Group will integrate the Supplemental Water with the other forecasted hydrology and water management programs of the basin into a forecast of VAMP Vernalis flow conditions.

The Hydrology Group will also coordinate with the CALFED Operations Group and appropriate agencies to identify the plan for barrier installation/operation and VAMP export operations.

### **Implementation Procedure**

The SJRG members and USBR will carry-out the Operations Plan using best efforts to make Control Point releases match the Operations Plan forecast of releases. The USBR and the SJRG Lead Co-coordinators will track actual operations and hydrologic conditions during the Test Period and disseminate such information along with a projection of conditions anticipated for the remainder of the Test Period. The Hydrology Group will confer weekly, beginning late March, to review schedules. Storms, flood control or other unforeseen circumstances may require more frequent schedule changes. In order to maintain the intent of a stable flow, an effort will be made to keep flows within a specified range above and below the target flows.

### **Post-Analysis and Report**

The Hydrology Group will provide an Operations Report each year following the Test Period. The format of the Operations Report will be consistent with Attachment D. The purpose of the Operations Report is to provide a summary of the hydrologic conditions that occurred during the Test Period, and to identify issues that occurred during that year concerning the planning and operation of the VAMP. The Operations Report will also provide alternatives to resolve those issues prior to the next year of the VAMP.

### **Calibration of Flow Measuring Points**

The agencies will consult with USGS prior to the pulse flows regarding planned flow measurement of river sections for the purpose of adjustment to rating tables for Vernalis and upstream control points. Ideally, ratings would be checked just before the beginning of the 31-day period.

# Attachment D

## Operations Report

Introduction

Flow Augmentation Programs

SJRG Supplemental Water  
Other Programs

Report of Hydrology

Issues

Alternatives/Recommendations