

PART II. COMMENTS ON THE DRAFT ENVIRONMENTAL REPORT

CHAPTER I. INTRODUCTION

B. Background

Comment: [Pages I-4 and I-5] The SWP and the CVP water rights are subject to the area of origin statutes, and diversions for export by these projects are restricted until the needs in the watershed, including protections for beneficial uses in the Bay-Delta Estuary, are met. (SJTA-2)

Response: The SWRCB recognizes these statutes and will take them into consideration when it conducts the water rights phase of the Bay-Delta proceedings.

Comment: [Page I-5] The draft environmental report acknowledges the area of origin statutes at page I-5, but the report also says the goal of the project is to: "Minimize the impact of new standards on water supply reliability throughout the Bay-Delta watershed and export areas." (SEWD-2)

Response: The SWRCB recognizes the existence of the area of origin statutes and will consider them when it conducts the adjudicatory water rights phase to implement the objectives.

Comment: [Page I-7, 1st full para., first sentence] DWR has contracts with 29 public agencies, not 30 agencies. (DWR-2)

Response: The text is revised accordingly.

Comment: [Page I-7, 2nd full para.] The draft environmental report states that half of the SWP supply is excess Delta flows. Excess flows that were previously available to meet the fish and wildlife needs of the Estuary must first be used to meet the beneficial uses in the Estuary and in the watershed before being exported for use outside the watershed. (SJTA-2)

Response: This water rights issue will be considered in the water rights phase of these proceedings.

Comment: [Page I-8] Water Right Decision 990 (D-990) recognizes the importance of the area of origin principles. The Delta-Mendota Canal and Contra Costa Canal permits prohibit exports until in-basin demands are satisfied, and D-990 reserved jurisdiction to require the bypass of natural flow or releases from storage to meet CVP responsibility for Bay-Delta needs. The SWRCB should continue to require the SWP and the CVP to mitigate their impacts and should hold the export projects solely responsible to provide water for salinity control and to meet their own export uses and carriage water requirements. (SJTA-2)

Response: This is a water rights issue which may be raised and considered in the water rights phase of these proceedings.

Comment: [Page I-10, 3rd full para.] To provide more complete information, we suggest that a cross reference be added to the end of the paragraph as follows: "D-1485 and the 1978 Delta Plan are discussed in greater detail on pages III-1 -III-10." (JCWU-1)

Response: The text is revised to reflect the comment.

Comment: [Page I-11, para. 4, 1st sentence] Contrary to assertions made in the draft plan and the accompanying draft environmental report, the joint proposal by the California Urban Water Agencies (CUWA) and some agricultural interests did not represent a consensus by all agricultural interests. In fact, most of the agricultural water agencies in the State were not present during, nor were they asked to attend, any of the deliberations on the proposal. (SJTA-1)

Response: The draft plan does not make this assertion. The draft environmental report has been clarified to state that the urban and agricultural interests that signed the Principles for Agreement represented principally urban and agricultural water exporters from the Delta.

Comment: [Pages I-11 and I-12] The draft environmental report states that it complies with CEQA requirements for analyzing the environmental effects of the proposed actions, but the report does not examine the effects on wildlife and agriculture during periods when fish flows are not required. During these periods, the USBR may have used up all the water allocated to other uses. This is justified by stating the plan isn't implemented for another three years, but the USBR is now implementing the flow objectives. (SDWA-2)

Response: Modeling analyses which predict the effect of the plan on water quality in the Delta throughout the year have been incorporated into Chapter VIII of the environmental report. This modeling effort is described in more detail in the response to comments on Chapter VIII.

The plan does not require the USBR to meet the flow objectives this year. To the extent that the USBR meets new objectives that are in the plan, it is doing so either voluntarily or to comply with ESA requirements.

Comment: [Page I-12] Add a paragraph to point out the adequacy of the environmental report to serve as an environmental impact report (EIR). (JCWU-1, DWR-1)

Response: The recommended paragraph, with minor changes, has been added after the third full paragraph, to point out the adequacy of the environmental report to serve as an EIR.

Comment: [Page I-12, final paragraph] Add a sentence to more clearly reflect the intended use of the draft environmental report with respect to possible modification of D-1485. (JCWU-1)

Response: A sentence similar to the recommended sentence has been added.

CHAPTER II. PROJECT DESCRIPTION

Comment: The draft environmental report does not appear to clearly identify the scope of actions under analysis. It is unclear whether the intended scope of the draft report is an analysis of the three year Principles for Agreement or of a longer term plan. For example, in Chapter VII the draft environmental report identifies a modeling assumption that "if there is insufficient water in New Melones to meet all of the requirements, the model obtains additional water from the San Joaquin River upstream of the confluence with the Stanislaus River." This creates at least two conflicts. First, there is no provision in the Principles for Agreement for calling on upstream water releases beyond that to be supplied by New Melones. Second, the reasonable and prudent alternatives in the biological opinion for Delta smelt say that if there is insufficient water in New Melones Reservoir to meet the requirements of the biological opinion the standard may be relaxed. (SFPUC-1)

Response: The draft environmental report analyzes the effect of implementation of the draft plan. The draft plan is consistent with the Principles for Agreement, but it is not exactly the same as the principles. If adopted, the objectives in the plan will remain in effect until amended by the SWRCB. For modeling purposes, the SWRCB staff requested the DWR to assume that San Joaquin River flow requirements would be met by releases from New Melones Reservoir. If there was insufficient water to meet the requirements from New Melones, the DWR was requested to identify the additional water required. This request was made in order to identify the total amount of water needed to meet the objectives. Once the objectives are adopted, the SWRCB intends to use its regulatory authorities to ensure that the objectives are met.

CHAPTER III. EXISTING REGULATORY CONDITIONS

Comment: [Page III-24 to III-25] The SWRCB should not adopt the inference in the draft environmental report that biological justification exists linking San Joaquin River flows to Delta smelt abundance. To date, there is insufficient evidence to validate the reasonable and prudent alternatives contained in the biological opinion for Delta smelt, the effectiveness of transport flows, or the necessity of San Joaquin River flows when the Old River barrier is installed. The San Joaquin standards are to be reviewed over the next three years to evaluate the scientific support for these measures. (SFPUC-1)

Response: The purpose of this chapter is to document existing regulatory conditions. This section describes the requirements in the biological opinion for Delta smelt, which includes a

flow requirement on the San Joaquin River. The SWRCB is not adopting any inferences by stating the biological opinion requirements.

CHAPTER IV. ENVIRONMENTAL SETTING

C. Central Valley Basin

Comment: [Page IV-5, last sentence] The description of the aquifer underlying the Central Valley states that "Useable storage capacity in a depth zone of 200 feet below ground surface has been estimated as between 80 and 93 MAF in the San Joaquin River Basin..." The SWRCB should understand that there are literally thousands of domestic wells drilled to depths of less than 100 feet. In order to estimate the cost of emptying and filling this underground space, the SWRCB will have to analyze the cost of deepening all domestic wells to more than 200 feet. In addition, there is already an overdraft of 209 TAF on average in the San Joaquin Basin. This plan will only make the overdraft worse. (SJTA-2)

Response: The SWRCB understands that wells are often drilled to shallow depths and that substantial expense can be incurred when declining groundwater levels require wells to be deepened. The statements made in this section are factual descriptions of the groundwater system in the area and are not meant to imply that the water supply can be exploited without expense.

The overdraft problem cited by the commenter is discussed in Chapter VIII of the environmental report.

Comment: Average runoff from the Sacramento Basin is estimated at 21.3 MAF in the draft environmental report. No similar number is given for the San Joaquin Basin on page IV-24. (SJTA-2)

Response: Average runoff from the Sacramento Basin has been modified; the correct runoff amount is 22.4 MAF. Average runoff from the San Joaquin Basin is 7.93 MAF; this information has been incorporated into the text.

Comment: [IV-24, para. 5] The sentence, "At times, no flows may also occur below diversion points on the larger streams", is only correct for portions of the San Joaquin River upstream of the mouth of the Merced River. It is not true for the Merced, Tuolumne, or Stanislaus rivers, or the mainstem San Joaquin River below the mouth of the Merced River. (SJTA-2) (A similar comment referring only to flows on the Tuolumne River was made by SFPUC-2.)

Response: The statement is correctly extracted from the reference DWR 1993a in Chapter IV. However, the reference is not completely clear on this issue, and the sentence has been deleted.

Comment: [Page IV-25, Table IV-2] San Francisco controls 740 TAF of the storage in New Don Pedro Reservoir, consisting of 570 TAF plus half of any encroachment into the 340 TAF of flood control space. The 740 TAF of New Don Pedro capacity should be allocated to San Francisco. Also, Buchanan Dam on the Fresno River should be included in the list of major reservoirs. (SJTA-2)

Response: The table identifies the major reservoirs in the San Joaquin River basin and their principal owners. Turlock Irrigation District and Modesto Irrigation District are correctly identified as the owners of New Don Pedro. The table is not intended to identify all of the entities that have some measure of control of each of the major reservoirs.

For the purposes of this table, major reservoirs are defined as reservoirs with a capacity in excess of 100 TAF. Buchanan Dam, with a capacity of 90 TAF, does not fit this definition.

Comment: [IV-25, para. 1] Please provide a reference for the statement that dissolved oxygen fluctuations due to algal concentrations and partially treated M&I wastewater have led to fish kills on the Stanislaus, Tuolumne, and San Joaquin rivers. The cause of these fish kills is not the responsibility of the upstream water projects. These problems should be addressed by the SWRCB and the Central Valley RWQCB through their authority to regulate wastewater discharges. (SJTA-2)

Response: The first paragraph in chapter IV states that, unless otherwise cited, the information presented in this chapter is extracted from two DWR sources. This statement is extracted from the reference DWR 1993a.

The issue of responsibility for fish kills is not a subject of this proceeding.

Comment: [IV-26, 5th full para.] Prior to 1977, the Tuolumne River water quality was heavily influenced by abandoned gas wells that discharged highly saline water into the river. As a result, the Tuolumne River had higher salinity than the other tributaries. The salinity of the Tuolumne River water decreased significantly after the wells were capped in 1977, and water quality has also improved due to higher flows provided by New Don Pedro Reservoir for fishery purposes, particularly in the fall months. (SJTA-2)

Response: The paragraph in question states that the Tuolumne River generally has good quality through much of the year. However, as stated, the abandoned wells and agricultural return flows still result in water quality conditions that are occasionally less than optimum.

Comment: The entire discussion is limited to the land use and economy of the Delta export agricultural areas. This section should be revised to include land use and economy of the eastside San Joaquin Valley. (SJTA-2)

Response: The section has been revised to include a discussion of the land use and economy of the eastside San Joaquin Valley.

Comment: The entire discussion is limited to recreation at the CVP and SWP facilities. There is no mention of the recreational opportunities elsewhere in the basin, including reservoir recreation at New Melones, New Don Pedro, New Exchequer and other reservoirs, fishing along the basin's rivers and streams, and boating and whitewater rafting on the major tributaries. (SJTA-2)

Response: The text has been revised to include other recreational opportunities.

Comment: [Page IV-27, para. 1] The draft environmental report should correctly note that groundwater will continue to be a source for municipal and industrial supplies as well. Most importantly, however, the draft report should note that the interim plan to provide all San Joaquin River water quality flows from New Melones will effectively eliminate the ability of the water agencies in the Stockton area to implement artificial recharge and conjunctive use programs as planned for that source for the past 25 years. (SEWD-2)

Response: The text has been modified to include the fact that groundwater will continue to be a source for municipal and industrial supplies. In regard to the second part of the comment, the SWRCB is not adopting an interim plan. The Delta smelt biological opinion requires the USBR to meet flow requirements in the San Joaquin River. These flow requirements are the same as the flow objectives in the plan. The SWRCB will implement its flow objectives through a water right decision, at which time it will consider the issue of allocation of responsibility among the water right holders in the Central Valley.

D. Sacramento-San Joaquin Delta (and Central Sierra Area)

Comment: [Page IV-36, 4th full para.] The text incorrectly states that the CCWD contract with the USBR is for a supply level of 145 TAF per year. The correct supply level is 195 TAF per year. Also, the text should be modified to provide a current description of the status of the Los Vaqueros project. (JCWU-1)

Response: The contract amount has been corrected, and the description of the Los Vaqueros project has been updated.

Comment: [Page IV-37, 1st full para.] The text in this paragraph should be revised to state that the CCWD provides the municipal and industrial water needs of approximately 400,000 county residents, not 300,000 as stated. (JCWU-1)

Response: The text has been revised.

Comment: The section on surface water quality should include a discussion of sewage discharges from public and industrial wastewater treatment plants. While the increased use of secondary treatment facilities has reduced the impact of these discharges on surface water quality in recent years, there should be some recognition of the potential impact of reduced

nutrient loadings to the Delta, including possible reductions in zooplankton and phytoplankton production. (JCWU-1).

Response: A discussion of this issue has been added to the section.

Comment: [Page IV-39, last para., 3rd sentence] The draft environmental report states: "During periods of reverse flow, bromides from the ocean intermix with Delta water at the western edge of Sherman Island." In fact, low outflow and tidal mixing cause salinity intrusion to Sherman Island regardless of whether the flows are reversed. We, therefore, recommend that the quoted statement be substituted with the following: "During periods of low Delta outflow, tidal mixing of salts from the ocean (including bromides) extends farther into the Delta, increasing the bromide concentrations at municipal drinking water intakes." (JCWU-1).

Response: The text is revised to reflect the comment.

Comment: [Pages IV-40 and IV-46] These sections are intended to provide an overview of fish and wildlife supported by the Delta, the San Francisco Bay system, and surrounding lands. The discussion would be more complete if it included reference to introduced or exotic species in the system. (JCWU-1)

Response: A discussion of introduced species is provided in Chapter V.

Comment: [Page IV-41, para. 4] The statement that biological productivity is highest in the entrapment zone is wrong. Biological production, or biomass, may be higher in the entrapment zone due solely to the entrapment process, but productivity (rate of growth) is not higher in the entrapment zone when compared to outside of the zone for any species measured. (DWR-2)

Response: The statement has been corrected.

E. Suisun Marsh

Comment: [Page IV-42, para. 5] The last sentence in this paragraph describes the importance of tidal wetlands. The description should be modified to note that the majority of Suisun Marsh consists of managed, diked wetlands. (DWR-2).

Response: The description is modified.

Comment: [Page IV-42, para. 6] The heading of this paragraph should be changed from "Surface Water Hydrology" to "Land Use". (DWR-2)

Response: The heading is changed.

Comment: [Page IV-43, 1st partial para.] The last sentence of this paragraph states that "[T]he DFG owns and manages 14,000 acres, while another 1,400 acres on the channel islands is owned by the federal government". This sentence should be changed to the following: "The DFG owns and manages 14,700 acres. The Solano County Farmlands and Open Space Foundation owns 1,050 acres of tidal wetlands, 940 acres of Potrero Hills Uplands, and a 78 acre diked managed wetland. The U.S. Navy administers 1,400 acres of tidal wetlands on the channel islands of Suisun Bay." (DWR-2)

Response: The text has been revised accordingly.

Comment: [Page IV-43, 1st full para.] The discussion in this paragraph is limited to undiked tidal marshes. The DWR recommends that the following language be inserted. "Within the diked managed wetlands of the Suisun Marsh, water management and the resulting controlled wetland hydroperiod has been shown to have the significant effect on vegetation type used by several sensitive fish including Delta smelt, longfin smelt, chinook salmon, and splittail." (DWR-2)

Response: The suggested language is inserted.

Comment: [Page IV-43, 5th full para.] The discussion of threatened and endangered species in this section is incomplete. The following, more complete discussion should be substituted. "Resident breeding populations of two endangered species (the salt marsh harvest mouse and the California clapper rail), one threatened species (the California black rail), and two candidate species for federal listing (the Suisun song sparrow and Suisun ornate shrew) have been documented in Suisun Marsh. Two State-listed plant species (Mason's lilaeopsis and Soft bird's beak) occur in Suisun Marsh in addition to three federal candidate species (Suisun Slough thistle, Suisun aster, and Delta tule pea)." (DWR-2)

Response: The more complete discussion is added.

CHAPTER V. AQUATIC RESOURCES

A. General Causes of Decline

Comment: Section A of Chapter V is misleading because the decline of aquatic resources is actually caused by three human induced factors: water development, land use practices, and harvesting. The section should be revised by reducing the eight factors to these three factors. (BISF-3)

Response: The most significant factors are the human-induced factors. These actually include all of the factors except natural hydrologic variability and oceanic conditions. Of the human-induced factors, water development, land use practices, and harvesting of aquatic species are probably the most significant. Text has been added to this section to emphasize this point.

Comment: [Page V-1, last sentence] This sentence refers to an analysis of water year types for the period 1930-1992. Failure to address DWRSIM output (e.g. simulated D-1485 flow for years prior to 1930, including the 1928-1934 critical period and the 1924 critical year) may result in an incomplete analysis. This section should be revised to incorporate the full 71-year period of 1922 through 1992 used in the DWRSIM analysis. (It also should be noted that 1930-1992 is a 63 year hydrological period, not 62.) (JCWU-1)

Response: This section is not addressing DWRSIM output; it is simply a discussion of historical conditions. However, water year classifications are available for both the San Joaquin River and Sacramento River from 1922-1930 and are therefore included in the revised Table V-1.

Comment: [Page V-2, Table V-1] The SWRCB must keep differences between the two basins in mind and not make the same assumptions for both basins when it is determining allocation of basin responsibilities to the Bay-Delta Estuary. (SJTA-2)

Response: Comment noted. The SWRCB will consider specific hydrologic conditions when developing allocation responsibilities during the water rights proceeding.

Comment: [Page V-3, 1st partial para.] References to the driest and longest droughts are incorrect; they should not include 1986. (DWR -2)

Response: The sentence has been revised accordingly.

Comment: [Pages V-4 to V-6] This section generally provides a thorough overview of the upstream impacts on aquatic resources. It also may be appropriate, however, to acknowledge the potential impacts associated with the loss of nutrients and particulate organic carbon (POC) that may have occurred due to the blocking and impounding of upstream sources as a result of dam construction. (JCWU-1)

Response: This issue is addressed in sections A.2.e, A.4, A.5, and A.6 of Chapter V..

Comment: [Pages V-8 and V-81] The draft environmental report is replete with documentation of the harm to fish and wildlife caused by the poor quality of water in the lower San Joaquin River. The concern expressed in the report rings hollow. The SWRCB had the opportunity to correct this problem when the Central Valley RWQCB's basin plan was before it. CEQA prohibits the SWRCB from requiring other agencies to mitigate this problem when it has the direct ability to do so. (SEWD-2)

Response: The draft environmental report outlines a multi-pronged approach to the salinity problems in the lower San Joaquin River. The SWRCB's consideration of the regional water quality control plan was separate from this plan. CEQA does not require the SWRCB directly to provide mitigation which is outside its authority. Here, a number of agencies

have authorities and responsibilities with respect to the mitigation actions discussed in the environmental report and the plan.

Comment: [Page V-9, Figure V-2] While the SJTA acknowledge that water projects within the basin reduce the San Joaquin River spring runoff as compared to the calculated unimpaired flow, the figure is misleading in that fails to recognize that a significant portion of the water captured by upstream reservoirs during the spring peak is held for flood control purposes. The significant benefits provided by these flood control operations must be recognized by the SWRCB. Additionally, unlike the Sacramento River Basin, some 1.5 MAF of San Joaquin River basin water is exported out of the San Joaquin River basin via the Hetch Hetchy Aqueduct and the Friant-Kern Canal. Other in-basin users should not be responsible for the obligation of the water users who divert water out of the basin. (SJTA-2)

Response: The SWRCB recognizes the many benefits of water project operations. The purpose of the figure is to document the change in the San Joaquin River flow due to water project operations.

Obligations of water users to meet the objectives will be established during the water rights proceedings.

Comment: [Page V-8, para. 3] The second sentence needs to be clarified; it does not hold true for wet and above normal years. (DWR -2)

Response: Water development affects inflow to the Delta in all years; however, the effect is less pronounced in wetter years, and this clarification has been made.

Comment: [Page V-10, 4th full para.] The draft environmental report states that the CVP pumped 2.8 MAF and the SWP pumped 3 MAF in 1989. The CVP diversions should include CCWD deliveries and CVP water wheeled by the SWP. The SWP diversion totals should include those for the North Bay Aqueduct. (SARA-1)

Response: The value of 2.8 MAF represents the approximate diversion of water through the Tracy Pumping Plant to the Delta-Mendota Canal in 1989. Earlier in the same paragraph, it is mentioned that additional CVP pumping is conducted at the Contra Costa Canal, at an average of 130 TAF in 1987-1989 (134 TAF in 1989 according to the DWR's DAYFLOW Hydrologic Data). SWP diversion through the North Bay Aqueduct and wheeling of CVP water does not constitute a significant portion of the total project exports and are not crucial in this descriptive paragraph.

For clarification, a sentence is added to this section of the environmental report stating that the total CVP diversion from the Delta through both canals was over 3.0 MAF in 1989.

Comment: [Page V-11, 4th full para.] New information is available on the hydrodynamics of the entrapment zone. This section needs to be revised. (DWR-2, JCWU-1)

Response: The section on the entrapment zone (section A.2.d of Chapter V) has been revised to summarize the current theory on the entrapment zone. The "entrapment zone" may no longer be an appropriate term for the various forces that occur in the Estuary. Understanding of the low salinity habitat and hydrodynamics of the Estuary, and their influence on the estuarine biota, is continually evolving.

Comment: [Page V-13, 1st full paragraph, 1st sentence] For purposes of clarity, the words "approximate location of the upstream edge" should be substituted in this sentence for the word "location". (JCWU-1)

Response: The suggested phrase is added to the text (section V.A.2.d.). The sentence now reads: "An operational definition based on 2 parts per thousand salinity measured on the bottom (commonly known as X2) has been used to define the approximate location of the upstream edge of the entrapment zone in the Estuary."

Comment: [Page V-13, para. 5, last sentence] The statement that no agricultural diversions in the Delta are screened is incorrect. At least one and maybe six are screened. (DWR-2)

Response: The text is revised accordingly.

Comment: [Page V-16, last paragraph, 1st sentence] The use of the word "significant" to describe fish losses from agricultural diversion is ambiguous. "Significance" is a concept with both statistical connotations and implication for the analysis of environmental impacts under CEQA. Unless the context makes clear the sense intended, use of this term should be limited in the draft environmental report. (JCWU-1)

Response: The paragraph begins by stating that agricultural diversions may well account for significant fish losses in the Delta. The text then describes that the estimated impact of Delta agricultural diversions on fish could amount to several hundred million striped bass and tens of thousands of juvenile chinook salmon. The word "significant" can be used as an adjective meaning "important" or "of consequence", and that is the context in this case.

Comment: [Page V-18, 1st full para.] The August 1994 biological assessment provides additional information on the potential effects of the Pacific Gas and Electric Company's (PG&E) power generating facilities on Delta smelt and striped bass. (DWR-2)

Response: The paragraph is revised to incorporate the new information.

Comment: [Page V-18, 2nd full para.] It is important to note in the discussion of reverse flows that tidal flows dominate water movement in the Estuary. The increases in spring flows recommended for the San Joaquin River, while generally increasing the net seaward

movement of water in the Delta are not of a sufficient magnitude to overcome the tidal influences within the Delta. Once outmigrating salmon smolts have reached the Delta, their movement is affected primarily by the tidal flows, not by the San Joaquin River flows. (SJTA-2)

Response: The environmental report presents findings of other agencies on the status, trends, and causes of decline of various aquatic resources in the Estuary. The USFWS presented results of an analysis relating chinook smolt mortality to QWEST. The reference for this information, USFWS (1994), has been added to draft environmental report. Other parties, such as the CUWA (1994), DWR (1992a) and the DWR and USBR (1993) have published reports describing QWEST and/or reverse flows and the possible influence of the combined factors creating this phenomenon on entrainment of fish at the CVP and SWP pumping facilities. Whether QWEST or reverse flows affects smolt survival is an issue of ongoing discussion among the parties.

Comment: [Page V-18, last para., 1st sentence] The sentence states that: "Reverse flows reportedly disorient anadromous fish as they migrate either upstream or downstream following the salinity gradient". The discussion includes no reference to any particular study or report, however, that would support this statement. Either biologically credible authority should be cited here or the statement should be deleted. (JCWU-1)

Response: The reference to the 1992 USFWS publication "Measures to Improve the Protection of Chinook Salmon in the Sacramento/San Joaquin River Delta" was inadvertently omitted. The reference has been included after the second sentence of the paragraph.

Comment: [Pages V-19 to V-20, Figures V-7 and V-8] The figures illustrate that with high Delta flows and no CVP or SWP exports, there would be a continuous downstream flow pattern throughout the Delta with the exception of the tidal influence. This indicates that the projects should be responsible for all Bay-Delta standards necessary to maintain exports and protect Delta water quality. (SJTA-2)

Response: Water allocation responsibilities will be addressed in the water rights phase.

Comment: [Page V-21, para. 1] The reference to CUWA (1994) in support of the statement in this paragraph that "Reverse flows may also influence the number of fish lost via entrainment into the CVP and the SWP pumping stations" is misleading. The referenced report actually concluded that the DWR has found no statically significant relationships between reverse flow frequency and Delta smelt abundance indices. The paragraph should be revised to reflect this fact. (JCWU-1)

Response: The text has been modified as follows to address the comment: "CUWA (1994) reviewed the literature describing the effects of reverse flows on fish. According to this review, reverse flows may influence the number of fish lost via entrainment into the CVP and the SWP pumping plants."

Comment: [Page V-27, 1st full para., 1st sentence] We believe that global warming is still a theory and not yet a fact. (DWR-2)

Response: The sentence has been modified.

Comment: [Page V-32, 1st full para.] This paragraph states that "quantification of the declines [in aquatic resources] has only been done for a few factors such as outflow and diversion." Whether such quantification has ever been successfully achieved for any factor, however, is a matter of ongoing scientific debate. This statement would be more accurate if the word "attempted" were substituted for "done". (JCWU-1)

Response: To minimize confusion, the text has not been changed. Numerous attempts to correlate declines of aquatic resources with various physical parameters may have been attempted. Most of these analyses were probably not published. According to the documents reviewed, only those utilizing outflow and diversions have shown statistically significant results.

B. Population Trends and Causes of Declines

Comment: [Page V-36, para. 5] The description regarding the relationship between phytoplankton growth rates and location of the entrainment zone is incorrect. (DWR-2)

Response: The text of the draft environmental report accurately reflects the discussion on page 10, second paragraph, of the source document (Kimmerer 1992). The section on the entrainment zone has been rewritten to reflect current and evolving theories of the physical and biological mechanisms operating in the Estuary.

Comment: [Page V-45, para. 4] The section on causes of decline in zooplankton should be updated based on Kimmerer 1994 (*Kimmerer, W.J., E. Gartside, J.J.Orsi. 1994. Predation by an introduced clam as the likely cause of substantial declines in zooplankton of San Francisco Bay. Marine Ecology Progress Series. Vol. 113:81-93. 13 pp.*). (DWR-2)

Response: Text is added to include the findings in the publication.

Comment: [Page V-55] The section on Sacramento splittail does not mention recent data on habitat use that have been developed in connection with technical review of the biological opinion being prepared to support possible ESA determinations involving the Sacramento splittail. To ensure a more complete analysis of this issue, SWRCB staff should obtain and review these data before finalizing the environmental report. (DWR-2, JCWU-1)

Response: The text is modified to include current information that was not available when the draft environmental report was written.

Comment: The following comments state that the decline of the subject species is not due to low flows in the San Joaquin River. (SJTA-2)

1. [Page V-58] According to the draft environmental report, the cause of decline of white catfish appears to be south Delta exports. Inadequate San Joaquin River flows are not listed as a cause of decline. It is, therefore, unlikely that increasing flows in the San Joaquin River will benefit this species by overcoming these export project-caused impacts.
2. [Page V-62] The listed causes of decline of Delta smelt include: (1) restricted habitat and increased losses through entrainment by Delta diversion; (2) movement of the entrapment zone since 1984 from Suisun Bay to the Delta river channels; and (3) increases in the proportion of water diverted from the Delta. Inadequate San Joaquin River flows are not listed as a cause of decline, and it is unlikely that increasing flows in the San Joaquin River will benefit this species by overcoming these export project-caused impacts, particularly when 100 percent of the San Joaquin River flow at Vernalis is exported during the April 15-May 15 period. Also, there is no discussion of the effects, if any, that the proposed Old River Barrier may have on Delta smelt.
3. [Page V-67] The cause of decline of longfin smelt is the increase in water diverted by the SWP and the CVP. Inadequate San Joaquin River flows are not listed as a cause of decline, it is therefore unlikely that increasing flows in the San Joaquin River will benefit this species by overcoming these export project-caused impacts.

Response: The decline in white catfish, Delta smelt, and longfin smelt is not simply due to exports. Reduced outflow from the San Joaquin River basin has contributed to the degradation of the aquatic habitat in the Estuary, independent of export impacts. The proposed standards in the spring provide protection for various life stages of a multitude of estuarine species. The flows from the San Joaquin River basin improve general habitat conditions in the lower San Joaquin River and Delta. White catfish, Delta smelt, and longfin smelt will probably benefit from improved habitat conditions, resulting from increased outflows, as will other species.

The plan recommends the installation of the barrier at the head of Old River in the spring. It is expected that, as part of the evaluation of the effectiveness of the barrier, the DWR and the USBR will determine the effects of the barrier on Delta smelt and other fish species.

Comment: [Pages V-58 and V-62, para. 3] While conventional thought is that Delta smelt prefer shallow water, this may not necessarily be the case. On June 16, 1994, the IEP conducted deep and shallow water sampling with mixed results. (DWR-2)

Response: Text is added to incorporate the comment.

Comment: [Page V-60, para. 2, last sentence] After hatching, many Delta smelt may be transported downstream to the entrapment zone, and many also remain upstream to rear in the channels of the lower Sacramento and San Joaquin rivers. On the average, more Delta smelt have been caught in the Delta than in Suisun Bay, even when analyzing just the "good" years. Mid-water trawl results show an average of 37 percent of the Delta smelt are caught in Suisun Bay and 63 percent in the Delta for the period of 1967-1981. The summer townet index during the "good" period of 1969-1981 also shows an average of 45 percent of the smelt reared in Suisun Bay, while 55 percent reared in the upstream areas. (DWR-2)

Response: The text is modified to reflect the comment.

Comment: [Page V-62, para.1, 2nd sentence] Hanson (1994) conducted an analysis to specifically test the hypothesis that adult fall abundance is dependent upon geographic distribution of juvenile Delta smelt. He found no significant relationship between the percentage of juvenile Delta smelt collected downstream of the Sacramento-San Joaquin River confluence and the corresponding fall midwater trawl abundance index. This finding does not support the theory that a significant distribution of larval and juvenile Delta smelt to Suisun Bay will result in a large fall index. (DWR-2)

Response: Text is added to incorporate the comment.

Comment: [Pages V-62 and V-63] The information in this section, particularly paragraphs referencing correlations of increased diversion and decline of Delta smelt, is incorrect. The DFG and the DWR could not find any significant statistical correlations, inverse or otherwise, between Delta smelt abundance in the summer or fall and either export for the SWP and the CVP, abundance and salvage at the SWP and the CVP export facilities, or abundance or salvage levels and the proportion of inflow diverted. (DWR-2)

Response: The text is modified to incorporate the comment.

Comment: [Page 64, 1st full para.] The draft environmental report states that high flows may be detrimental to the planktonic smelt larvae. Despite this statement, the preferred alternative requires higher than historical outflows in most years. (SEWD-2)

Response: The subject paragraph reads as follows:

"The period of the Delta smelt decline includes unusually wet years with exceptionally high outflows. Very high outflows may be detrimental to the planktonic larvae which may be transported out of the Delta and into San Pablo and San Francisco bays with no way to get back upstream."

The outflows referred to in this paragraph are in excess of several 100,000 cfs. The highest outflow required in the plan is approximately 29,000 cfs. Also, the statement that the

preferred alternative requires higher than historical outflows in most years is incorrect. The objectives are designed to provide outflow patterns similar to recent historical outflows.

Also, it is important to realize that the declines cited in this paragraph may be due to sampling problems. High outflows may provide high quality habitat downstream of the sampling locations.

Comment: [Page V-67, para. 1, first sentence] One of the references cited (DWR 1992a) does not support the statement that "the factor most strongly associated with the recent decline in the abundance of longfin smelt has been the increase in water diverted by the SWP and CVP during the winter and spring months when the smelt are spawning." What DWR 1992a does say is that "a major effect of the SWP on longfin smelt appears to be due to entrainment at Clifton Court Forebay." Please correct this sentence. (DWR-2)

Response: The sentence is corrected.

Comment: [Page V-67] The discussion in this section on correlation analyses of flow and species abundance should be qualified to reflect that such correlations do not demonstrate cause and effect. In addition, the use of the term "breaking down" in the last paragraph on page V-67 is unclear and should be explained. (JCWU-1)

Response: The following sentence is deleted: "This suggests that increased Delta outflow during December-May should increase the abundance of longfin smelt". Breaking down means that as more data points are collected and incorporated into the regression equation, the association between outflow and longfin smelt abundance becomes weaker.

Comment: [Page V-73, last two para.] Hatchery production supplements the spring- and winter-runs in addition to the fall- and late fall-run mentioned in the draft environmental report. Peak fall-run spawning occurs in October and November in the Sacramento Valley streams and a little later in the San Joaquin system, not the October through March period mentioned in the report. (DWR-2)

Response: The text has been corrected.

Comment: [Page V-73, 3rd full para., last sentence] The statement that the Central Valley chinook salmon population now consists primarily of fall-run fish raised in hatcheries is inconsistent with the statement on page V-75 that total escapement averaged 247,100 natural spawners and 28,500 hatchery spawners. (SJTA-2)

Response: The statement has been deleted.

Comment: [Page V-74, para. 1] The draft environmental report states that the San Joaquin River system supports a population of late fall-run chinook. There is little basis to conclude that there is currently a distinct population of late fall-run in the San Joaquin River or its

tributaries, apart from late fall-run strays from the Sacramento River system and late spawning San Joaquin fall-run fish. (DWR-2, SFPUC-2, SJTA-2)

Response: The DFG document "Restoring Central Valley Streams: A Plan For Action" November, 1993, states that there are small populations of late fall-run chinook salmon in each of the Merced, Stanislaus and Tuolumne rivers. Further monitoring, documentation, and studies could be conducted on the runs of salmonids in the San Joaquin River basin to determine the magnitude of these runs and whether there are distinct runs of late fall chinook in these rivers or whether these fish are observed later in the year due to variable timing of returning of the fall-run chinook. The text has been modified as follows: "The San Joaquin River system supports fall-run, and possibly a small population of late-fall-run chinook salmon."

Comment: [Page V-74, para. 1] Based on recent trawls at Sacramento, late-fall migration through the Delta likely occurs in November and December but may peak in January and February, not possibly in January as indicated in the text. It isn't clear that there were "enormous runs of salmon in the upper Sacramento, Pit and McCloud rivers" in 1942. There are not good data on this but Kelley et al (1987) showed that the Central Valley catch and spawning escapement was low through about 1942 and rebounded to near peak levels by the mid-1940's. On the Feather River, by the time that Oroville Dam was built in the mid-1960's, most of the upstream habitat had already been lost. This isn't clear in the text. (DWR-2)

Response: The text regarding late fall-run migration is consistent with the comment. The environmental report simply makes a distinction between the timing of the natural and hatchery-produced late fall-run smolts, as follows: "Significant emigration of naturally-produced (emphasis added) juveniles occurs through November, into December, and possibly January. Emigration of hatchery-produced juveniles occurs well into February (DFG 1993)".

The source document, "Restoring Central Valley Streams: A Plan For Action", states that: "Based on gill-net catch data for the Sacramento-San Joaquin rivers it has been estimated that the peak chinook salmon runs in the Sacramento River system may have been as large as 800,000 to 1 million fish, with an average run size of about 600,000 fish prior to 1915." These runs are characterized as enormous in the text. However, the source document also states that: "Generally, only sparse or incomplete population estimates are available for years prior to 1953." This sentence is added to the environmental report.

The SWRCB is not aware of a reference that documents that most of the upstream habitat on the Feather River was lost prior to construction of Oroville Dam. Therefore, no clarification was added to the text.

Comment: [Page V-76, 2nd full para.] The lowest escapement ever observed in the San Joaquin River basin was 320 fish in 1963. This information was submitted during the D-1630 proceedings and can be found in the reference WRINT-USFWS-7, p.6. (SJTA-2)

Response: The text has been changed to incorporate the comment

Comment: [Page V-79, 2nd full para.] The winter-run on the Sacramento River is the only one in the world, not just in California. There might have been one on the Calaveras River, but its existence is poorly documented. There really are not any reliable data to document that the winter-run declined after Shasta was closed. (DWR-2)

Response: The text is amended to state that the only winter-run in the world is in the Sacramento River. The statement that winter-run declined after Shasta was closed came from the document, "Restoring Central Valley Streams: A Plan For Action", which was cited in the text. That document states that when completion of Shasta and Keswick dams in the early 1940's blocked access to the upper Sacramento tributary streams, the population began declining but recovered dramatically during the 1940's and 1950's, apparently by taking advantage of cool water released from the reservoirs in the summer.

Comment: [Page V-80, 3rd full para., last sentence] We suggest that you revise the statement "low population levels occurred historically and the population rebounded in the 1980's in response to high flows" to read "low population levels...in association with high flows." The higher flows led to higher escapement in large part by reducing the percentage of San Joaquin River water diverted by the CVP and the SWP, and thereby significantly reducing smolt mortality associated with the pumps.

Response: The text has been changed as recommended by the commenter. However, the commenter's assertion that the higher escapement is due in large part to the reduction in the in the percentage of San Joaquin River water diverted by the CVP and the SWP is speculative.

Comment: [Page V-80, last sentence] The draft environmental report notes the responsibility and significance that Friant Dam has had in regard to the reduced production and survival of salmon throughout the San Joaquin system. This fact cannot be ignored when allocating responsibility. Suitable San Joaquin River flows must be provided by the USBR. Alternatives to providing the water from Friant Dam include releases of USBR water through New Melones or transferring water through the Delta Mendota canal and San Luis Reservoir. (SJTA-2)

Response: Comment noted. Water allocation responsibilities will be dealt with in the water rights phase. At this time, the SWRCB is not setting any instream or water quality standards outside of the legal boundaries of the Delta.

Comment: [Pages V-80 to V-82] Throughout this section are numerous statements regarding the impacts of the export projects on the San Joaquin River chinook salmon population. The draft environmental report points out that the salmon populations have been severely affected by pumping operations in the Delta and that peak chinook salmon losses occur at the State and federal export pumps in April through June when the fall-run smolts

are passing through the Delta. The burden of mitigating project-created impacts to the San Joaquin chinook salmon population cannot be transferred to other entities. The projects must be held responsible for flows necessary to permit export pumping, whether those flows are operational carriage water or additional flows to offset and mitigate the project impacts.

Additionally, to the extent that dissolved oxygen problems near Stockton are the result of dredging activities and effluent discharges in the Stockton Ship Channel and turning basin, the burden of mitigating these impacts cannot be transferred to other entities.

It is true that chinook salmon escapement in the San Joaquin River basin is correlated with spring flows at Vernalis 2 1/2 years earlier. However, the causes of this correlation require further analysis. For example, in month-by-month comparisons, the strongest correlation by far is between June flow and escapement, although the peak of smolt outmigration is in May. The correlation with July flow is about as strong as that with May, and stronger than any other month except June, even though there are never any smolts in the San Joaquin River in July. These observations are difficult to reconcile with the simple cause and effect relationship suggested in the text. The poorest correlations of all are for the months of September, October, and November, when the upstream migration of parent spawners takes place. It is, therefore, ironic that reference to flow-escapement relations to justify increased spring flow at Vernalis is immediately followed by a claim that increased fall flow would benefit upmigrating adults. (SJTA-2)

Response: The chinook salmon problem is not simply an export problem. Reduced outflow from the San Joaquin River basin has contributed to the degradation of the aquatic habitat in the Estuary, independent of export impacts. The proposed standards in the spring provide protection for various life stages of a multitude of fish species. The flows from the San Joaquin River basin are to contribute to and improve general habitat conditions in the lower San Joaquin River and the Delta. Chinook salmon will probably benefit from improved habitat conditions, resulting from increased outflows, as will the Delta smelt, striped bass and other species.

The pulse flow in the fall is intended to attract the chinook salmon upstream to the tributaries; improved water quality would be an additional benefit. The dissolved oxygen sag in the Stockton Ship Channel in the fall is due to many factors.

There is a strong correlation between spring flows on the San Joaquin River and returning adult salmon 2 1/2 years later. This relationship indicates that favorable flow conditions in the spring will improve smolt survival through the Delta, a time in the life cycle and location where the mortality can affect the number of returning adults. This relationship is documented in a number of DFG and USFWS publications. It is true that the causes of this relationship could benefit from further analysis; nevertheless, objectives should be based on the best available information. The basis for the pulse flow in the fall, however, has nothing to do with the relationship between spring flows and number of returning adults. It is based on observations by the DFG that low flows in the fall can delay the upstream migration of

fish to the tributaries, and to the hatchery on the Merced River. The delay in migration and spawning, among other things, can lead to decreased spawning success and delay in the outmigration of smolts the following spring.

Comment: [Page V-81] The Four-Pumps Advisory Committee has approved a permanent barrier on the San Joaquin River near its confluence with the Merced River. In the last paragraph, minimum flows may not help salmon. (DWR-2)

Response: The information regarding construction of a permanent barrier has been added to the text. The issue of minimum flows in the San Joaquin River in the fall to benefit salmon is discussed in section A.4.a of Chapter VIII.

Comment: The following comments concern the issue of the effect of temperature on salmon and whether temperatures in the Delta are controllable.

1. [Page V-81, 1st sentence] The draft environmental report concludes that San Joaquin River basin smolt losses can be attributed to high temperatures. This is contrary to the conclusion reached by the USEPA that "...experimental data from releases near the upstream edge of the Delta did not show a statistical relationship between survival and temperature at release. In other words, on the San Joaquin River, temperature should not be used as the independent variable in the criteria." (40 CFR Part 131; 60 FR 4664, 4690). (SEWD-2)
2. [Page V-81, 1st sentence] There is no evidence that temperatures in the San Joaquin River affect either salmon recruitment or escapement. Temperature has not been demonstrated as a significant factor in survival of outmigrating juvenile salmon in the San Joaquin River. The San Joaquin River population of chinook salmon is the most southerly population and, therefore, might be expected to be least susceptible to high temperatures. Figure 1 in the SJTA's comments on the draft plan is a figure showing the daily average water temperature for water released from New Don Pedro between 1978 and 1993. Except for a few days in 1980, the temperature of water released from New Don Pedro has ranged from 47°F and 53°F, well below the temperatures needed for chinook salmon. (SJTA-2)
3. [Page V-98] Numerous participants have commented in the past on the effects of reservoir releases on downstream temperatures (e.g. WQCP-CVPWA-204). The SWRCB concluded in the 1991 Bay-Delta Plan that reservoir releases were not a controllable factor for achieving water quality temperature objectives. (SJTA-2)

Response: The environmental report presents findings of other agencies on the status, trends, and causes of the decline of various aquatic resources in the Estuary. The DFG concludes that high temperature is one of the many factors that cause mortality to San Joaquin River smolts migrating downstream. The reference for this information, DFG (1993), is cited in the report. The USFWS conducted experiments with hatchery-reared fall-

run chinook salmon, and the results indicate that temperature, along with several other environmental conditions, influences survival as they migrate through the Delta. The USFWS has not recommended a particular temperature, and the plan does not establish a temperature standard in the lower Sacramento or San Joaquin rivers.

The USEPA analyzed the available smolt mortality data for the development of its water quality standards and concluded that experimental data on the San Joaquin River did not show a significant statistical relationship between survival and temperature at the time of release of smolts. Nevertheless, the revised USFWS San Joaquin River smolt survival model uses temperature at Jersey Point as one of the factors used to calculate smolt mortality.

Whether elevated water temperatures affect smolt survival is an issue of ongoing discussion among the parties. Even though data are not available to conclude a statistically significant relationship with smolt mortality, salmon smolts are known to be temperature sensitive, and it is reasonable to postulate that temperature, in conjunction with other factors, can cause smolt mortality in the San Joaquin River basin.

The environmental report notes that water temperatures in the Delta can only be minimally controlled. The fact that even large cold water releases from reservoirs result in only small changes in Delta water temperatures caused the SWRCB to conclude in the 1991 Bay-Delta Plan that controlling temperature in the Delta through reservoir releases does not appear to be reasonable.

Comment: [Page V-82, 1st full para.] The discussion regarding studies using fall-run salmon should specify that hatchery fall-run chinook were used in the tests. (DWR-2)

Response: The description "hatchery-reared" is added to text. In the next paragraph, the text already includes the reference to hatchery-reared salmon.

Comment: [Page V-83, last para.] We don't really know when spring-run smolts migrate, or even if they actually migrate as smolts. There is some evidence they migrate as post smolts and there are no data indicating that Delta mortality is significantly controlling their abundance. We are not even sure when they move through the Delta. (DWR-2)

Response: The information on spring-run chinook salmon was submitted by the NHI and cited in the text. No other specific information on the timing of spring-run migration through the Delta was provided.

Comment: [Page V-84, 2nd full para.] As with spring run, it is not clear when steelhead move through the Delta, but the highest catches at the salvage facility occur in winter months. This doesn't seem consistent with the present text. (DWR-2)

Response: The following sentence has been added to the text: "Average monthly SWP fish salvage data, for the years 1980-1991, indicate most steelhead are salvaged in the late winter

and early spring, with the peak occurring in March and April (Steve Ford, DWR, pers. comm., April 1995)".

Comment: [Page V-90, para. 5] The relationship between striped bass young-of-the-year and toxics is just as strong as the DFG's outflow/export relationship. Also, add "and decreased outflows during the recent 6-year drought" at the end of the sentence that ends with the reference DFG 1992a. (DWR-2)

Response: A discussion of the effect of toxics on striped bass survival is provided in the second full paragraph on page V-94 of the draft environmental report. The recommended phrase is added.

Comment: [Page V-92, Figures V-41 and V-42] The figures show that the decline in striped bass populations occurred primarily in the older age classes. The age 3 numbers in the early 1980's were comparable to previous years, but the recent drought appears to have caused a decrease. The older fish declined much earlier. (DWR-2)

Response: It is likely that the drought, in combination with other factors, affected striped bass populations. However, the graphs do not establish a cause and effect relationship.

Comment: [Page V-93, para.1, last sentence] Add "however, a large percentage of striped bass rear in the Delta". (DWR-2)

Response: The sentence is: "Higher outflows may also shift the entrapment zone to a location downstream of the Delta, where larval striped bass appear to survive better (DWR 1992a)." The purpose of the sentence is to indicate the apparent benefit to the striped bass of rearing in the entrapment zone when it is downstream of the Delta, rather than identifying the relative abundance of juvenile striped bass in various locations in the Delta.

Comment: [Page V-93, para. 4] Figures VI-1 and VI-2, referred to in this paragraph, are an oversimplification of the striped bass model. Although they may illustrate relative effects, actual numbers should be viewed with caution. (DWR-2)

Response: The text (section B.7.d of Chapter V) states: "Figures VI-1 and VI-2 in Chapter VI show the relationship between mean exports and outflow during April-July and August-March, respectively, to maintain a striped bass population of 1 million, assuming various young-of-the-year indices. These figures represent a simplification of the DFG's striped bass model and illustrate how outflows and exports may be managed to maintain striped bass populations in the Estuary". Later, in section VI.D of the draft environmental report, the text states: "The statistical validity of the DFG's striped bass model has been reviewed (DWR 1992c). This review concluded that the model has poor predictive ability. Statistical criticisms of the model include multicollinearity, autocorrelation, averaging, and propagation of errors." The purpose of these figures is to illustrate the DFG's opinion on the relative

effects of exports and outflow on striped bass survival. The limitations on the use of the model and the figures are articulated.

Comment: [Page V-94, 1st full para.] The inland silverside and the striped bass also compete in the Suisun Bay and Marsh. (DWR-2)

Response: The text has been amended to reflect the comment.

Comment: [Page V-95, para. 5, second sentence] The effect of outflow on water temperature is not "the" mechanism, but one possible mechanism that explains shad recruitment in drier years. (DWR-2)

Response: The sentence has been amended to state that a mechanism that may explain the linkage of shad abundance with outflow is the effect of outflow on water temperature.

Comment: [Page V-97] The SWRCB's authority to impose terms and conditions on a licensed water right is limited to situations where it has reserved jurisdiction or has exercised its authority pursuant to State law and SWRCB regulations regarding a finding of waste or a specific unreasonable use. (SJTA-2)

Response: This is a water rights issue which may be considered during the water rights phase of this proceeding.

CHAPTER VI. MODEL DESCRIPTIONS

A. DWR's Planning Simulation Model

Comment: I am concerned about the SWRCB relying on the project operators to provide the SWRCB and the public with modeling results from DWRSIM when they are the ones being regulated. Who will be held responsible if the assumptions in the model fail to be accurate? (PORGANS-2)

Response: The DWR developed DWRSIM, and it is the principal user of the model. All of the participants in this proceeding relied on the DWR to provide DWRSIM model results to analyze alternatives. The SWRCB believes that the model is the best tool available to analyze the effect of new standards on project operations, and the DWR is best qualified to run the model. Two other models were used to analyze the effect of the new standards: PROSIM developed by the USBR and an outflow/salinity model developed by CCWD. These two models provided similar estimates for the water supply impact of the SWRCB's draft plan.

With respect to the issue of responsibility, the SWRCB will review project operations during the next review of the water quality objectives, and the objectives may be modified if project operations are substantially different than the modeled operations.

Comment: An important concern regarding the water modeling analysis is the exclusion of future changes in the diversion by the CVP of water from the Trinity River. Current federal studies are underway which expect to significantly reduce the water diverted from the Trinity River to the Central Valley. This reduction (estimates of the reduction range from 200 TAF to 800 TAF) will affect the ability to maintain both water quality and temperatures that currently support fish and wildlife habitat in the Central Valley and hence the Bay-Delta. This scenario should be further explored as part of the Bay-Delta assessment to identify potential impacts and mitigation factors. (NCPA-1)

Response: The water supply modeling incorporates all of the existing requirements on the CVP and the SWP. Future, potential requirements were not incorporated. Such requirements, including the Trinity River diversion, were discussed in Chapter VIII under cumulative impacts.

Comment: [Page VI-1, para. 3] The draft environmental report states that the CVP and the SWP export demands south of the Delta are based on the 1995 level of land use patterns (i.e., acres irrigated). Racanelli found the level of export/land use irrigation demands of 1978 (D-1485) lacked measures and action to sufficiently protect several aspects of fish, habitat, and other beneficial uses. What is the justification for using the 1995 land use pattern figures instead of the 1978 land use pattern and water demand? If the 1995 land use pattern/irrigation demand is used, then the inflow-Delta conditions which provided for the highest salmon populations should be used (adult returns 68,485 fish) on the San Joaquin River tributaries, not the 1967 to 1992 average of 20,644 (Mills and Fisher DFG 1994).

Is the 1995 level of development being used to protect investments of special interest folks who were foolish to buy land without a water supply? Is this an effort to protect special interest investments for a future buy-out program as a way to get around the no-compensation-rule? (SARA-1)

Response: A principal purpose of the environmental report is to analyze the effect of the objectives under existing conditions. The 1995 level of development constitutes existing conditions. Land use patterns and salmon populations have changed over time.

Comment: [Page VI-2, 5th full para.] The draft environmental report indicates that interpretation of modeling results are subject to the uncertainty of the CVPIA allocation of the 800 TAF because "the USBR has not yet established criteria on how this obligation will change CVP operations". Despite this statement, for the past three years, the USFWS has allocated 200 TAF of the 800 TAF from New Melones. Given this precedent, the environmental report should evaluate this additional impact regardless of its establishment as a permanent criteria. (SEWD-2)

Response: The SWRCB has identified the CVPIA requirements as a cumulative impact in Chapter VIII. However, the long-term allocation of the water set aside by the CVPIA has not been established, and consequently, it has not been incorporated into this analysis.

The water supply impact analysis is largely dependent upon DWRSIM studies of the base case and the preferred alternative. These studies are conducted, at the SWRCB's request, by the DWR. The DWR consulted with the USBR regarding operating assumptions at New Melones Reservoir, and incorporated their recommendations into the DWRSIM operations studies.

C. Striped Bass Model

Comment: [Page VI-3] A model by C. Foe of toxics vs. abundance of striped bass has also been developed. (DWR-2)

Response: The model developed by C. Foe, of the Central Valley RWQCB correlates pounds of rice pesticides applied annually divided by the flow rate of the Sacramento River and the annual difference between the predicted and observed number of larval bass in the Delta. (DWR. 1992. *Bay-Delta Fish Resources, by Dr. Randall Brown. Department of Water Resources. 46 pp. WRINT-DWR-30*). The primary reason why a discussion of this model was not included in the environmental report is that the focus of the plan is on salinity, flow, and water project operations. Toxics issues are not addressed in this forum. The text has been revised to clarify this issue.

Comment: [Pages VI-4, 3rd full para.] As noted in the draft environmental report, the striped bass model has "poor predictive ability" and several intrinsic statistical defects. For that reason, the model should not be used as the basis for any analysis contained in the draft environmental report. This section should, therefore, be deleted. (JCWU-1)

Response: In section D of Chapter VI of the draft environmental report, the text states: "The statistical validity of the DFG's striped bass model has been reviewed (DWR 1992c). This review concluded that the model has poor predictive ability. Statistical criticisms of the model include multicollinearity, autocorrelation, averaging, and propagation of errors." The limitations of the use of the model are adequately articulated. The purpose for including the model is to illustrate the factors that the DFG believes affect striped bass populations.

E. Salmon Models

The following comments address the validity of the USFWS salmon smolt survival models:

1. Comment: At various locations within the draft environmental report, the USFWS salmon smolt survival models have been used to indicate an anticipated biological response of salmon to the proposed standards. The validity of the models has been critiqued during the past year and as a result the use of the models as predictors of response has been cautioned. We recommend that the depiction of absolute values of salmon survival derived from the models be removed. (SFPUC-2)

2. Comment: If the statistical validity of the USFWS models are so criticized, why is the SWRCB using them for its analysis? It is inappropriate to use the models for the purpose of determining outflows and for setting policy. The models do, however, show the significance that the Old River Barrier has on the survival of salmon smolts migrating through the Delta. The SJTA analyzed several pulse flow alternatives with and without the Old River Barrier using the EA chinook salmon model, which incorporates the USFWS salmon smolt models. The results showed that with the Old River Barrier in place, there was a three- to four-fold increase in salmon population over the base case through a ten year period of analysis. Without the Old River Barrier, there was less than one-fold increase due to smolt mortality at the export pumps. (SJTA-2)
3. Comment: The inclusion of the resource model results in Chapter VIII implicitly suggests that those results and the models used to obtain them represent the best science available. The population models used to produce these results are generally based on incomplete data and incorporate numerous unverified assumptions. Much of the scientific community would likely disagree with any attempts to use such crudely derived models as quantitative management tools. We recommend that the text on pages VIII-24 through VIII-31, be omitted, and that the discussion of the biological benefit of the objectives be limited to the more general qualitative analysis presented on pages VIII-15 through VIII-24. (BISF-2)
4. Comment: As noted in the last paragraph on page VI-11 of the draft environmental report, the statistical validity of the USFWS smolt survival models has been disputed. The smolt survival models have several inherent analytical problems and should not be used as the basis for any analysis contained in the draft environmental report. This section should be deleted. (JCWU-1)

Response: The bases of the USFWS salmon smolt survival models have been challenged. The criticisms of the models include: the fundamental assumptions; the data sets used; the statistical analyses of the data; and the statistical validity of the model construction.

The salmon smolt models are not used as quantitative management tools; the models are not used to set policy or to establish the outflow or export objectives. The models are used for qualitative comparisons among alternatives and to illustrate the factors that are believed to affect smolt survival. Also, the models have been the subject of a great deal of discussion and evaluation among scientists working in the Delta, and their results are of informational interest.

CHAPTER VII. WATER SUPPLY IMPACTS OF PREFERRED ALTERNATIVE

Comment: [Page VII et seq.] The draft environmental report does not comply with Water Code section 13241. The SWRCB must consider the current beneficial uses of water within

the area of origin and water quality objectives for the reasonable protection of the uses of water put to use by the Nevada Irrigation District (NID). (NID-2)

Response: Section 13241 does not require the SWRCB to establish objectives for the protection of beneficial uses outside of the area under consideration. The SWRCB will consider the NID's beneficial uses before assigning responsibility to the NID for meeting objectives.

Comment: Water supply is included as a separate section [Chapter VII], rather than being incorporated in the environmental impacts discussion [Chapter VIII]. This may have been done to clarify that the document satisfies obligations both under the Porter-Cologne Act and for environmental review. Additional language is recommended for the second paragraph on page VII-1 to clarify the relation between the water supply and environmental impact analyses. (JCWU-1)

Response: The water supply impact analysis [Chapter VII] is separated from the environmental impacts analysis [Chapter VIII] because the base case (or reference case) is different in these two analyses. The base case for the water supply analysis is existing level of demand. The reference case for the environmental analysis is historical operations, and historical demand, from 1984 to 1992. If historical operations were used as a base case for the water supply analysis, the conclusion would have been that there is no impact to exports associated with adoption of the draft plan because projected export levels would be approximately the same as the export levels over the historical period. This conclusion would be incorrect because it ignores the fact that export demands have increased.

A sentence has been added to the second paragraph of this chapter to clarify that export levels and reservoir storage are also discussed in Chapter VIII as a component of the environmental impact analysis.

A. Modeling assumptions

Comment: [Page VII-1] Club FED has some concerns about the modeling assumptions used in the preferred alternative, and the CVP/SWP operational framework used to portray the strategy to meet the preferred alternative. The effort to model the preferred alternative and the operational strategy of the CVP/SWP system is an ongoing process and the models and assumptions are being constantly refined. Therefore, the numerical results from the studies analyzed and reported by SWRCB staff in the environmental report on the basis of three modeled components (total export reductions, Sacramento River Basin storage changes, and San Joaquin River Basin water supply impacts) should not be considered as definitive and are subject to change as knowledge and assumptions change. The areas of particular concern in the modeling studies are: (1) export operations during the San Joaquin River pulse flow months of April and May; (2) upstream operations of CVP facilities and how they interact with the preferred alternative criteria in the Delta and upstream objectives such as instream flow issues, and especially temperature control objectives in the upper Sacramento River; and

(3) use of New Melones as a surrogate measure for the San Joaquin River system and the operational implications to this CVP facility. (USBR-1)

Response: The SWRCB is aware that the modeling assumptions may change in the future. The SWRCB has emphasized that modeling results must be interpreted with care and full consideration of the modeled conditions and assumptions. However, the assumptions used are, in the SWRCB's view, the most reasonable assumptions at this time.

Comment: [Page VII-4] Full compliance with the southern Delta agricultural standards through freshwater releases from upstream projects has not been evaluated. Nor has compliance with the dissolved oxygen standard at Stockton been evaluated if fresh water releases are considered the only measure to achieve the standard. The SWRCB should consider the reasonableness of compliance with these standards during the water rights phase. (SFPUC-2)

Response: Since the plan does not implement these standards, it is not necessary in the environmental report to evaluate their effects. Further, such an evaluation would be speculative since the alternative methods to implement these standards are not yet determined. (See 14 Cal.Code Regs. §15145) The SWRCB will consider the reasonableness of implementing these standards during the water rights phase.

Comment: [Page VII-4, para. 3] Why does DWRSIM make releases from New Melones to meet flow requirements on the San Joaquin River? Even given the assumption that the environmental report uses the CVP as surrogates for all water right holders, there are other CVP units capable of providing the required San Joaquin River flows. (SEWD-2)

Response: The only reservoir modeled by DWRSIM in the San Joaquin Valley is New Melones. Therefore, New Melones was used as a surrogate for the total storage impact of the objectives on San Joaquin Basin storage.

Comment: [Page VII-4, para. 4] DWRSIM places a cap of 70 TAF on the water releases from New Melones reservoir to meet water quality objectives at Vernalis. Such a cap is unsupported in law or in fact given the increases in poor quality agricultural drainage noted in the environmental report. Such a limitation is particularly offensive when the SWRCB has done nothing to reduce the poor quality of San Joaquin River water which would make such a limitation more realistic. (SEWD-2)

Response: The assumption of the 70 TAF cap is not based on any legal limits. D-1422 requires the USBR to release sufficient water to achieve the salinity objectives at Vernalis. However, it is a reasonable assumption in this analysis because salinity control over the long term is unlikely to be achieved exclusively through releases of high quality water from upstream reservoirs. Additional measures, including control of saline discharges and discharge of saline water to a salt sink, must also be considered. The SWRCB will consider the issue of salinity control at Vernalis during the water right phase of the proceedings.

In the 1991 Bay-Delta Plan, the SWRCB directed the Central Valley RWQCB to reduce salt loads to the San Joaquin River by ten percent. The RWQCB responded by requiring drainage operation plans from the areas on the westside of the San Joaquin River with the worst drainage problems. The drainage operation plans focus on water conservation to reduce salt and trace metal loading to the river.

B. Water Supply Impacts

Comment: The SWRCB estimated the water costs of the draft plan at 300 TAF in average years and 900 TAF in drought years. These water costs, however, are estimated by comparing the draft plan's Delta export rates with inflated base export rates, thus producing inflated water costs. A better approach is to compare the plan's Delta exports with the historical Delta exports that caused the decline of the Delta fisheries. When this comparison is done, the results show that the SWRCB's draft plan allows the State and federal projects to increase exports. (PORGANS-1)

Response: The environmental report uses a base case for the water supply impact analysis of existing demands and modeled operations over the 1922 to 1992 historical hydrology, and a reference case for the environmental analysis of historical operations from 1984 to 1992. The base case for water supply impact analysis was chosen because it would be incorrect to assume that demands for water supply are not increasing. Water supply agencies receiving export water from the Delta have planned their operations on the assumption that Delta water would be available under D-1485 regulatory conditions. On the other hand, the environmental analysis must be based on the conditions actually experienced in the Estuary.

The commenter correctly notes that, if the hydrology of 1984 to 1992 reoccurs, exports will be larger by a small amount under the regulatory conditions of the plan than occurred over the historical period of 1984 to 1992. The higher exports are driven by the higher existing demands. Under the same demand conditions, exports would be substantially lower under the new plan compared to D-1485 conditions. The observation that exports would increase under the plan in comparison to the 1984-1992 reference condition is discussed in Chapter VIII of the environmental report.

Comment: [Page VII-4, para. 3] The impact analysis in the environmental report incorrectly assumes that, if there is insufficient water from the CVP's entitlement in New Melones to meet all of the Vernalis requirements, additional water is supplied from the San Joaquin River upstream of the Stanislaus River. Such a premise not only ignores California water rights law, but it fails to adequately assess the impacts of the preferred alternative. To the extent that the USBR is unable to provide the required Vernalis flows, allocation of responsibility must be based on the priority system. On page VII-4, the statement "if there is insufficient water in New Melones to meet all of the requirements, the model obtains additional water from the San Joaquin River upstream of the confluence with the Stanislaus River" should be revised. A more proper characterization of the model's operation is that

the model obtains water from unspecified sources within the San Joaquin River Basin. (SJTA-1, SJTA-2)

Response: For modeling purposes, the DWR was requested to model the water supply impacts for the San Joaquin River Basin by assuming that the necessary releases are made from New Melones Reservoir. Any flow requirements in excess of New Melones capacity are assumed to be provided by unspecified sources. No inference should be made from these assumptions regarding distribution of water supply impacts to specific water right holders. The SWRCB has not determined who will share in that responsibility, or how the impacts will be allocated. The allocation process will be the subject of a water rights proceeding which will commence following adoption of the plan. To clarify this point, statements in Chapter VII and Chapter XI have been amended to state that additional water will come from unspecified sources.

Comment: [Page VIII-4, para. 3] The draft environmental report acknowledges that if New Melones flows are insufficient, other upstream water is assumed. This ignores reality. During the three years before completion of the water rights phase, there will be no upstream allocation for the objectives. (SEWD-2)

Response: The plan does not require that the objectives be met from New Melones Reservoir during the period before a water rights decision is issued. The assumption of upstream water addresses the results after the objectives are implemented.

Comment: [Page VII-5, 1st full para., 2nd sentence] There should be no inference regarding the distribution of water supply impacts to anyone other than the CVP and the SWP. The plan covers only a three year period during which the USBR is required to meet the San Joaquin River flow objectives, in accordance with the biological opinion for Delta smelt. The SWRCB is not considering allocation of flows at this time. Allocation of this responsibility among the water right holders in the watershed will be the subject of a water rights proceeding scheduled to commence following adoption of the plan. Consequently, the impacts described in the environmental report should only be limited to those areas dependent upon flows provided by the USBR's entitlement from New Melones. The proper time to evaluate the impacts of any proposed allocation scheme is during the water rights phase. (SJTA-1)

Response: The SWRCB is not responsible for analyzing the effects of the biological opinion for Delta smelt. It is not the intent of the SWRCB to infer in the environmental report distribution of water supply impacts to anyone, including the SWP and CVP. The environmental report states that "no inference should be made from this analysis regarding distribution of water supply impacts to specific water users." As noted by the commenter, the SWRCB is not considering allocation of flows at this time. Furthermore, the report specifies that "the SWP and CVP are used as surrogates in order to determine the overall water supply impacts." The discussion of impacts is meant to be of a general nature,

encompassing upstream, downstream, and in-Delta impacts, and does not infer any specific allocation of responsibility.

The Principles for Agreement applies for the next three years, but the water quality control plan, once adopted, remains in effect until amended by the SWRCB. California Water Code Section 13240 requires that water quality control plans adopted by the SWRCB must be periodically reviewed and may be revised. In addition, the Clean Water Act requires a triennial review of water quality control plans. The program of implementation of the draft plan states that the San Joaquin River flows are interim flows and will be evaluated as to timing and magnitude in the next three years. The water right decision is expected to be completed within this time period and the existing flows are the most likely flows that will be incorporated into that decision.

Comment: [Pages VII-7 through VII-10] The following comments express concerns regarding the water supply impact of the plan on NID. (NID-1, NID-2)

1. A SWRCB water right decision that required a change in our operations could conflict with (1) existing contracts between the NID and the PG&E, (2) agreements with the DFG, (3) a Davis/Grunsky contract with the DWR, and (4) the NID's FERC license.
2. The NID urges the SWRCB to consider all beneficial uses of water, especially the multiple uses that occur within the NID's district. Public trust needs are present within the areas of origin that must be met by use of water storage and stream flow facilities.
3. The NID urges the SWRCB to consider allowing water transfers between willing sellers and buyers with as little administrative interference as possible.
4. The draft environmental report's failure to recognize that the plan will cause changes in the NID's reservoir operations is unacceptable. The SWRCB must recognize that there will be significant impacts on local water supplies by imposition of the standards. The SWRCB cannot assume that they are largely speculative. (NID-1, NID-2)

Response: All of these issues can be considered during the water rights phase, but they are not ripe for consideration in the draft environmental report. The draft environmental report cannot analyze the potential effects in the areas of origin in detail because the alternatives for allocating responsibility for meeting the objectives have not yet been developed. Therefore, the draft environmental report analyzes only the overall impacts without going into detail with respect to individual locations, such as the NID's service area, within the area of origin. Until the SWRCB has developed a water right allocation alternative that will impact the NID's water supply, it would be unduly speculative to attempt to analyze the effects on the NID's water supply. CEQA does not require speculation. (14 Cal. Code Regs. §15145.)

Comment: [Pages VII-7 through VII-10] The SWRCB cannot adopt the standards and look for the water later. The analysis of the effects of the standards on the NID must occur first. (NID-2)

Response: This comment is inconsistent with the guidance of the Court of Appeal in the Racanelli Decision (United States v. SWRCB (1986) 182 Cal.App.3d 82, 227 Cal.Rptr. 161) which advised the SWRCB, with respect to the 1978 water right decision and plan, that it should have adopted the plan first, to ensure that it set adequate water quality objectives, and only then should have considered the water rights issues. The SWRCB is following the Court of Appeal's guidance.

Comment: [Page VII-7] The draft environmental report does not clearly specify whether the increase in Sacramento River Basin storage is a result of reduced exports by the CVP and the SWP, increased export of San Joaquin River flows during the spring and fall, changes in project operations as a result of the winter-run biological opinion, or a combination of all three. To the extent that Sacramento River Basin storage is increased as a result of CVP and SWP export of the additional San Joaquin River flows, the projects alone must be held responsible for providing the flows necessary to permit export pumping and additional flows to offset and mitigate project impacts (SJTA-2).

Response: The water supply analysis consists of three components: export reductions, Sacramento River Basin storage changes, and San Joaquin River Basin impacts. These components are interrelated; each one impacts the others, and together they constitute the water supply impacts of the plan. Furthermore, water supply impacts cannot be ascribed to individual requirements; they are caused by the response of project operations to all of the new requirements. Even if such a determination were possible, it is not the SWRCB's intent to assign responsibility for mitigation during this water quality control plan review process. Lastly, it should be noted that the final DWRSIM analysis of the plan showed a decrease in Sacramento River Basin storage. This result is incorporated into the environmental report.

Comment: [Page VII-10] The two alternatives for analyzing San Joaquin River Basin impact are basically the same. There should be no water supply impacts to anyone other than the CVP and the SWP. The upstream projects cannot be held responsible for providing flows for the benefit of the export projects. The CVP and the SWP alone must provide the flows necessary to permit export pumping. The most important and efficient way to reduce the amount of water necessary to maintain water quality in the southern Delta is to remove the salt discharged to the San Joaquin River. It is improper and illegal to allocate responsibility for water quality control and excess fish flows to non-CVP and SWP reservoirs (SJTA-2).

Response: The purpose of the flow objectives on the lower San Joaquin River is to improve habitat conditions in the river, not to provide flow for the benefit of the export projects.

The SWRCB is not considering allocation of flows at this time. The water supply impact analysis for the San Joaquin River Basin assumes two limiting cases in order to describe, in general terms, the overall impact of the plan without specifically allocating responsibility to any particular water users.

Comment: [Page VII-11] The term "average annual additional water" is inconsistent between the two sections on this page. Is "average annual additional water" the amount of water needed from New Melones to meet the Vernalis flow requirement under the preferred alternative as compared to the base case or does it refer to the shortage on the San Joaquin River after attempting to meet the San Joaquin River flow requirement from New Melones? (SJTA-2)

Response: "Average annual additional water," as used in the first paragraph to describe impacts on New Melones Reservoir carryover storage, is the additional water in excess of New Melones releases required under the preferred alternative. The same term, as used to describe San Joaquin River flow, means the additional river flow required from the base case to meet the standards under the preferred alternative.

For clarification, the term "average annual additional flows in excess of New Melones releases" is used to describe impacts on New Melones carryover storage, and the term "average annual additional flow from the base case" is used to describe impacts on San Joaquin River flow.

Comment: [Pages V-11 and V-13] The narrative description of the potential effects to San Joaquin River flows on page VII-11 and the graph on page VII-13 illustrates the potential for masking impacts that will arise when averaging within year types. Figure VII-10 shows that during the above normal years of the simulation, the average additional San Joaquin River flow will amount to 483 TAF due to the proposed standards. However, as stated in the narrative description, the largest single year of modeled additional flow is 1963, when 897 TAF of additional release was required. There will be significant differences in impacts within year types associated with the extremes of the range of flows. We recommend that the depiction of the range of potential impacts be better illustrated and described. (SFPUC-2)

Response: Additional descriptions of the ranges of potential impacts for exports and San Joaquin River flows under the preferred alternative have been added to the appropriate sections in Chapter VII of the environmental report. For each water year type, the minimum, average, and maximum impacts of the preferred alternative on exports and San Joaquin River flows are discussed on pages VII-6 and VII-14, respectively, in the final environmental report.

Comment: [Page VII-11] This section discusses average annual decreases in New Melones storage and average annual needs for increases in San Joaquin River water in order to comply with the objectives. There appears to be no analysis of the actual operation of the

dams and how one year's depletion affects the next year's ability to meet any requirements, much less the flow objectives. (SDWA-2)

Response: Actual operation of the dams will depend on the allocation of responsibility among water users in the basin, the water quality objectives, and management decisions by reservoir operators. Allocation of responsibility among water users will be established during the water right proceeding. Management decisions cannot be foreseen at this time; thus, a detailed analysis of New Melones operation would be theoretical at this time. Reservoir operations are simulated over the 71-year hydrology in DWRSIM, representing the best available method of analyzing the water supply impacts of the plan. This simulation accounts for the effect of one year's depletion on the next year's ability to meet requirements.

Comment: [Page VII-11, fourth paragraph] The draft environmental report states that additional Vernalis flows of 0.1 TAF, 15.4 TAF, and 8.4 TAF are provided in January, July, and August, respectively. There is no information as to why such flows are provided. If the model assumes they are needed for water quality purposes, that should be stated. (SEWD-2)

Response: Additional San Joaquin River flows provided in February through June under the requirements of the plan also incidentally provide water for meeting the San Joaquin River salinity objectives in these months. Thus, the balance of the 70 TAF of New Melones set aside for salinity control is shifted to later in the year. This shift is responsible for the additional San Joaquin River flows seen in July and August. The additional flow in January is minor. This explanation has been included in the environmental report.

Comment: [Pages VII-14 and VIII-1] The draft environmental report identifies neither impacts nor mitigation requirements. (SEWD-2)

Response: The impacts and mitigation measures the commenter references apply to an action that the SWRCB will not take when it adopts the plan. While the plan sets objectives, it is not the vehicle to implement these objectives. A water right decision in the water right phase of these proceedings will establish the final implementation measures after the SWRCB has duly considered potential effects on water right holders. That decision will be accompanied by appropriate further environmental documentation. The commenter in effect asks that the SWRCB ignore the guidance of the Court of Appeal in United States v. SWRCB, cited above. In that case the Court of Appeal directed the SWRCB to adopt the plan first and then consider implementation in a later proceeding. The purpose of this guidance was to ensure that the objectives in the plan were not driven by the effects on the SWP and the CVP.

D. San Luis Reservoir Storage

Comment: [Page VII-17, Figure VII-15] The figure shows that San Luis Reservoir will be filled over half of the time by the end of March. Some of this water should be dedicated for discharge to the San Joaquin River to meet the current and future federal obligation for fish flows and water quality. (SJTA-2)

Response: This option will be considered by the SWRCB during the water rights proceeding to implement the plan. The SWRCB is not considering allocation of responsibility at this time. Allocation of this responsibility among the water right holders in the watershed will be the subject of a water rights proceeding scheduled to commence following adoption of the plan.

Comment: The impacts to existing reservoirs are lumped together and not identified. (SARA-1)

Response: Impacts to individual reservoirs cannot be evaluated until the water rights phase when a specific water allocation methodology is being evaluated. The CVP and the SWP were used as surrogates for the total reservoir impact to the system.

CHAPTER VIII. ENVIRONMENTAL EFFECTS OF PREFERRED ALTERNATIVE

Comment: [Page VIII-1, para. 2] There should be no inference that water supply impacts will be distributed to anyone other than the CVP and the SWP. For the three-year period before the plan is implemented, the impacts described should be limited to those areas dependent upon water from New Melones. The impacts of any proposed allocation scheme should not be evaluated until the water rights phase. An EIR must be prepared before reallocating water to benefit public trust resources in the Bay-Delta Estuary. (SJTA-2)

Response: The analysis in the environmental report presents a programmatic view of the impacts of the plan when it is implemented after the water rights phase. Since the plan does not require that New Melones be used to meet the new objectives before then, the impacts of any current implementation by the CVP of similar standards need not be analyzed in the environmental report. The SWRCB will prepare appropriate environmental documentation in connection with the water rights phase of the proceedings.

Comment: [Page VIII-1, para. 2] The following comments express concerns regarding the use of the word "speculative" in characterizing impacts of the plan.

1. The use of the term "speculative" could be misconstrued to suggest that the plan and environmental report are in some way premature and/or incomplete, which they clearly are not. To avoid this confusion, modification to the existing language is suggested. (JCWU-1) —

2. The NID is concerned that the draft environmental report be designed to make the plan withstand legal challenge. It disagrees with the Joint Agencies recommendation that the language regarding the "speculative" nature of the impacts be deleted and replaced. This recommendation by CUWA/Ag is an attempt to put words in the mouth of the SWRCB staff. (NID-2)

Response: It is correct to say that certain impacts of implementation are speculative in nature. Until the SWRCB has developed the water right allocation alternatives, it cannot analyze their effects. The SWRCB will conduct appropriate environmental analysis of the effects of implementing the objectives before the implementation measures are imposed. CEQA does not require an agency to speculate as to the effects of an action. (14 Cal. Code Regs. §15145.) Here, the SWRCB is using a programmatic document; the current action will not incur the environmental effects. A future environmental document will analyze these effects when alternative actions have been developed. Under this circumstance, it is not necessary to guess as to the exact effects of the future action. In any event, the term "speculative" has been deleted. Further clarification is added to the paragraph by stating that the report need not explain in detail the as-yet unknown effects of implementing the objectives, since the SWRCB will conduct appropriate environmental analysis of the effects of implementing the objectives before the implementation measures are imposed.

Comment: [Pages VIII-1 et seq.] The draft environmental report tries to justify a preselected action. The draft environmental report should contain discussions of various alternatives that meet National Environmental Policy Act (NEPA) and CEQA requirements. (SARA-1)

Response: The environmental report discusses the alternatives in Chapter XI. This discussion meets the requirements of CEQA.

Comment: What is the baseline condition for NEPA or CEQA? This baseline condition must be carefully identified because it becomes the condition against which future actions and alternatives are measured. The baseline conditions must include the best restrictions of D-1485, draft D-1530 [sic], and the restrictions of the federal ESA biological opinions. (SARA-1)

Response: The reference conditions for the environmental analysis are described at the beginning of Chapter VIII as the actual conditions that existed in the Estuary from water year 1984 through 1992. Actual conditions are the appropriate reference condition to use for an environmental analysis.

A different base condition is used in Chapter VII for the water supply analysis. The water supply base conditions are 1995 level of demand and D-1485 regulatory requirements. This base case was used because the exporters were anticipating these deliveries. However, the water supply base case would not be appropriate for the environmental analysis because the Bay-Delta environment never experienced this level of exports.

Comment: [Page VIII-1, para. 3] The 1984-1992 reference period used for the environmental analysis is totally inappropriate. It is not representative of conditions on the San Joaquin River. The reference period has six critical years in a row, and the one wet year was a subnormal snow melt year where most of the runoff occurred in one month. The stated purpose for using this reference period, instead of the 1922-1992 period used for the hydrological analysis, is because the Bay-Delta never actually experienced those modeled conditions. The Bay-Delta environment never actually experienced the conditions of the preferred alternative to which the base case is being compared. It is never appropriate to evaluate an alternative by comparing modeled values with observed values; modeled results should always be compared with modeled results. (SJTA-2)

Response: The reference condition for an environmental analysis should always reflect actual conditions experienced by the environment, not modeled conditions. The recent historical period of 1984-1992 was chosen for the environmental analysis because it contains enough years to capture some of the biological and hydrological variability in the Estuary, including the extended drought of 1987 through 1992. For some parameters, such as exports, in the analysis, modeled conditions of the preferred alternative are compared to actual historical operations because, in these cases, the models used are the only available tools to predict conditions under the preferred alternative for the environmental analysis. The modeled-historical data comparisons are necessary for this purpose, albeit results must be interpreted with care and full consideration of the modeled conditions. Even for the case of exports, however, actual conditions were compared to the standards to illustrate how project operations would be changed under the plan.

A. Effects in the Estuary

Comment: [Page VIII-2, 2nd full para., Pages VIII-3 and VIII-4] References in the Delta Outflow section to the "G model" developed by the CCWD are misleading. A more accurate reference would be to the CCWD's additional outflow model, which was based on the G model. (JCWU-1)

Response: The text in this chapter and in Chapter VII has been changed to reflect the comment.

Comment: [Figures VIII-7 through VIII-10] The figures define exports as combined pumping from Banks, Tracy, and Contra Costa pumping plants. To be consistent with the Principles for Agreement, exports should apply to diversions from Tracy and Banks only. (JCWU-1)

Response: Since export limits in the plan are applicable to Banks and Tracy exports only, these figures should consider only these two components, and not diversions by the CCWD, North Bay, and City of Vallejo. Figures VIII-7 through VIII-10 and the discussion in the Delta Outflow section have been revised accordingly. Additionally, language has been

inserted in the Delta Exports section to clarify the definition of the term "exports" as used in the environmental impact analysis of Chapter VIII.

Comment: [Page VIII-9, last para.] There is a discussion of the projected need for additional flows to meet the salinity standards at Vernalis. It is not clear whether the analysis of the average historical EC at Vernalis from 1984 through 1992 considers the quantity of water released from New Melones to create the average historical EC used. (SEWD-2)

Response: The discussion compares salinity at Vernalis from 1984 to 1992 with the objectives at Vernalis. The USBR operated New Melones during this period to achieve the salinity objective of 500 parts per million total dissolved solids at Vernalis, when feasible. The text has been amended to clarify this point.

Comment: The following comments deal with compliance with salinity objectives in the south and central Delta.

1. We are concerned about the potential impacts of Delta Cross Channel closures and increased San Joaquin River flows on water quality in the central Delta. It is likely that these actions in combination will result in San Joaquin River water quality, which is grossly impacted by San Joaquin Valley drainage, adversely impacting water quality in some channels of the central Delta. Operation studies conducted to test the different Bay-Delta scenarios under consideration did not include resulting water quality at measuring stations within the central Delta. The draft environmental report and the SWRCB deliberations on the draft plan cannot be complete without such information for all months. (CDWA-1)
2. The discussion of the modeling assumptions contained on page VII-4 clearly acknowledges that full compliance with the southern Delta agricultural requirements (through fresh water releases from upstream projects) has not been evaluated. (SFPUC-2)
3. On page VIII-9, there is a description of how the flow objectives will result in a failure to meet salinity standards at Vernalis. The environmental report should examine how alterations in the flow objectives may impact this problem, unless it is assumed that the fish and wildlife objectives are more important beneficial uses than the agricultural ones. This issue cannot be put off as suggested on page VIII-50 because the plan requires the USBR to meet these objectives during the next three years. (SDWA-2)
4. Meeting the Prisoners Point standard under the plan may not be possible. Although Prisoners Point is upstream from the mouth of the Mokelumne River, the transfer of water through the central Delta to the export pumps has historically kept salinity below the 0.44 mmhos/cm EC objective. With the Delta Cross Channel closed and

export restricted, water quality in the Prisoners Point vicinity may reflect saltier San Joaquin River conditions instead of Mokelumne River conditions. This may be particularly true in two instances: (1) in April and May, outside the pulse flow period, when the San Joaquin River is managed to meet the 0.7 mmhos/cm EC agricultural standards; and (2) during the April 15-May 15 period when exports are restricted to an amount equal to 100 percent of the San Joaquin River flow at Vernalis, especially without the Old River barrier in place. (SJTA-2)

5. The draft environmental report states in Chapter VI that DWRSIM is not capable of analyzing the water supply impacts of water quality objectives for the interior stations in the southern Delta. Not only are the impacts of the preferred alternative speculative, not only do they use the CVP and SWP as surrogates, but even the models used are not capable of analyzing water supply impacts in critical areas of the Delta relating to the San Joaquin River. Water quality objectives should not be adopted when the impact of those objectives are not capable of being measured. (SEWD-2)

Response: The discussion on page VIII-9 of the draft environmental report compares historical salinity at Vernalis to the standards in the plan. This analysis shows that in some dry and critical years, compliance with the standards would require improvement in historical salinity conditions at Vernalis.

At the request of the SWRCB staff, the DWR analyzed the effect of the objectives on Delta salinity. The DWR Delta Simulation Model was used to estimate monthly average salinity for the period from water year 1987 through water year 1992 at ten stations in the Delta. Discussion of this analysis has been incorporated into Chapter VIII of the environmental report. A brief summary follows.

Under the standards in the plan, salinity at central Delta stations (Jersey Point, San Andrea, and Prisoners Point) increase significantly during the November through January period when the Delta Cross Channel is closed the first half of each month. The increase persists into February when the Delta Cross Channel is closed continuously. The Terminous station shows similar increases but tends to lag by one month. Spring and summer salinity at Jersey Point, San Andrea, Prisoners Point, and Terminous is lower under the plan. The agricultural water quality standards are satisfied within the bounds of model accuracy for the central and northern Delta stations. Standards in the southern Delta are often exceeded, however, because DWRSIM was run using a 70 TAF cap on flows released to the San Joaquin River for water quality purposes. As a result, standard exceedences occur in dry and critical years during the April through August period when the standard is 0.7 mmhos/cm. Southern Delta water quality is only marginally affected by Delta Cross Channel operation. Most salinity differences in the southern Delta between the plan and the base hydrology are due to temporal differences in inflow and export magnitudes.

The draft plan does not envision that the salinity objectives in the south Delta will be achieved exclusively through freshwater releases; implementation of the objectives will be achieved through a combination of release of adequate flows and control of saline drainage. Therefore, full compliance through release of fresh water has not been evaluated.

As discussed elsewhere in this Response to Comments, the draft plan has been amended to state that the USBR intends to try to meet the flow objectives at Vernalis, as required in the biological opinion for Delta smelt, through releases from New Melones. The plan does not require the USBR to meet these flows.

Comment: [Page VIII-15] The discussion indicates that the plan is intended to benefit many levels of the aquatic ecosystem of the Bay-Delta, so that conditions are improved for a broad range of species utilizing the system. The discussion should acknowledge, however, that not all species will receive the same level of protection, and should include a statement that potential adverse impacts on upstream fisheries resources will need to be assessed based on the results of monitoring. (JCWU-1)

Response: The text has been revised to incorporate the comment.

Comment: [Page VIII-20, last para., 4th sentence] The subject sentence states that the derivation of the recommended flows is not based on the results of habitat or population studies, rather on scientific judgement. This statement is an example of how these proposed standards are lacking in sound scientific analysis and are without any scientific or biological justification. (SJTA-2)

Response: The objectives require minimum Delta outflow in July and August. The justification for the increased outflows include: (1) general improved habitat conditions; (2) transport of eggs and larvae out of the river and Delta areas and dispersal into downstream estuarine habitats; and (3) nutrient transport into Suisun and Honker bays resulting in increased phytoplankton production. Some of the proposed standards are developed without experimental data to support the specific standard because no such data are available. These objectives are developed based on the judgement of a number of participants in the SWRCB's proceedings.

The plan calls for a monitoring and special studies program which will provide more information on the factors affecting aquatic habitat in the Delta, as well as feedback on the effectiveness of the proposed standards. At the end of three years, the standards in the plan will be reviewed and modified, if necessary.

Comment: [Page VIII-32] Station "S-75" should be labeled "S-35" in the table of compliance monitoring stations. (DWR-2)

Response: The correction has been made.

Comment: [Page VIII-32, para. 2] The draft environmental report indicates that the subsequent discussion of the environmental effects of the standards on Suisun Marsh is divided into four sections: background, proposed standards, salinity conditions, and Suisun Marsh biota. There is no section describing impacts of the plan on Suisun Marsh. (DWR-2)

Response: The draft environmental report has been revised to reflect that three sections (background, proposed standards, and salinity conditions) are discussed. A discussion of threatened and endangered Suisun Marsh biota is provided in Chapter XIII.

Comment: [Page VIII-33, Figure VIII-32] Station S-35 is incorrectly located on the map. (DWR-2)

Response: The correction has been made.

Comment: [Page VIII-34, 1st full para.] The last sentence states that the DWR and the USBR are still developing a program to consistently achieve the 1978 Delta Plan western marsh standards, and they have not yet met the western marsh standards during the deficiency periods defined in the SMPA. This sentence should be revised to reflect that the 1978 Delta Plan western marsh standards were not in effect. (DWR-2)

Response: The sentence has been clarified, as requested.

Comment: [Page VIII-34, para. 4, 1st sentence] The sentence states that in 1987 the DWR requested that the water quality objectives in the SMPA be adopted as the marsh standards. The first line of the fifth paragraph on page VIII-34 states that the same request was made again by the DWR during the SWRCB's current proceeding. The subject requests were made, not only by the DWR, but also by the USBR, DFG, and SRCD. (DWR-2)

Response: The correction has been made.

Comment: [Page VIII-34, para. 4, last sentence] The sentence states that the DWR and the USBR plan to complete a Suisun Marsh Biological Assessment in 1996. This biological assessment is no longer relevant. Portions of the study that are relevant were submitted to the SWRCB in December 1994. The major remaining elements of the study plan no longer reflect current water management of the Estuary. The SWRCB has called for a Suisun Marsh Ecological Work Group to evaluate beneficial uses and water quality objectives for the Suisun Marsh ecosystem. This work group is the appropriate forum for future evaluations of water quality standards in Suisun Marsh. (DWR-2)

Response: The sentence has been amended to reflect the comment.

Comment: [Page VIII-35, para. 2, 7th sentence] The sentence states that there should be a natural gradient of increasing salinity from east to west which is not reflected in the existing standards but is included in this proposal. This should be revised to read: "Also there

should be a natural gradient of increasing salinity from east to west which is not reflected in the existing standards, but is included in this proposal when deficiency period standards are in effect." (DWR-2)

Response: The recommended clarification has been made.

Comment: [Page VIII-36, first para.] The Suisun Marsh Biological Assessment study plan approved by SWRCB staff addressed implementation of SMPA standards throughout Suisun Marsh under D-1485 hydrologic conditions. If a biological assessment is needed for future standards proposed by the Suisun Marsh Ecological Work Group, a new study plan will be necessary. (DWR-2)

Response: The discussion has been amended to state that, since the Suisun Marsh Biological Assessment study plan addresses implementation of SMPA standards under D-1485 conditions, a new study plan may be necessary for future standards.

Comment: [Page VIII-36, para. 3] A sentence should be inserted at the end of the paragraph stating that creek flows into northwestern Suisun Marsh are regulated by the management of reservoirs on Green Valley and Suisun Creek watersheds and are affected by urban development in the area. (DWR-2)

Response: The recommended language has been inserted.

Comment: [Page VIII-37, 1st full para.] The following sentence should be added at the end of this paragraph.

"Salinity in northwestern Marsh sloughs (e.g., S-97) is primarily affected by surface water inflows from local creeks and drainage water from the managed wetlands; and is relatively unaffected by Delta outflow and Suisun Marsh Salinity Control Gates operations." (DWR-2)

Response: The statement has been added to this paragraph that salinity in northwestern Marsh sloughs is relatively unaffected by Suisun Marsh Salinity Control Gate operation. The statement regarding Delta outflow has not been added because Delta outflow affects salinity in this area.

Comment: [Page VIII-37, last para.] The statement in this paragraph that the principal environmental concern regarding the marsh is conversion of existing brackish marsh to salt marsh should be augmented by the statement that fish and wildlife agencies have also expressed concern about conversion of brackish marsh to freshwater marsh in efforts to meet internal Suisun Marsh standards. (DWR-2)

Response: The recommended statement has been inserted.

Comment: The Old River Barrier should be discussed in Chapter VIII and V. (SFPUC-1)

Response: The Old River Barrier is recommended by the SWRCB in the water quality control plan, but it is not a water quality objective and is not discussed in detail. The effect of the Old River barrier on salmon smolt survival is discussed in section A.4.b of Chapter VIII and section E of Chapter VI.

Comment: [Page VIII-50, 1st full para.] The draft environmental report states that increased flows may reduce the capacity to provide dilution water from New Melones for salinity control purposes at Vernalis, as required by D-1422, depending on how the responsibility to meet the fish and wildlife objectives are allocated. This conclusion is minimized for two reasons: (1) for the interim period, this will certainly happen because New Melones will provide all flows required, as provided in the plan; and (2) the artificial 70 TAF cap is unwarranted. (SEWD-2)

Response: The SWRCB is not requiring the USBR to meet the flow objectives prior to adoption of a water right decision. This requirement is being imposed by the USFWS under the authority of the federal ESA. The USBR is likely to meet these flow requirements through releases from New Melones Reservoir. The 70 TAF cap is warranted because the SWRCB believes that salinity control measures will reduce the need for releases of dilution water from New Melones. During the water rights phase, the SWRCB will consider both the responsibility and the capacity of individual water right holders to meet the objectives.

B. Effects in Upstream Areas

Comment: [Page VIII-50] Why does the draft environmental report analyze the impacts of the objectives based upon an assumed allocation if the SWRCB is delaying the issue of flow allocation until the water rights phase? (SJTA-2)

Response: The draft environmental report analyzes these effects in only a general, programmatic fashion, for the purpose of analyzing the potential effects of adopting these objectives at the earliest possible point in the proceedings. Additional analysis will be provided in connection with the water rights phase when the exact implementation actions are known.

Comment: [Page VIII-51, para. 4] The term "upstream area" is defined as the Sacramento Valley and the eastside San Joaquin Valley. The definition excludes the Friant service area, the San Joaquin River exchange contractors, and others who use the waters of the San Joaquin River. If the SWRCB insists on including the upstream areas in its analysis of the impacts of the plan, then it must include all users, not just select groups. (SJTA-2)

Response: The term "upstream area" is broadly defined in the environmental report and is meant to include all users of San Joaquin and Sacramento river water before it enters the Delta. It is not the intent of the SWRCB to infer in the environmental report distribution or

exclusion of water supply impacts to any party. The discussion of impacts is meant to be of a general nature, encompassing upstream, in-Delta, and export area impacts.

Comment: [Page VIII-51, last para.] Why isn't Friant Reservoir included as part of the San Joaquin Valley storage? The operation of this reservoir results in 2.75 to 3.0 MAF of Delta depletion. Impacts of providing exchange contract water (about 1 MAF) extends from the Delta upstream to the upper Sacramento, American, and Trinity rivers. The Stanislaus River will be impacted by the operation of New Melones Reservoir as it is manipulated to provide water to the southern Delta and lower San Joaquin River in an effort to support fish habitat beneficial uses and water for export. (SARA-1)

Response: In the water supply impact analysis and in DWRSIM modeling, it was assumed that all water in the San Joaquin River Basin necessary to meet the requirements of the plan would be released from New Melones. Thus, the impact on storage in New Melones represents the overall modeled storage impact for the San Joaquin River Basin, including any impact that would be attributable to Friant under real operation. The actual responsibility to meet the objectives will be established during the water rights phase.

Comment: The impacts to tributary systems and their resources, uses, and values are not identified. The Bay-Delta and the rivers are an integral part of the same system, and the Bay-Delta cannot be separated from its tributary ecosystems without impacts that will spread throughout the entire system. (SARA-1)

Response: The impacts to tributary systems are dependent on the water allocation decision that will be made during the water rights phase of the proceedings. At that time an appropriate environmental document will be prepared that analyzes the effect on tributary systems of the allocation decision.

Comment: Tributary flow regimes needed to conserve, restore, and protect fish resources are not identified. The Delta and the public trust will suffer until all streams contribute their fair share of the water required to meet environmental needs. (SARA-1)

Response: The draft plan establishes flow requirements and operational restrictions in the Bay-Delta necessary to achieve reasonable protection for all of the uses of Bay-Delta waters. Tributary flow regimes are not a subject of this draft plan.

Comment: [Page VIII-52, last two para.] According to the environmental report, there are no Sacramento River impacts because the required flows are similar to the base flows. For the San Joaquin River, the Vernalis flow requirements result in substantial impacts to San Joaquin River flows. In fact, under current conditions, the proposed standards could not be met even in wet years. (SJTA-2)

Response: The purpose of the plan is to establish water quality control measures which contribute to the protection of beneficial uses in the Estuary. Thus, the plan establishes

reasonable controls on factors which have been identified as likely contributors to the declines in aquatic resources, including low San Joaquin River flows. The SWRCB agrees that the flow objectives on the San Joaquin River can cause substantial impacts in some years. However, the statement that the flow objectives cannot be met even in wet years is incorrect. The objectives will be met this year by unregulated flow.

Comment: [Page VIII-58, para. 1] Regarding the release of the 28 TAF pulse flow in October, we believe the analysis in the draft environmental report to be in error concerning the lack of a requirement to provide the pulse flow in any year in the reference period. It appears from the data illustrated in Figure VIII-51 that the full 28 TAF of additional release would have been required in at least some of the years. If we have correctly interpreted the proposed standards, the 28 TAF pulse is required to provide a 2,000 cfs monthly flow at Vernalis. (SFPUC-2)

Response: The 28 TAF is required, as necessary to bring flows in the San Joaquin River up to a monthly average of 2,000 cfs in October, except for a critical year following a critical year. Under the San Joaquin River Basin hydrologic classification, water years 1987 through 1992 are designated as critical. From 1988 through 1992, October flows were less than 2,000 cfs. However, the 28 TAF was not required in any of these years because each of these critical years follows a critical year.

Comment: [Page VIII-58, para. 2] The draft environmental report states that water users in upstream areas will be required to contribute an unknown amount of water to meet the Bay-Delta standards. The draft report then refers the reader to Chapter XII for a quantitative assumption regarding the allocation of water supply impacts in the eastside San Joaquin Valley. Chapter XII has no discussion. There is no explanation of the methods used by the SWRCB to allocate responsibility among the upstream users. We are left to speculate as to how the SWRCB may have assigned responsibility.

Response: The sentence that refers the reader to Chapter XII for a quantitative assumption regarding the allocation of water supply impacts has been deleted. The methodology for allocating water supply impacts in the eastside San Joaquin Valley is described below. The methodology was developed in order to conduct an economic analysis. No inference should be made regarding allocation of responsibility in the water right proceeding based on this methodology.

The additional water above base flows required by the objectives on the San Joaquin River was divided among the three tributaries based on the percentage of the unimpaired flow originating from each of the tributaries (Stanislaus - 28.2%, Tuolumne - 47.2%, and Merced - 24.6%). Water right holders with storage capacity in the basin in excess of 100 TAF were then assigned responsibility for flows in each tributary based on their percentage of the storage capacity in the tributary. The responsibility of the City of San Francisco was then removed and assigned to the other water right holders in the basin based on the percentage of their responsibility before the City of San Francisco was removed. The City

of San Francisco's responsibility was removed because it was assumed that high value urban water would be replaced by water purchases within the basin. The following table lists the final percent allocations.

| Tributary | Owner | Reservoir | Capacity (acre-feet) | Responsibility (including SF) | Responsibility (excluding SF) |
|---------------------|--------------------------|---------------|-------------------------|----------------------------------|----------------------------------|
| Stanislaus 28.2% | Calaveras Co. | Spicer Mdws | 184,300 | 0.0183 | 0.0206 |
| | Oakdale & San Joaquin | Donnels Lake | 64,700 | 0.0064 | 0.0072 |
| | | Tulloch | 68,400 | 0.0068 | 0.0077 |
| | | Beardsley | 98,500 | 0.0098 | 0.0110 |
| | PG&E | Strawberry | 18,300 | 0.0018 | 0.0020 |
| USBR | New Melones | 2,400,000 | 0.2388 | 0.2689 | |
| Subtotal | | | 2,834,200 | 0.282 | 0.318 |
| Tuolumne 47.2% | TID/MID | New Don Pedro | 2,030,000 | 0.3475 | 0.3913 |
| | | Turlock lake | 45,000 | | |
| | | Modesto lake | 28,000 | 0.0077 | 0.0087 |
| | San Francisco | Lake Lloyd | 268,000 | 0.0048 | 0.0054 |
| | | Hetch Hetchy | 360,400 | 0.0459 | 0 |
| | | Lake Eleanor | 26,100 | 0.0617 | 0 |
| | | | 0.0045 | 0 | |
| Subtotal | | | 2,757,500 | 0.472 | 0.405 |
| Merced 24.6 % | Merced I.D. | Lake McClure | 1,024,000 | 0.2460 | 0.2770 |
| Subtotal | | | 1,024,000 | 0.246 | 0.277 |
| Total | | | 6,615,700 | 1 | 1 |

Comment: [Page VIII-58, para.3] The draft environmental report states that if the SWRCB requires upstream water users to provide some of the water necessary to meet these new standards, both crop shifts and land retirement are likely. This conclusion is minimized for two reasons: (1) the plan provides that upstream water users will provide all the water necessary to meet the San Joaquin River flow objectives in the interim period; and (2) the impact on groundwater overdraft is not discussed. (SEWD-2)

Response: The SWRCB is not requiring the USBR to meet the flow objectives prior to adoption of a water right decision. This requirement is being imposed by the USFWS under the authority of the federal ESA. The USBR is likely to meet these flow requirements through releases from New Melones Reservoir. The impact of groundwater overdraft is discussed in section C of Chapter VIII (Effects in Export Areas). The text in section B of Chapter VIII (Effects in Upstream Areas) has been augmented with the statement that similar groundwater effects are expected in upstream areas if water supplies are curtailed in these areas.

Comment: [Page VIII-61, 1st full para.] The draft environmental report states that reservoir levels are likely to decline, but the impacts cannot be determined because reservoir levels will be dependent upon management decisions made by reservoir operators, i.e. reducing storage in reservoirs or limiting deliveries to customers. This lack of analysis merely masks the fact that if upstream areas have to make substantial flow contributions, recreation will be significantly affected. (SJTA-2)

Response: Management decisions by reservoir operators are primary factors affecting actual operation of reservoirs. The objectives do not address these management decisions and there is no way to quantifiably predict them. Therefore, there is no means by which these decisions can be foreseen; analysis of their impacts is not feasible at this time. In DWRSIM, reservoir operations are simulated over the 71-year hydrology, representing the best available method of analyzing the water supply impacts of the plan. The draft environmental report recognizes, in the same paragraph cited by the commenter, that "lower reservoir levels can have a significant impact on recreational activities".

Comment: [Page VIII-62] There is concern expressed about pumping groundwater and its resultant problems. Overdrafting the groundwater and requesting a supplemental surface water supply is a common tactic used by water agencies to justify more water development. (SARA-1)

Response: The purpose of this discussion is to identify the probable response of water users to a reduction in surface water supplies. The SWRCB believes that increased reliance on groundwater is a probable response.

Comment: [Page VIII-63] As Table VIII-4 illustrates, the preferred alternative will exacerbate the current groundwater overdraft situation in the San Joaquin Valley. Reduced surface water supplies will probably be replaced with groundwater, where available, and the overdraft will increase the magnitude of the water supply impact. The discussion of water supply impacts should also state that groundwater overdraft will increase significantly under the preferred alternative. (SJTA-2)

Response: The discussion in Chapter VIII states that the worst case estimate of increased groundwater pumping in the short-term is that all of the reduced surface water supplies from the Delta will be replaced by increased groundwater pumping. This short-term increase is an

environmental effect that occurs because water users are replacing lost surface water supplies in order to decrease the magnitude of the water supply impact. Therefore, the groundwater overdraft belongs in the environmental effects section of the report, not the water supply impact section.

C. Effects in Upstream Areas

Comment: [Page VIII-62, 3rd full para, last sentence] The draft environmental report states that the average amount of groundwater overdraft in California is about 1.0 MAF per year (based on a draft version of Bulletin 160-93). In the final Bulletin 160-93, the amount was revised to 1.3 MAF per year. (DWR-2)

Response: The correction has been made, and the citation to the draft Bulletin 160-93 has been updated to the final Bulletin 160-93.

Comment: [Page VIII-65, 1st partial sentence] The draft environmental report states that "...but the majority of the reductions would be borne by export areas if the CVP and the SWP are largely responsible for meeting the standards". This statement is inaccurate. On an interim basis, the draft plan requires that all reductions be borne by upstream users Stockton East Water District and Central San Joaquin Water Conservation District for the San Joaquin River flows. In addition, this statement fails to acknowledge that there are area of origin users who are CVP and SWP contractors. (SEWD-2)

Response: As discussed elsewhere in this document, the plan does not allocate responsibility to meet the requirements. Responsibility will be determined in the water rights proceeding following adoption of the plan. The biological opinion for Delta smelt requires that the USBR meet San Joaquin River flow requirements.

The statement has been amended to state that, if the CVP and the SWP are held largely responsible for meeting the standards, the majority of the reductions would be borne by the projects' contractors.

E. Irreversible or Irretrievable Commitment of Resources

Comment: [Page VIII-73] The text in this section identifies certain irreversible commitments of resources, but does not indicate why these commitments are justified. The following language is suggested to address this point. (JCWU-1)

These commitments of resources are justified in light of the enhanced protection that the plan will provide to aquatic habitat-related beneficial uses in the Estuary. If the plan had not been adopted and implemented, there may be further declines in fresh- and brackish-water aquatic and terrestrial habitats in the Delta, resulting in the potential listing of additional species under the federal and State ESAs.

Response: The recommended clarification has been added to this section.

F. Growth-Inducing Effects

Comment: [Page VIII-73, last para., 1st sentence] The opening sentence of this section references potential impacts to areas served by the CVP and the SWP. If the proposed standards are met also by entities other than the two projects, those areas could also experience similar impacts. The draft environmental report should be revised to broaden the areas of potential impacts beyond the CVP and SWP service areas. (SFPUC-2)

Response: The sentence has been revised to state that the standards will reduce the amount of water available to water users in areas served by the CVP, the SWP, and other parties charged by the SWRCB in the upcoming water rights proceeding with responsibility for meeting the requirements of the plan.

I. Cumulative Impacts

Comment: [Page VIII-77, 1st full para., 2nd sentence] The sentence states that requirements under the federal ESA are not incorporated into the base case analysis. This is inconsistent with the base case assumptions on page VII-4 which indicated that the base case for this analysis is D-1485 conditions, modified to account for upstream requirements on the Sacramento River imposed by the NMFS to protect winter-run chinook salmon. (SEWD-2)

Response: The base case is D-1485 conditions, modified to account for upstream requirements on the Sacramento River imposed by the NMFS to protect winter-run chinook salmon. However, this section has been completely rewritten and the base case discussion is no longer included.

Comment: [Page VIII-78, last para.] Reference "MWD 1993" is listed in the literature cited section of Chapter VIII as testimony from the D-1631 proceedings. This citation is a typographical error and should be changed to "D-1630". (JCWU)

Response: The cited reference refers to MWD testimony during the proceedings of Mono Lake Water Right Decision 1631. The reference to D-1631 is correct.

Comment: [Page VIII-75 to VIII-79] The following comments were received concerning additional cumulative impacts not discussed in the draft environmental report.

1. The cumulative impacts section should include the current FERC proceeding for the lower Tuolumne River. The Plan and the FERC proceeding could have significant individual and collective water supply ramifications to non-project entities. (SFPUC-2)

2. This cumulative impacts section should include a discussion of pending FERC decisions on the Mokelumne and Tuolumne rivers and the pending SWRCB water right decision on the Yuba River. (SJTA-2)

Response: The FERC proceedings and other SWRCB water right proceedings, in combination with implementation of the plan, could have a cumulative impact on some projects in the Central Valley. Therefore, these proceedings are added to the environmental report.

CHAPTER IX. RECOMMENDATIONS TO OTHER AGENCIES

(All comments regarding recommendations to other agencies are included in Part I of this Response to Comments.)

CHAPTER X. MITIGATION AND UNAVOIDABLE SIGNIFICANT IMPACTS

Comment: The draft environmental report identifies various impacts of the draft plan and lists mitigation measures or other recommendations that have been identified to address these impacts. The document would convey this information more effectively if the information regarding impacts and mitigation measures were consolidated and provided in summary form. It would be helpful if Chapter X contained a table summarizing the following: (1) each potentially significant impact of the plan; (2) mitigation measures, if any; and (3) whether the impact would remain significant if the mitigation measures were implemented. (JCWU-1)

Response: Chapter XIV provides a summary of significant impacts. Chapter X is dedicated to mitigation measures. The range of possible mitigation measures are summarized in the introduction to Chapter X, and a more detailed discussion is provided in the subsequent text. As mentioned at the end of Chapter X, the SWRCB does not believe that the significant impacts, all of which are associated with reduced water supplies from the Delta, can be fully mitigated by the mitigation measures. The significant impacts are unavoidable. A table in Chapter X summarizing this information is unnecessary. The resolution adopting the plan will contain a summary of the information requested by the commenter.

Comment: [Page X-1, para. 1, 2nd sentence] The statement that mitigation measures under the SWRCB's regulatory authority cannot be imposed until a water right decision is made that implements the plan is an acknowledged deficiency in the environmental documentation. The SWRCB should complete the water right decision before adopting any water quality control plan, at least a plan which the USBR and other federal agencies can and will use to take away Westlands Water District Area I's water rights. (WWD AREA1-1, SEWD-2)

Response: This water quality control plan establishes objectives and a program of implementation. In accordance with Water Code section 13241, the program of implementation describes the nature of the actions which are needed to achieve the objectives, sets time schedules for actions, and describes the surveillance that will be needed

to determine compliance with the objectives. It does not, however, establish the enforceable requirements that will implement the objectives. Consequently, adoption of this plan will not have an immediate impact on the environment. Because further actions will be necessary before any impact occurs, mitigation measures are not required until this plan is implemented.

The commenter's contention that the SWRCB should complete the water right decision before adopting this plan is contrary to the guidance provided to the SWRCB by the Court of Appeal in United States v. State Water Resources Control Board (1986) 182 Cal.App.3d 82, 227 Cal.Rptr. 161, 180. The Court of Appeal stated that the SWRCB's 1978 actions combining its water rights and water quality proceedings for the Delta resulted in defects in the water quality objectives. These defects were caused when the SWRCB established objectives that protected Delta water quality only against the effects of the CVP and the SWP. As the Court of Appeal pointed out, the SWRCB is obligated to provide reasonable protection for the beneficial uses taking into account all competing demands for the water. Establishment of the objectives first, followed by implementation actions in a water right decision, avoids the defects cited by the court.

A. Conservation

Comment: [Page X-3] The discussion of agricultural water conservation should acknowledge that there are some agricultural districts in the State which do not benefit from all of the agricultural water conservation practices listed. Some districts practicing conjunctive use methods for recharging overdrafted groundwater basins with surface water discourage some of the listed actions such as lining of canals and mechanisms to decrease surface water use. (SEWD-2)

Response: The discussion and recommendations regarding agricultural water conservation in the environmental report are not intended to take precedence over planned conjunctive use programs. A sentence has been added to the recommendations in this section to clarify this intent.

There are some water districts in the State that encourage conjunctive use in agricultural areas. For example, during the SWRCB's draft D-1630 proceedings, the Madera Irrigation District testified that it uses imported water from the Fresno River and the upper San Joaquin River for direct crop irrigation and for percolation to the groundwater basin through natural channels and unlined distribution systems during periods when water availability exceeds demands. (WRINT-MAD-6,3) The problem with this approach is that such a program can result in inefficient use of water supplies during periods of critical need for other water users and for public trust resources unless the conjunctive use program is carefully planned.

Comment: Delta levee maintenance is critical to fresh water conservation in the Delta. Previous and current studies show that evaporation from flooded surfaces in the Delta uses

approximately two acre-feet per flooded acre more than if the same acre was farmed.
(CDWA-1)

Response: There is no question that the existing Delta configuration, including levees, is critical for ensuring the continued capacity to export in the southern Delta. However, this chapter discusses additional activities that can be undertaken to mitigate for the loss of supplies from the Delta, not existing maintenance activities.

C. Water Transfers

Comment: [Page X-7] The discussion of water transfers should acknowledge that this solution is not available on a statewide basis. There are regions of the State which are physically isolated from water conveyance facilities and which cannot readily avail themselves of this mitigation measure. (SEWD-2)

Response: A sentence has been added to this section acknowledging that water transfers are not available on a statewide basis.

Comment: The discussion of water transfers fails to recognize that, though authorized under various statutes, most such transfers would still require a permit hearing to determine the impacts of the transfer on other water right holders. This becomes very important if the proposed transfer decreases return flow to the waterway. (SDWA-2)

Response: The discussion of water transfers notes that most transfers require SWRCB approval, and that this approval is dependent on either CEQA compliance for long-term transfers or a finding of no injury to any other legal user of water for short-term transfers.

D. Reclamation

Comment: [Page X-8] The draft environmental report urges all water users to maximize their production and use of reclaimed water. However, there have been concerns raised by and before the Delta Protection Commission that the Delta is an inappropriate location for release of treated wastewater. The Commission's adopted Plan includes a policy prohibiting deposition of wastewater or biosolids in the Primary Zone of the Delta. (DPC-1)

Response: The purpose of the recommendation is to encourage adequate consideration of reclamation projects. The SWRCB recognizes that reclamation may not be an appropriate option under all circumstances.

E. Mitigation Fund

Comment: [Page X-9] The Principles for Agreement calls for a financial commitment of roughly \$60 million annually. Currently, there are a number of State and federal programs and funding mechanisms, such as the CVPIA's Restoration Fund that are focused on

protecting many of the same fish species and habitat as the draft plan. Before the SWRCB levies any new user fees or financial commitments upon anyone, the SWRCB should undertake an exhaustive review of current programs to determine if existing funds or programs could be redirected. (NCWA-1)

Response: The SWRCB presently has no plans to levy fees on water users in the Central Valley to fund the non-flow measures established in the Principles for Agreement. The environmental report recommends that the water users develop a legislative proposal to authorize a mitigation fund for the Delta. If such a proposal is developed, a review of current resources is likely to occur to ensure that the mitigation fund is necessary.

G. Offstream Storage Projects

Comment: [Page X-10] To provide a more consistent description of the status of the Los Vaqueros Project, we suggest substituting the last sentence in the discussion with the following: "The Los Vaqueros Reservoir Project, which will be used to improve water quality in the CCWD and provide emergency storage, has received all necessary environmental and water rights permits and currently is under construction. (JCWU-1)

Response: The text has been revised accordingly.

Comment: Delta Wetlands should be included in the environmental report as a major offstream storage project under consideration. (DELTAWET-1,2)

Response: Delta Wetlands is a major offstream storage project under consideration, and the project has been added to the environmental report.

Comment: CCRC Farms and Tuscany Research Institute, coapplicants to appropriate water in the Delta at Mandeville Island, join in the comments of Delta Wetlands and submit that their project at Mandeville Island should also be included in the environmental report as another project which can improve water supply reliability by providing offstream storage. (GALLERY-1)

Response: The Mandeville Island project is a major offstream project for which an application to appropriate water has been filed, and the project has been added to the environmental report.

Comment: We believe that the draft plan, in conjunction with other initiatives, establishes a minimum level of interim protection for biological resources under current conditions of storage and withdrawal capacity in the Bay-Delta system. Any significant changes in the ability to store or divert water from the Estuary, such as construction of the proposed Los Banos Grandes Reservoir, would necessitate review and revision of the requirements of the draft plan. Such changes should be considered under the identification and analysis of alternatives in the long-term process discussed in section J. (BISF-3)

Response: The long-term planning process is in the early stages of development, and the scope of the planning process is not yet known. However, the principal focus of the process will be to develop solutions to the Delta problems. A recommendation from the SWRCB at this time to expand the process to include consideration of offstream projects would be inappropriate.

The environmental report in support of the draft plan analyzed the impact of (1) projected CVP and SWP operations in the Delta with existing demands and storage facilities and (2) the impact of water transfers through the CVP and SWP facilities from July through October under the proposed objectives and current conditions of storage and withdrawal. Substantial changes in the modeled conditions may necessitate a review of the objectives during the triennial review process.

Comment: Since we are talking about limiting diversions in order to increase flows for beneficial purposes, we should also consider increasing storage to allow more flow and to allow an easier and more humane balancing of these interests. (Transcript-BFC)

Response: The SWRCB recognizes that enhanced water supply reliability in the future can be achieved, in part, by additional offstream storage. In Chapter X of the environmental report, the SWRCB encourages the DWR to evaluate the feasibility of the Los Banos Grandes project under the new regulatory conditions imposed by the plan and the MWD to move forward with its planned construction of Domenigoni Valley Reservoir.

I. Purchase of Delta Islands

Comment: The draft environmental report recommends an evaluation of the feasibility of purchasing Delta Islands and converting the land use to some function that would minimize subsidence and reduce water use. This issue should be addressed in more detail and should include a thorough discussion of the current scientific research on subsidence of peat soils, a definition of what peat soils would be subject to retirement, a range of options for private ownership and management, and an evaluation of the water to be available as a result of any acquisition. The long-term protection of the island levees carries a substantial, permanent financial responsibility, and any acquisition analysis should include evaluation of financial impacts. (DPC-1)

Response: The purpose of the recommendation to evaluate the feasibility of purchasing Delta Islands is to collect the information identified by the commenter.

XI. ANALYSIS OF ALTERNATIVE STANDARDS

A. Description of Alternatives

Comment: It may be useful if Chapter XI includes a brief description and analysis of a "no action" alternative. Because the environmental report is not required to meet the formal

requirements of an EIR, it technically is not required to analyze the consequences of a "no action" alternative. Nevertheless, a discussion of a "no action" alternative would provide further justification for the plan and would help to clarify for the public why that alternative is unacceptable. (JCWU-1)

Response: For the purpose of comparing the alternatives in Chapter XI, the "no action" alternative is assumed to be the base case used for the water supply impact analysis in Chapter VII. Thus, in discussing the alternatives' impacts on water supply and aquatic resources, references to the base case are also applicable to the "no action" alternative. For clarification, additional description of the base case or "no action" alternative has been included in section A of Chapter XI.

Comments: [Page XI-1] The SWRCB only included complete regulatory alternatives and did not evaluate the SJTA proposal for the San Joaquin River, which requires far less water and provides significant equivalent benefits to the salmon fishery. (SJTA-1)

Response: There are a very large number of alternatives and combinations of alternatives that the SWRCB could have evaluated. The alternatives evaluated were selected because they represent a broad range of both benefits and water supply impacts. Because of the time and effort required to run operation studies and analyze each alternative, the selection was limited to five alternatives and a base case.

Comment: [Page XI-22] The draft environmental report does not clearly identify the base for the discussion on impacts of alternatives on San Joaquin River salmon. Chapter VIII uses a 1984-1992 reference period hydrology, while Chapter XI uses the 1922-1992 historical hydrology. (SJTA-2)

Response: The draft environmental report states on page XI-22 that the effects on aquatic resources are determined using the aquatic resource models described in Chapter VI of the report and the DWRSIM-modeled 71-year hydrology. The DWRSIM study of the base case was conducted as described in Chapter VII of the report. Figures XI-21 and XI-22, which depict salmon smolt survival results, note that "abundance index values are obtained using the USFWS salmon smolt model and DWRSIM model output for 1922-1992."

The analyses of the alternatives are not as detailed as the analysis for the preferred alternative, and model analyses were conducted only over the 71-year modeled hydrology.

Comment: [Page XI-29, 3rd full para.] While the SWRCB can find that the objectives provide a reasonable interim level of protection, it cannot find without more analysis that the fish and wildlife objectives discharge the SWRCB's long term obligations under State and federal water quality statutes and the public trust. (BISF-3)

Response: The analysis in the environmental report is adequate to determine that the objectives will provide reasonable protection for the fish and wildlife beneficial uses of the

waters of the Bay-Delta Estuary. (Wat. Code section 13240) In determining whether there is reasonable protection, the SWRCB must review the competing uses for the water. Considering the many competing demands for the water, and considering the fact that meeting these objectives requires a reduction in amounts of water for other uses, the objectives in this plan provide reasonable protection for all of the beneficial uses.

CHAPTER XII. ECONOMIC IMPACTS OF THE PREFERRED ALTERNATIVE

Comment: For a greater understanding of how the exported water is used, a table should be added showing the acreages, amount of water applied, crops grown, and total subsidies paid to each farm unit receiving CVP or SWP water for the core years 1984 to 1992. For comparison, prepare another table showing the number of commercial salmon boats fishing, the first wholesale price received per boat fishing, and any subsidies received by these boats for the same core years. (SARA-1)

Response: The recommended tables are not necessary to support adoption of the draft plan.

Comment: The SWRCB should undertake a rigorous analysis of the possible social and economic consequences of the proposed plan. It is important to understand the potential social and economic costs the environmental protections contained within the Bay/Delta standards may impose on California. (NCWA-1)

Response: Chapter XII of the environmental report presents the results of an analysis of the proposed plan's economic impacts. The economic models used in this analysis are in general use, and are considered to be capable of producing sufficiently rigorous results. Although no separate social impact analysis was undertaken (the SWRCB is under no legal requirement to produce such an analysis), section D of Chapter XII contains an analysis of "Impacts on Regional Economies." Because economic impacts on small geographic areas are causally related to social effects in those areas, social impact analysis is not entirely absent from the environmental report.

Comment: One thing that concerns me is the lack of a detailed cost-benefit analysis in the environmental report. Efforts that potentially impact employment, substantial capital investment, small farms, and fishermen's lives should be done with this uncertainty in mind. I would like to know what are the costs and benefits of all these aspects that are being considered in the plan. I urge the SWRCB to consider a cost-benefit analysis as one of the key elements of this decision. (Transcript-BFC)

Response: The best available estimate of the economic impact of the plan is provided in Chapter XII. It is not possible to quantify the benefits of the plan, but a discussion of possible benefits is included in Chapter XII.

B. Impacts on Agriculture

Comment: The draft plan as applied to Area I of Westlands Water District does not sufficiently consider the economic impacts of the reduced irrigation deliveries that the USBR is unilaterally imposing under the draft plan. (WWD AREA1-1)

Response: The USBR's decision to reduce deliveries south of the Delta was made in response to its obligations under the federal ESA. Because the SWRCB did not require or request the delivery reductions referred to in this comment, it is under no obligation to analyze impacts specific to those reductions. The economic impacts of the SWRCB's proposed plan are fully analyzed in Chapter XII of the environmental report.

Comment: The following comments were made regarding the economic impacts of increased groundwater pumping. (DWR-2)

1. In an average year, under D-1485 conditions, there is a water shortage of about 900 TAF in the San Joaquin Valley. This shortage is currently being met by overdrafting groundwater basins. This imbalance of demand/supply in the valley has serious implications for the determination of the water supply impacts of the preferred alternative and the corresponding economic impacts.
2. Given this existing shortage, reductions in supplies from the Delta would exacerbate current shortage-related problems, including the groundwater basin overdraft.
3. The environmental and economic impacts of an unsustainable increase in groundwater pumping should be analyzed in the environmental report.
4. In addition to economic impacts, environmental impacts on natural ecosystems are possible. Falling groundwater levels in some agricultural areas can adversely affect deep-rooted trees and shrubs which depend upon a water table sufficiently high to carry them through the dry season.
5. The agricultural impact analysis uses two simplistic scenarios for groundwater use for drought management. Although probably outside the scope of study, a more realistic analysis could reveal important economic impacts not apparent using the simplified approach.
6. The long-term negative effects on pumping depths and the quality of the pumped supply are likely to be significant in some areas of the Central Valley and will be increasingly likely to affect all types of crop production, particularly during drought events. Increased water costs due to increased pumping depths can affect California's competitive advantage relative to other states and other countries.

Response: All economic impact analysis performed on the plan took into consideration the

demand for water in the San Joaquin Valley, as well as the supplies available from the SWP, the CVP, and local sources. The relationship between reduced deliveries and groundwater pumping is discussed in Chapter XII, as are the economic implications of increased reliance on groundwater supplies. The SWRCB does not agree that the difference between the water used in the valley and the water supplied by the projects constitutes a "shortage" attributable to the operations of the projects. Our analysis does not, therefore, begin with an assumed 900 TAF shortage. (The commenters characterization of the shortage implies that the projects are obligated to supply whatever demand may occur.) As stated in Chapters VI and VII, impacts are estimated as the difference between supplies available under D-1485 and under the preferred alternative. Secondary impacts due to such factors as subsidence and tree mortality were not considered due to uncertainty concerning future institutional, economic, and physical limits on pumping, as well as the practical need to restrict the analysis to more direct water supply impacts.

The issue of "California's competitive advantage relative to other states . . .," is an important factor that must be considered in the context of all applicable statutory requirements. The State's competitive advantage is influenced by numerous factors, including federal price support programs, water supply, climate, etc.

As surface water supplies are reduced, increased groundwater mining can be attributed to a number of sound economic and physical factors which have driven expansion of agriculture in California.

Comment: The following comments were made regarding the response of San Joaquin Valley farmers to reduced water supplies. (DWR-2)

1. The SWRCB's analysis assumes that water shortages in the San Joaquin Valley which result from the draft plan will be offset by water transfers within the valley. Because there is no surplus supply in the San Joaquin Valley to offset the reductions in surface water, deliveries would come from land retirement, land fallowing, or increased groundwater overdraft. The preferred alternative assumes water transfers will reduce water supply impacts in the basin. This simply cannot be true considering the fact that the valley has a permanent water shortage and that the CVP is not able to deliver full contract water in any year, even when water is available in storage facilities north of the Delta. Crop shifts are mentioned in the environmental report as a practice that would reduce the impact of the preferred alternative. We agree that crop shifts may occur in some areas. However, the assumption that growers are always able to fallow their least profitable crops and will move to more profitable productions is a gross simplification of the process and would unreasonably underestimate the economic impacts of the preferred alternative. Farmers make decisions on their crop types based on a number of factors including water supply and its cost, soil, climate, pest control and the most important of all, market conditions.

2. The preferred alternative reduces San Joaquin Valley water supplies in two ways--by reducing SWP/CVP export from the Delta and by reallocating the existing valley supply to environmental use in the San Joaquin River. The combined impacts of these actions would be in the range of 0.5 to 1 MAF in average and drought years, respectively. Such a reduction in surface deliveries would reduce agricultural crop acreage by about 200,000 acres in average years. Drought year impacts would be much higher. Most likely lands which are used to grow crops such as cotton would be affected. This would result in a direct loss in crop production of about \$200 million. The environmental report has significantly underestimated the losses by assuming unreasonable assumptions such as increased groundwater use, crop change, water transfer, etc.

Response: Chapter XII of the environmental report does assume that some (not all) of the preferred alternative's water supply impacts in the San Joaquin Valley can be offset by intra-Valley transfers. It also assumes that the water that would be transferred would be made available through the fallowing and retirement of the least productive cropland, crop shifting, and increased irrigation efficiency. Rather than predicting the extent to which transfers are likely to mitigate the economic effects of the proposed plan, however, Chapter XII shows how impacts would vary over two transfer scenarios. The fact that there is no surplus water available in the San Joaquin Valley does not, as this comment argues, preclude an increase in transfers within the valley. So long as physical transfer capacity is available, increased transfers are possible. Unused transfer capacity has always been available in the San Joaquin Valley--even in dry and critically dry years. This capacity has not been utilized due to legal, economic, and institutional barriers. To the extent that these barriers are reduced or removed, water will be transferred to growers who are willing and able to pay the most for it. This will result in a more efficient allocation of water in the valley, and mitigate the economic impacts of the proposed plan. If barriers are not overcome, transfers will not increase, and impacts will be substantially greater (an outcome which should act to speed up barrier removal). The SWRCB's analysis did, as this comment points out, simplify the process farmers use to decide how much of which crops to plant. If a reality as large and as complex as the agricultural economy of the San Joaquin Valley is to be modeled, simplification is absolutely necessary (as it is with the use of models in any discipline). The SWRCB employed simplifications that are used and sanctioned by respected agricultural economists, and which, moreover, are consistent with economic theory. The rational farmer will seek to allocate scarce water supplies, whenever possible, to lands and crops that produce the greatest return per unit of applied water. The price effect of more farmers bringing greater quantities of "higher-valued crops" to market is captured by the Central Valley Agricultural Production Model, which is capable of modeling the longer-term price effects of changed production levels.

Comment: We suggest that the SWRCB re-examine the suitability of the economic parameters, as well as assumptions, used to determine the economic impacts of the preferred alternative. The draft environmental report states that the economic losses are within the range of the normal fluctuations in agricultural production in the valley. A close examination

of the total losses indicates that (1) the losses are not within the normal fluctuations in agricultural production, and (2) these losses present a reduction in economic output of the valley above and beyond the normal fluctuations of agricultural production. (DWR-2)

Response: The DWR's alternative analysis of the economic impacts of the proposed plan assumes a 900 TAF shortage attributable to the operation of the two water projects. The SWRCB believes that the appropriate base case is D-1485 conditions. Although the DWR argues that the SWRCB's methods tend to bias the impact estimates downward, the methods advocated by the DWR have the opposite effect. The SWRCB feels that the analysis in the environmental report is based on the soundest possible methodology and the most defensible assumptions (some of which are described in the responses to other DWR comments, above). The SWRCB also wishes to point out that, in its comments on Chapter XII, the DWR expresses agreement with our finding that the impacts of the proposed plan are "relatively small compared to the whole valley."

Comment: The following comments express the concern that the economic analysis underestimates the impact of the plan. (DWR-2)

1. The conclusion reached in Chapter XII regarding the agricultural impacts is correctly qualified by the statement that, "The economic impact of implementation of the draft plan on agriculture may vary substantially depending on the extent that water can be transferred between users and on the extent that growers are able to respond to reduced availability of surface water by changing crops and pumping groundwater." The conclusion is that "Under the most pessimistic scenario . . ." net losses to producers average \$20 million annually.
2. For reasons given below, we feel that this is an overly optimistic conclusion, even as qualified. It is also only part of the picture. First, growers don't deal with average circumstances only. The distribution of possible outcomes (i.e., variance) is more likely to be important to growers' economic decisions and financial viability and the affected regions' economic health than what average conditions are. If serious economic losses are experienced in quick succession, averages can be irrelevant. Because the draft plan increases the frequency and magnitude of shortage events, this is of real concern.
3. Basing impacts on an average year within the three water year categories can mask a great deal of important information and bias the results of the analysis. Simply put, the economic impact of the effects of the proposed standards on average water supply conditions, whether an average of all years or an average of critically dry years, is not equal to the average of the economic impact of the proposed standards in years falling in those categories, particularly for those categories producing the largest shortages. Nevertheless, it appears that the environmental report's analysis assumed that they were equivalent values.

4. As stated later in the environmental report, producers' income is only part of the losses to the San Joaquin Valley. The cited income multiplier of 2.7 means that losses in income in agriculture and in businesses directly and indirectly related to agriculture can be as high as \$54 million annually, even if the \$20 million figure was appropriate as a lower bound. Although the environmental report is correct in stating that the multiplier number is conservative, this is still significant. Local businesses affected by farm production levels also do not exist in an "average" world.
5. Sole reliance on models to assess agricultural impacts can lead to serious bias; model studies should be augmented with institutional analysis and case studies for credibility.
6. Models show economically optimal conditions for different scenarios of water availability, costs of inputs, crop market conditions, etc. As such they are useful tools for looking at the consequences of decisions which affect water availability from a limited perspective: what is obtainable if all factors of agricultural production are employed to their best economic advantage. This is only one piece of the puzzle, however. The institutional, social, infrastructure, financial, and environmental constraints and consequences associated with obtaining these economically optimal conditions can be only roughly approximated, if an attempt to model them is made at all. While the Central Valley Agricultural Production Model has a provision to take some of these factors into account in its implicit cost function, the rationing model makes no such allowance--a serious shortcoming.
7. The effects of the time needed to adapt to changed conditions as well as the effects of any changes in required financial resources, and management and/or labor skills are also difficult to reflect in models. In addition, because of these factors and the dynamic nature of the marketplace, economically optimal conditions are literally never achievable.
8. Depending upon the specific crops and geographic regions involved, the biases introduced by depending exclusively on model results can range from minimal to severe. For example, effects on farmers in specific regions growing for seasonal niche markets are unlikely to be captured in the model because of geographic and crop type aggregations. The farmer may place a high value on preserving a contractual relationship with a processing plant by maintaining the production of a crop which would otherwise be uneconomical in a shortage situation. Another example is the importance to the farmer of maintaining the production of low-income crops to avoid the loss of "base acreage" for federal crop programs.
9. Although models do provide valuable insights about the economic forces involved, impact analyses should be augmented with specific knowledge about the other, sometimes very important, forces involved whenever possible. To the degree that this can be done, increased credibility can be attributed to the results. The SWRCB largely failed to provide this type of corroborating information.

10. While some communities, non-farm business enterprises, and farm enterprises may have sufficient financial and other resources to cope with each year of a multi-year shortage sequence as well as depicted for the average low delivery year in the draft environmental report, this is very unlikely for many businesses and communities, particularly for small agricultural communities and farm enterprises. Where an individual shortage event analysis might show economic hardship, a multi-year analysis might show economic disaster. This important issue is not addressed in the draft environmental report.

Response: It is possible to conceive of a great many specific and/or localized effects which could in some way be causally related to the proposed plan (e.g., a series of economic losses experienced in quick succession; high costs being borne by farmers growing for seasonal niche markets). Rather than attempt to deal with a multitude of possible specific outcomes, the SWRCB elected to model the most likely and most probable larger-scale project effects. The resulting impact estimates consist--necessarily--of averages. This is often the only way to characterize impacts when time and analytical resources are limited and individual responses to changes will vary. One way to correct for any bias this approach might introduce is to employ conservative assumptions. Conservative assumptions tend to increase the magnitude of the resulting impact estimates, and to decrease the likelihood that actual impacts will be significantly underestimated. One conservative assumption the SWRCB used in its analysis was that local water supplies will be operated similarly from year to year--that no operational changes will be made to reduce the severity of drought-year impacts. In reality, drought impacts can often be mitigated to some degree by increasing local reliance on groundwater, reducing carryover storage, reallocating available supplies, and arranging transfers. The SWRCB also analyzed the impacts of a range of possible water user response scenarios. The SWRCB feels that these measures were sufficient to correct for any bias that may have been introduced by describing primarily aggregated and averaged impacts.

It is also not entirely accurate to assert that the SWRCB relied solely on large-scale modeling results to assess impacts. Smaller-scale impact information was assessed in two ways: by breaking the impact study area up into regions to allow interregional variations to be assessed, and by presenting input-output (I/O) modeling results (the I/O results appear in Section D of Chapter XII). I/O results show income and employment effects on areas as small as individual counties. Such effects are often not captured by larger-scale models, which tend to treat them (properly) as transfers.

One comment in this group also points out that the proposed plan could impose inordinately high costs on farmers growing low-valued crops in order to preserve "base acreages" used in federal agricultural subsidy programs. Primarily for the sake of manageability, the SWRCB's analysis treated agricultural subsidies like other specific anomalies: though they were not dealt with specifically, the aggregate analysis was based on very conservative assumptions in order to ensure that anomalies such as subsidies would not cause actual impacts to significantly exceed modeled impacts.

Comment: The following comments note that aggregated impact estimates can mask smaller-scale, localized effects. (DWR-2)

1. Agricultural impacts are reported as impacts to the San Joaquin Valley. Although, as the environmental report states, impacts can be relatively small compared to the whole valley, this broad scope can mask very serious impacts in small regions or communities. It should be made clear that, although assessing the potential for these types of impacts are outside of the scope of the environmental report, it is important to realize that such effects are possible.
2. In the agricultural sector, where regional problems are likely to be most acute, differences in water rights and water supply contract types as well as differences in the access to—or cost of—surface or groundwater supplies during shortages can result in very different levels of economic impact. The economic health of some agricultural communities can be seriously affected by large drops in the production of specific types of crops because they are labor intensive or make use of a large amount of local goods and services to produce, haul, store, and process, or both. Other communities with a more diversified economic base may be relatively unfazed under the same circumstances.
3. Similarly, communities which are more dependent upon maintaining agricultural land values for tax revenue purposes can be at a serious disadvantage compared to communities with other sources of revenue that are substantial. The former communities can lose a large amount of their capacity to provide needed community services if agricultural land values decline because of added unreliability.

Response: The response to the observation that aggregated impact estimates can mask smaller-scale, localized effects is articulated in a response to the preceding group of comments. In addition, section 4 of Chapter XII describes the primary interregional variation in impact severity. There, it is shown that—in the absence of significant transfers—over two-thirds of the losses in net income occur in western Fresno County.

Comment: The potential for loss of State consumer welfare due to increases in the cost of food and fiber which may accrue due to production cutbacks associated with water shortages is not addressed in the draft environmental report. This effect, although it may be relatively small, should not be overlooked (DWR-2).

Response: A discussion of the potential for decreased consumer surplus as a result of irrigation water cutbacks was not included in Chapter XII for two reasons. First, as noted in the comment, any such effect is likely to be small. Second, any such loss would result in a transfer to the agricultural sector (growers, processors, distributors). The result would be no net change in welfare, economy-wide.

Comment: The following comments deal with the increased risk to farmers due to decreased water supplies. (DWR-2)

1. A major effect of the proposed standards will be to add risk to an already risky agricultural production environment and to reduce income to already financially jeopardized agricultural communities. In some geographic areas this combination is likely to further curtail investment in agricultural production (including the availability and cost of loans to meet crop production costs and for the capital needed to bring higher-valued, but financially riskier, tree fruit and row crops into production). The drop in income will also jeopardize the retirement of current debt and the value of farmland as equity, further limiting the ability to invest. These concerns are not adequately addressed in the agricultural impact valuations.
2. Another important consideration is how variability in crop production will be affected by the proposed rule. Depending upon the geographical area involved and the nature of the market for the specific crop, the consequences can be serious. The ability of farmers to market some crops is dependent upon the reliability of production. Large food producers are likely to drop contracts with growers who cannot deliver with the consistency required in favor of contracts with more reliable growers in competing regions, states, or even countries. The location of grain drying and storage facilities, for example, is influenced by the availability of local farm output to create sufficient income. In turn, jobs in the local communities and costs to farmers are affected by the proximity of these facilities. If production variability increases sufficiently, the owners of such facilities may find the added risk to their income unacceptable, forcing them to close or relocate.

Response: It is unclear exactly why the commenter considers specific coverage of agricultural credit and crop production variability impacts to be significant omissions. The plan's long-term economic impacts on agriculture are discussed in Chapter XII of the environmental report. The models used to estimate those effects took into consideration all variables generally considered to be significant in such estimates. If the commenter is suggesting that the specific inclusion of these variables would have significantly changed the outcome, the SWRCB disagrees. Less water will certainly make credit less available and more expensive, and make it more difficult to produce at predictable levels, but these effects have not been considered important enough to be included in existing agricultural impact models (even the most detailed such models). Regarding the loss of crop processing facilities, the commenter may have a valid point. The SWRCB did not possess the time or the analytical resources to analyze the plan's impacts on sectors with backward linkages to agriculture (I/O models only take into account sectors with which the sector of interest--agriculture--is backwardly-linked). Although it seems doubtful that this adverse impact would be large, we cannot say that it would not be significant.

Comment: The environmental report cites improvements in irrigation systems as a shortage management strategy that can be used by growers to offset the impacts of reduced deliveries.

In most cases, more careful management of their existing system would be the response to reduced water availability. In either case, improved irrigation management by itself will only result in applied water reductions on-farm. It will not reduce the amount of water needed to meet crop evapotranspiration or applied water requirements (ETA); only crop fallowing or switching to crops with lower ETA will have this effect. Improvements in irrigation efficiency may simply mean that a farmer dependent on upstream surface runoff into a drain may no longer have that supply available to meet ETA for his or her crops. (DWR-2)

Response: The basis of the assertion that most farmers will respond to reduced water by managing existing irrigation systems more carefully (rather than installing new systems) is unclear. The economic expectation is that, the longer the period of adjustment, the greater the number of farmers who will install new, more efficient systems. Regarding crop ETA, the SWRCB in no way stated or implied that it is possible to alter crop ETA requirements by changing irrigation systems. Our statement is noncontroversial: more efficient irrigation systems allow the same types and amounts of crops to be raised with less *applied* water. The difference is that more efficient systems result in a larger percentage of the applied water going to ETA and less to return flows. For this reason, many farmers who stay in business over the long-term under conditions of reduced water supplies will install more efficient irrigation systems. This will certainly not occur in every case, but the adoption rate can be expected to rise over time.

Comment: The following comments deal with the effects of water transfers. (DWR-2)

1. As irrigation water shortages become more frequent and are of larger duration and size, water transfers become more costly and less likely to be as successful as in prior years. This is an additional burden on the viability of agriculture. An increasing market for agricultural-to-urban transfers, a consequence of decreasing urban water service reliability, is likely to exacerbate this by being a more financially attractive alternative to transfers within the agricultural community.
2. Although the environmental report cites income from water transferred to urban users as a boon to agricultural areas, if these transfers involve crop fallowing to any significant degree, the negative impacts on those affected by crop production levels and the variability in those levels can be serious. The report does not address this issue even though reduced production levels and increased variability in some geographic areas are likely even before additional transfers to urban areas are considered. Agricultural areas have historically relied upon intra-agency and inter-agency transfers to preserve trees and maintain production of higher-valued crops. Urban areas are planning increased reliance on agriculture-to-urban transfers to meet growing supply reliability needs even without the proposed standards. The proposed standards would not only present additional constraints to moving transferred water across the Delta, under the impact assessment assumptions in the draft environmental

report, they would require an additional reliance on such transfers to manage economic impacts.

3. The DWR Drought Water Bank experience and subsequent studies of that experience have shown that transfers from agricultural areas have substantial local "third-party" economic effects and that local governmental agencies are extremely concerned about their impacts. This concern is very likely to reduce the willingness of such areas to make water available for transfer as the size and frequency of such transfers is increased. In addition, large transfers from a single region or those that would substantially affect the production of a single type of crop (which would be more likely with a larger reliance on transfers) would be likely to severely affect some sectors of the local economy. This impact would not be mitigated by payments to farmers by urban areas because such income would not be likely to find its way to the affected parties (water sales which result in fallowed crops--more likely as the size of the transfers increase--would not make up for income lost by seed sellers, crop haulers, or crop processors). Although overall income to a community may not suffer, some sectors of the economy may suffer severely. The effect of the proposed standards will be to increase the frequency and severity of water shortages to urban and agricultural users. Severity will be affected both in terms of water availability in any one year and the duration of shortages over multiple years. The analysis in the SWRCB's environmental report is based on impacts assessed by water year category and without consideration of how those shortages are actually allocated and the economic, financial, social, and physical consequences of shortages in preceding years. These consequences can be severe depending upon the geographic region in question and the severity of antecedent shortage events. Although the risk of agricultural impacts has been historically mitigated by the ability of agriculture to make internal water transfers and pump groundwater, these options can be jeopardized by increased transfers from agricultural uses to urban uses and by worsening of overdraft conditions due to increased reliance on groundwater. Water transfers from agricultural areas involving in-lieu pumping groundwater as well as more frequent shortages in those areas can both cause additional overdrafting.

Response: Regarding the assertion that decreased agricultural water supplies will render transfers more costly and less successful, considerable evidence points to a quite different conclusion: that the primary impediment to successful, low-cost transfers is not the available water supply, but existing legal and institutional arrangements. Altering or removing the problematic arrangements could substantially increase the amount of water transferred in all types of water years--even if the total supply available to agriculture falls below historical averages.

Regarding the assertion that agricultural-to-urban transfers are undesirable, the SWRCB is charged with allocating water supplies among all competing beneficial uses. Allocations based strictly on the principle of economic efficiency would divert the waters of the State to their highest and best uses. This might, in fact, mean that a higher proportion of available

supplies would go to urban and industrial users. It makes little sense to California as a whole if significant quantities of water are locked into uses which yield low returns when those supplies could, instead, be transferred to users who could realize higher returns. A strong argument can be made for re-allocating water such that a higher proportion goes to urban and industrial uses, leaving agriculture to redirect its share to higher-valued crops--even if the ultimate result is some shrinkage in the agricultural sector. Some adjustment, via re-allocation of water, would probably benefit the California economy. Even if adjustments occur, however, it is clear that water supply reductions with transfers involve far less impact to agriculture than do reductions without them. In addition, the economy of the state as a whole benefits most when there are no artificial barriers limiting transfers between agricultural, urban, and industrial users. The sellers also benefit by being able to sell to the highest bidder. A further point not considered in this series of comments is that, as the supplies of crops grown primarily in California diminish due to decreased water supplies (due in part to transfers out of the agricultural sector), their prices will rise. This increases the return per unit of applied water. As the value rises, the amount of water staying in the agricultural sector will rise. Economic theory would lead us to expect that this and other processes would result in a more efficient equilibrium in all water using sectors.

Regarding the comment that the standards will impede transfers across the Delta, the plan provides the regulatory certainty that has been lacking over the last several years and should therefore facilitate transfers.

Comment: As the duration of a shortage event increases, the costs and losses rapidly increase. The effect is that a shortage twice as large or twice as long is very likely to result in more than twice the economic impacts. As shortages become larger or longer, this phenomenon becomes more pronounced. Any analysis which does not account for this can easily bias the analysis of the economic impacts of proposed actions. (DWR-2)

Response: The SWRCB's analysis was not of a long-duration shortage event, but of a small but permanent decrease in the supply of water available to agriculture. The analysis was based on the normal assumption that, in the short-term, the economic impacts will be the greatest, but that, over the long-term, the agricultural sector will adjust to the new water regime (via transfers, new irrigation technology, crop shifting following, temporarily increased groundwater pumping, etc., as described in previous responses). Although some farm enterprises which operate on relatively narrow profit margins might not be able to withstand the shortage costs the proposed standards would impose (especially during extended dry periods, as this comment points out), our analysis indicates that the sector as a whole will have no difficulty finding a new stable equilibrium point.

Comment: Although some growers may in fact fallow land or change crops in response to reduced water deliveries, those acreages devoted to permanent crops can not accommodate such reductions. Within the Modesto and Turlock Irrigation Districts, approximately 40% of the lands under cultivation are currently devoted to permanent crops; within the Merced

Irrigation District, the amount of permanent crops is approximately 37% of the irrigated acreage. (SJTA-2)

Response: The analysis in Chapter XII of the environmental report assumes that the water available to agriculture would be allocated away from lower-valued forage and grain crops to higher-valued crops (including “permanent” trees and vines). The switching and fallowing would occur on lands where it would no longer be economical to grow lower-valued crops. No switching or fallowing was assumed for higher-valued, permanent crops. Some commenters have argued that, depending upon the extent and duration of the shortage, some lands that currently support permanent crops might have to “accommodate” fallowing (due either to an unavailability of water, or to a steep increase in the price of water). Chapter XII shows that, if such adjustments are necessary, water transfers can go a long way toward mitigating the adverse economic impacts.

Comment: Again the draft environmental report incorrectly assumes that deliveries are reduced by an amount equal to the upstream contribution for additional flow. The process of allocating responsibility for flows is not the subject of this draft plan. Therefore, impacts from the proposed San Joaquin River flows must be allocated solely to the CVP. (SJTA-2)

Response: In order to complete an economic analysis, an allocation methodology for water supply reductions on the eastside of the San Joaquin Valley must be assumed. The methodology used is described in a previous response. As stated throughout the environmental report, no inference should be made at this time regarding final allocations of responsibility.

Comment: The analysis assumes that water can be transferred freely within the 21 areas. Although physically the capacity exists to freely transfer water, current state policies and the limitations discussed in Chapter X, section C, do not promote the free transfer of water. Until such time as those institutional constraints can be reduced or eliminated, the transfer of water is not a viable option to most regions. The SWRCB should look at the factors which need to be resolved to permit transfers under this plan. (SJTA-2)

Response: Nothing in this comment in any way contradicts or calls into question the analysis presented in the environmental report. The analysis in Chapter XII accommodates the uncertainty about the role transfers will play by considering two different transfer scenarios. The point is made in the report, however, that, as supplies decrease (or, at least, do not increase) and demands increase, the likelihood that transfers will become easier will increase.

C. Impacts on Urban Users

Comment: The following comments concern the economic impacts of the plan to the urban sector. (DWR-2)

1. It is unclear whether the damage function used in the analysis of urban impacts consists of average values, to be applied to the entire shortage, or marginal values, to be applied only to an increment of shortage. In any case, it appears from existing studies that these are values most appropriate to residential users and are therefore inappropriate to apply to other sectors experiencing shortage. Unit economic costs and losses to industry can easily be an order of magnitude higher than for residential users for the same percentage cutback. Associated with these industrial losses are employment losses not discussed in the environmental report.
2. Local water agencies can and do reallocate shortages away from industrial and commercial users to protect jobs and to avoid large economic costs and losses and financial hardship to these sectors. If this assumption is implicit in the urban impact analysis, this should have produced residential user shortages that were higher than the overall shortage imposed on an urban service area. This effect can be substantial; depending upon the protection given to the other sectors, an overall shortage of thirty percent can easily translate to more than a thirty-five percent shortage imposed on the residential users. There is no indication the environmental report adjusted the calculated losses on this basis.
3. Shortages can impose large “fixed costs on urban water agencies as they implement programs to encourage voluntary reductions in water use, impose alternate-day watering schemes, detect unreasonable use (e.g., “gutter flooded patrols”), or run rationing programs which use some type of “hearing” process to exempt hardship cases. The environmental report did not address these costs. Another impact overlooked is the impact on jobs and income in the “green industry.” Although the end of a shortage will allow some businesses (e.g., nurseries) to recoup some of their losses, the disruption of income to some small enterprises such as lawn maintenance services can result in extreme hardship and even bankruptcy, particularly in a continuing drought situation.

Response: The values in the loss function presented in Section C.1 of Chapter XII are marginal values, to be applied to increments of shortage. The values are based on studies of residential water users. An examination of the effect on the standards on individual industries was beyond the scope of this environmental document. However, some industrial water use is for relatively low-valued uses, such as vehicle washing. Thus, like residential shortage costs, industrial shortage costs are low at small shortages and increase as the shortage increases and begins to affect higher-valued uses. Utility managers attempting to minimize the aggregate impact of a shortage on their customers will attempt to allocate water between user types in a way that equalizes marginal shortage costs for each class of user. This response will tend to reduce aggregate shortage costs toward those indicated by the shortage cost function for residential water users.

When averaged over all years, the costs of managing shortages are likely to be a small proportion of water utilities’ total budgets. Because water utilities have good access to

credit, costs averaged over all years are the relevant measure of impacts on utilities. An examination of impacts on producers of horticultural products, retail nurseries, and landscape contractors is beyond the scope of this environmental document. We recognize that water shortages are likely to have temporary adverse impacts on the landscaping industry. However, in the long run, the industry will adapt to a situation where its customers are facing deeper and more frequent water shortages.

D. Impacts on Regional Economies

Comment: The draft environmental report indicates that displaced jobs do not represent a permanent job loss to the region. This is not true because without the loss of water, the regional job market would have increased faster as opposed to remaining stable or decreasing. (SJTA-2)

Response: It is common, but incorrect, to assume that any loss of jobs in a region always reduces the future basis for regional job growth. In some areas, it could be the case that decreased agricultural water supplies serve to hasten economic transitions already underway. A more rapid change from agricultural to municipal-industrial uses could raise the basis from which future job growth occurs. A change to more labor-intensive crops could have a similar effect. The point is that a loss of jobs at any one point in time has no easily predictable effect on future job market trends. The best indicators of future regional job growth are larger-scale economic trends. The California economy is currently in a growth phase, and the economy of the Central Valley is growing faster than the overall state average. This trend alone would indicate that job losses related to agricultural water supply reductions will not be permanent.

E. Impacts on Hydroelectric Power Generation

Comment: [Page XII-17] Does the inclusion of PG&E and Southern California Edison in the hydroelectric power generation analysis imply that they will also be required to contribute to Bay-Delta flows? Is the same true for Sacramento Municipal Utility District which does not appear in the analysis? Who will pay for the impacts on hydroelectric purchase agreements (SJTA-2)?

Response: The hydroelectric power production impacts summarized in the environmental report were submitted by other entities (Western Area Power Administration and the Association of California Water Agencies). As the SWRCB's summary states, the analysis was based on the assumption that some flows currently dedicated to hydroelectric generation (including some flows used by the Sacramento Municipal Utility District) would be dedicated to meeting the Bay-Delta water quality standards. The reports submitted to the SWRCB were silent on how this re-direction (and related impacts such as increased use of electric groundwater pumps) would affect hydroelectric purchase agreements.

Comment: [Page XII-18, para. 1] Does the statement “The accuracy of this information has not been verified by the SWRCB staff” mean that the SWRCB staff has verified all the information where this statement is not present? (SJTA-2)

Response: The statement has been removed. The SWRCB relied upon many sources in preparing this draft environmental report, and the sources are referenced.

Comment: Chapter XII should include a summary of the economic impacts on power users in addition to the impacts on water users. (NCPA-1)

Response: The hydroelectric power production impact estimates described in Chapter XII were submitted by the Western Area Power Administration and the Association of California Water Agencies. These results do not include disaggregated estimates of the economic impacts on power users. Only aggregate estimates to the Western Area Power Administration and its customers were reported.

Comment: The following comments concern the hydroelectric power generation analysis. (NCPA-1)

1. The final economic analysis has been completed by the Western Area Power Administration, and it should be included in the final environmental report.
2. The values in Table XII-6 are not consistent with the power impact values we have calculated.
3. Table XII-6 and associated text seem to be in error. The values that we reported for Restoration Fund Costs and Offset by Surplus Sales Revenues, which result in higher total costs of about \$2 million annually, are included with this comment letter.

Response: The Impacts on Hydroelectric Power section in Chapter XII of the draft environmental report was based on information provided by the Western Area Power Administration in its October 18, 1994 submittal. That information was presented without alteration or revision of any kind. The updated information is included in the final environmental report.

F. Benefits

Comment: [Page XII-23, Table XII-7] The benefits listed in the table are highly questionable--most do not apply to the Bay-Delta Estuary or to California. If the SWRCB is not estimating the benefits accruing from its proposal, then what is the purpose for including a table such as this? (SJTA-2)

Response: As stated in the text, Table XII-7 was included in order to illustrate “the potential magnitude of some of the values the preferred alternative would produce.” The

limitations and applicability of these values to California were also acknowledged: "values specific to the Bay-Delta system cannot be extracted from most of these studies." The absence of benefit values specific to the Bay-Delta system made it important to demonstrate to readers of the environmental report that the proposed plan would produce economic benefits, and that the magnitude of those benefits are potentially large. To omit this discussion could imply to some readers that the plan is without benefits.

Comment: [Page XII-24, para. 2, 1st sentence] We agree that the "relationship between smolt survival and the size of the adult population, evidence of a significant positive relationship is lacking (sic)." (SJTA-2)

Response: Comment noted

CHAPTER XIII. EFFECTS OF PREFERRED ALTERNATIVE ON SPECIAL STATUS SPECIES

Comment: This chapter contains an analysis of the preferred alternative on special-status species. For clarity, we recommend that a paragraph be added to the first page prior to Section I to discuss the relationship of this chapter to the environmental impacts discussion: "Special-status species impacts are also a component of the environmental impacts analysis, and were considered in analyzing potential environmental impacts of the project and in selecting the preferred alternative." (JCWU-1)

Response: The clarification has been added to the introduction to Chapter XIII.

Comment: Adverse impacts to spring-run salmon and other anadromous fish using the Estuary during the November through January period could be substantial. The plan's requirements may be a regulatory improvement, but the actual level of exports and water quality conditions could result in conditions more adverse than under the D-1485 regime. In order to achieve a finding of no significant impact, the environmental report should include under its description of proposed measures: (1) timely implementation of the narrative salmon requirement; (2) exercise of operational flexibility; (3) monitoring and research programs designed to better identify needs of special status species; and (4) implementation of Category III, CVPIA and other initiatives. (BISF-2)

Response: The plan has been modified and addresses these concerns. Section B.2 of Chapter IV of the plan addresses the salmon narrative objective including: (1) its timely implementation through the water rights proceeding; (2) its consistency with the goals of the CVPIA; and (3) the operational and other measures necessary to double the natural production of chinook salmon from average 1967-1991 levels. The issue of operational flexibility is addressed in revised Footnote 22 to Table 3 in the plan, which states that variations in operations will be agreed to by the operations group, established under the Framework Agreement. In the section on Monitoring and Special Studies (section D of

Chapter IV), the plan states that agencies and interested parties are developing a near-real-time monitoring program to assist the operations group.

Comment: [Page XIII-23, para. 1] Delete the statement that the Suisun Slough thistle was "Last observed in 1974...". Insert: "DWR staff has observed and mapped the distribution of this species at two locations in Suisun Marsh in 1991-1994 (DWR 1994)". (DWR-2)

Response: The text has been amended, as recommended.

Comment: [Page XIII-25, para. 4] Delete the statement "especially in the Cutoff Slough vicinity" when referring to the decline of the clapper rail population. The Cutoff Slough population is still present, but it is not the most dense concentration of rails in Suisun Marsh. California clapper rails are present in tidal marshes along the Grizzly Bay and western Suisun Bay shoreline, Suisun Slough, Cutoff Slough and Hill Slough. (DWR-2)

Response: The text has been modified accordingly.

Comment: [Page XIII-26] Delete: "The proposed increases in freshwater outflow are within the historical range of salinities experienced in the past and are not expected to adversely affect the California clapper rail." California clapper rails were first observed in Suisun Marsh in 1979. There are no records of definitive survey for clapper rails in Suisun Marsh before this time. It is unknown whether clapper rails were present in Suisun Marsh when the historical ranges in salinities were affecting Suisun Marsh. There has been a reduction of suitable habitat for the species in the downstream reaches of the Estuary. It is unknown whether the proposed standards will adversely affect the California clapper rail in Suisun Marsh, but this is a possibility. (DWR-2)

Response: The text has been modified to state that the proposed increases in freshwater outflow are within the historical range of salinities experienced in the recent past. The additional outflow required by this plan is small in comparison to actual outflows and their annual variation.

Comment: [Page XIII-35] The draft environmental report states that the proposed standards, including San Joaquin River pulse flows in April-May and increased base flows from February to June, will benefit winter-run smolts. Additional spring flows on the San Joaquin River have never been identified in any winter-run chinook salmon biological assessment or biological opinion as having a benefit to that species. There is no scientific justification for this statement. The decline in winter-run is strictly related to Sacramento River conditions and export-caused impacts. (SJTA-2)

Response: The 1993 NMFS winter-run biological opinion states that (page 53) elimination of reverse flow conditions in the western Delta (QWEST > 0 cfs) from February through April and maintenance of lower reverse flow conditions from October through January should reduce losses of winter-run chinook salmon. Higher San Joaquin River flows increase

QWEST, which is the calculated flow in the lower San Joaquin River. Therefore, higher flows on the San Joaquin River may benefit winter-run chinook salmon.

The decline of winter-run chinook salmon is primarily a Sacramento River issue. However, reduced outflow from the San Joaquin River basin has contributed to the degradation of the aquatic habitat in the Estuary. The San Joaquin River flow standards are intended to improve these habitat conditions. Winter-run chinook salmon rear and migrate through this area, and improved habitat conditions should benefit them as well as many other species.

Comment: Winter-run will lose out under this plan. Needed protection can be provided through greater percentage outflow from November through at least April and one percent take limit. (SARA-1)

Response: The 1993 NMFS biological opinion stated that peak emigration of winter-run chinook smolts through the lower Sacramento River and Delta usually occurs from January through March. As discussed in Chapter XIII of the environmental report, winter-run protection will be provided by the proposed standards during the period from February through April. These standards include: the Delta outflow standards, closure of the Delta Cross Channel gates, pulse flows, maximum export limits, and export/inflow limits. Additional protection is provided in January through Delta Cross Channel gate closure (45 days from November through January). The SWRCB agrees that it would be possible to provide greater protection for winter-run, but the level of protection provided by the plan is believed to be reasonable at this time.

The NMFS signed the Principles for Agreement and agreed to the standards contained in the plan. The take limit is established by the NMFS; and is not under the authority of the SWRCB.

Comment: [Page XIII-36, 2nd full para., 1st sentence] The statement that Delta smelt are most abundant in the entrapment zone for most of the year is not supported by any data, and conflicts with historical and current data. See previous comments on Delta smelt in Chapter V. (DWR-2)

Response: The text has been modified to reflect our current understanding of the hydrodynamics of the Estuary and distinguish low salinity habitat from the entrapment zone. The point of the statement was that Delta smelt are most often found just upstream of low salinity habitat.

Comment: [Page XIII-39] The upstream projects should not be required to provide increased flows on the San Joaquin River in order to maintain net seaward flows while export project pumping continues. The Delta smelt problem and the causes of its decline are strictly a project-related, export problem.

The draft environmental report notes that the declines in Delta smelt have been attributed primarily to restricted habitat and increased losses through entrainment by Delta diversions [draft environmental report, p. V-62]. The decline in Delta smelt coincides with the increases in the proportion of water diverted since 1984. Prior to 1984, and before the sharp decline in Delta smelt abundance, the entrapment zone was generally located in the western Delta. Since 1984, however, the increased export pumping has shifted the entrapment zone upstream into the Delta river channels. See also Table 2.3 in USFWS, Technical /Agency Draft Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes, December 1994, which evidences the decline in Delta smelt abundance after 1982. The proposed standards will require non-project San Joaquin River flows to offset the impacts of increased export pumping.

We recommend that if the Old River Barrier is not installed during the spring outmigration period for the San Joaquin chinook salmon, then the SWRCB should require a complete cessation of export pumping for a minimum of four weeks during the April-May period. The precise four weeks should be determined each year by the SJTA and the San Joaquin River Basin Flow Coordinator depending on the time the smolt outmigration takes place. (SJTA-2)

Response: The principal cause of the shift in the location of low salinity habitat over the last few years was the extended drought in California.

The Delta smelt problem is not exclusively an export problem. Habitat values in the Estuary have degraded due to many causes, including reduced inflows and outflows, especially in the spring. Inflows to the Delta have decreased, especially in the spring. The flows from the San Joaquin River basin are established to contribute to and improve general habitat conditions in the lower San Joaquin River and Delta. Reduced outflow from the San Joaquin River basin has contributed to the degradation of the aquatic habitat independent of export impacts.

Delta smelt will probably benefit from improved habitat conditions, resulting from increased outflows, as will chinook salmon, striped bass, and other species.

The SWRCB recommends that agencies test the use of a barrier at the head of Old River in the spring (and fall), as a means of improving survival of migrating chinook salmon (Chapter V of the plan); however, the SWRCB will not require that it be installed because of possible adverse impacts to other species. The DWR and the USBR have stated their intention to install the barrier when feasible. The SWRCB will consider adding a requirement for installation of the barrier in subsequent proceedings.

The SWRCB believes that cessation of export pumping for four weeks during the April-May period is not necessary or reasonable.

Comment: [Page XIII-39, para. 3] The first two sentences are not supported by either historical or current data. Adult and juvenile Delta smelt were and still are always found in greater abundance in the Delta than in Suisun Bay, in wet years or dry years, during either

the "good" or "bad" periods. Please refer to the previous comments on Delta smelt and in particular, Appendix 1. (DWR-2)

Response: The Delta smelt analysis is based in large part on information from USFWS documents. Recent information and analyses provided by the DWR contradict certain conclusions presented by the USFWS. The text has been amended to reflect the current understanding.

CHAPTER XIV. ENVIRONMENTAL CHECKLIST

Comment: The environmental checklist in the draft plan contains several groundless determinations. For example, the checklist concludes that the draft plan will cause "substantial reductions in the amount of water otherwise available for public water supplies". It also concludes that the draft plan will result in no "deterioration to fish and wildlife". Finally, the checklist concludes that the "project will result in increased groundwater withdrawals to replace decreased water supplies". (PORGANS-1)

Response: The objectives in the draft plan, if implemented, will restrict the ability of the CVP and the SWP to export water from the Delta, and it will require releases from storage to meet new, higher outflow requirements. These restrictions and requirements will reduce the amount of water otherwise available for public water supplies. The best available estimate of the water supply impact is provided in Chapter VII of the environmental report. When one source of water is limited, water users shift to an alternative supply which in many cases is groundwater. Lastly, the sole reason for the shift in water supplies from consumptive uses to public trust uses is to improve habitat conditions for fish and wildlife.