results, even partially, the assumptions and assertions that lead to these results should be accurate and transparent. Indeed, the failure to utilize an accurate model to assess the environmental impacts renders the DEIS/R's analysis inadequate. *See Berkeley Keep Jets Over the Bay v. Board of Port Commissioners,* 91 Cal. App. 4th 1344 (2001) (finding that agency improperly relied on outdated air quality model to assess the impact of toxic air contaminants.)

Given the paucity of available empirical water quality data, evaluations of project impacts on water quality and flow are dependent upon flow and water quality modeling efforts. However, hydrodynamic modeling by any known technique is not an exact science. Models are easily manipulated and should not be employed as substitute for hard data or common sense. Subtle changes in coefficients or assumptions can dramatically alter output. Input variables are critical. Proper calibration and verification is crucial. Even then, models are only an idealization of actual field conditions and must be used with caution to ensure that underlying assumptions hold for the site-specific situation being modeled. For example, the DEIS/R's assumption that future water flow patterns will be similar to those that have occurred in the past is clearly inconsistent with the body of literature on the effects of global warming on California water flows. The use of average values in modeling ensures results that are generally unprotective of specific water quality criteria. Virtually all models, even those subject to peer-review, have significant rates-of-error, often greater than plus or minus 50%. **CSPA-45**

The DEIS/R fails to identify and discuss:

1. Model input variables; i.e., channel geometry, surface and bottom temperature and density, constituent concentration, velocity, friction factors, stratification, etc.
2. Calibration and verification of models; i.e., adequacy of baseline data for various constituents and how closely output conforms to actual field measurement.
3. Assumptions used in modeling flow and water quality. For example, CalSim II studies for the SDIP have assumed that Stanislaus River operations are in accordance with the USBR's New Melones' Interim Operation Plan. However, since the Interim Operation Plan cannot be met during drought cycles, the model cannot accommodate the lack of New Melones' storage and reduced instream flow during consecutive drought years.
4. Foreseeable future changes: i.e., loss of storage capacity due to sedimentation and the continuing 80 year decline in snowmelt as a percentage of yearly runoff.

The independent peer-review report titled *A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California* that was submitted to the California Bay Delta Authority Science Program in December 2003 documented numerous problems with the model. (Attachment 6) The report stated that "[I]n our opinion CalSim II has not yet been calibrated or validated for making absolute predictions values. Report at 6.1, absolute Values or Comparative Results. It further stated that the panel is skeptical of the suggestion that, while the model might not

27

generate a highly reliable absolute prediction because of errors in model specification and /or estimation, it might produce a reasonably reliable estimate of the relative change in outcome.

Among the many weaknesses noted by the peer-review panel are:

1. The model is too complex and did not handle particular components of the system with sufficient detail.
2. The mode provides limited and inadequate coverage of non CVP or SWP water and of the California water system south of the Delta.
3. The model assumes that facilities, land-use, water supply contracts and regulatory requirements are constant over this period, representing a fixed level of development rather than one that varies in response to hydrologic conditions or changes over time.
4. Groundwater has only limited representation in CalSim II.
5. Groundwater resources are assumed infinite, i.e., there is no upper limit to groundwater pumping.
6. The linear programming model considers only the current month, and hence CalSim II operating rules are required to determine annual water allocations, to establish reservoir carryover storage targets, and to trigger transfers from north of Delta to south of Delta storage.
7. Better quality control is needed both for the model and its current version and input data. Procedures for model calibration and verification are also needed. Currently many users are not sure of the accuracy of the results. A sensitivity and uncertainty prediction capability and analysis is needed.
8. Need improved ways of altering the model's geographic scope and resolution and its temporal resolution to better meet the needs of various analyses and studies.
9. Need to improve the model's comparative as well as absolute (or predictive) capabilities.
10. CalSim II needs better capabilities for analyzing economic, water quality, and groundwater issues.
11. Need improved documentation explaining how the model works, its assumptions, its limitation, and its applicability to various planning and management issues.
12. DWR and USBR have not provided a centralized source of support for CalSim II. More training for CalSim II is needed. There is a need for more people who can run CalSim II. There is a need for a well-publicized user group. A more extensive users' guide is needed.
13. Improved capabilities are needed for real-time operations especially during droughts, gaming involving stakeholders during a simulations run, handling of evapotranspiration and agriculture demand changes over time, water transfers, Delta storage, carryover contract rights, refuge water demands and more up to date representation of Feather River, Stanislaus River, Upper American River, San Joaquin River and Yuba River operations.
14. Need an improved graphical user interface to facilitate input of model data, setting of model constraints and weights, operating the model, and displaying and post analysis of model results.
15. Need to be able to change the model time period durations for improved accuracy of model results.

Many of the above-enumerated weaknesses of CalSim II were also identified in the

CSPA-45

28

survey report from the University of California at Davis. Ferreira, et al. 2003. Additional flaws in the statistical basis for CalSim II was revealed in a recent study titled *Analysis of CALSIM's Statistical Basis* by Arve Sjovold, 28 December 2005.

Additionally, an expert panel sponsored by the CalFed Science Program and the California Water and Environmental Modeling Forum recently reviewed the CalSim II model representation of the San Joaquin River. http://science.calwater.ca.gov/workshop/calsim_05.shtml. The January 2006 report titled *Review Panel Report San Joaquin River Valley CalSim II Model Review* found that the model:

CSPA-45

1. Used incomplete data sets.
2. Underestimated salinity.
3. Underestimated releases of water from New Melones Reservoir that leads to overestimates of water availability to entities dependent on New Melones storage.
4. Documentation and testing was not sufficient to provide users or model results with a complete reasonable basis for understanding the accuracy and limitations of results.
5. Did not include groundwater.
6. Took loss and return flow rates from older model without re-examination and scrutiny.
7. Failed to update Westside water demands.
8. Failed to include error rates.

Since the San Joaquin River module sets boundary conditions for the Delta, errors are likely to be carried over to the rest of CalSim II's output.

Another recent critique of CalSim II titled *An Environmental Review of CalSim-II, Defining "Full Environmental Compliance" and "Environmentally Preferred" Formulations of the CalSim-II Model* by Jeffrey T. Payne and Dr. David R. Purkey of the National Heritage Institute, November 2005, (Attachment 7) was prepared in order to examine the transparency of CalSim-II and to measure the current version of the model against two important standards. This report is purposely focused on two specific questions.

1. Does the representation of environmental regulations and objectives in CalSim-II represent full compliance with current legal requirements?
2. Can CalSim-II be used to plan for water management alternatives associated with improve environmental outcomes and habitat restoration?

The NHI report does not deal with any of the other CalSim-II issues identified in the CalSim-II Peer Review. All of the issues identified in the review cause flaws in the results displayed in the SDIP EIR/S. The Natural Heritage Institute (NHI) was hired to carry out the technical analysis needed to determine whether CalSim II can answer the above questions. The first question was posed in order to assure that the current

formulation of CalSim-II is consistent with all current environmental regulations on California's water resources.

CalSim-II attempts to characterize all components of the regulatory structure. This report reviewed a significant but limited subset of these regulations. Those reviewed were selected based on the experience of a panel of environmental experts. This selection does not imply that characterizations of other regulations in CalSim-II meet the full compliance standard. In fact, it would be very valuable for the SDIP proponents to complete a similar analysis on the model characterization of all existing environmental regulations. With regards to the Full Compliance standard, NHI identified three areas where the assumptions and assertions in the current version of CalSim-II were at odds with the expert panel's interpretations of existing environmental regulations:

CSPA-45

- **CalSim-II uses information not available to real time operators of the California water system.** This allows CalSim-II to relax environmental standards earlier than is the case in actual operations. As a result, the model under-allocates water needed to satisfy existing environmental regulations; in turn, the model makes that water available for export to south of Delta contractors or other uses.
- **CalSim-II is not faithful to Federal law that allocates water to meet ecosystem restoration objectives.** The 1992 Central Valley Project Improvement Act calls for 800 TAF of water to be allocated for environmental regulation and the logic of CalSim-II does not fully honor this requirement.
- **CalSim-II currently includes no requirement to maintain a minimum flow in the San Joaquin River below Friant Dam**, contrary to a court ruling requiring such flows. This allows for allocation of water to urban and agricultural uses in the Friant Service area rather than allocating that water to maintain water in the San Joaquin River.

For each of these deficiencies, this report proposes a series of actions that can be taken in order to improve the performance of the model. These should be considered the minimum steps required to meet the Full Compliance standard for the regulations reviewed as part of this effort.

The second question is motivated by the SDIP proponent's historic failure to protect and restore the Sacramento-San Joaquin watershed as legally required. Long-term monitoring of the system suggests that threatened and endangered fish populations are in serious jeopardy. A prudent approach to water management planning would use modeling tools that evaluate the impact of various environmental regulations on water deliveries. CalSim-II has not been crafted to include this flexibility.

As examples of the kinds of new regulations that may need to be considered before CalSim-II can be adequately used in SDIP, the expert panel identified the following regulatory changes that the model needs:

30

- CalSim-II should have the flexibility to shift salinity compliance points to allow more targeted tributary restoration action. For example, changing the location of the Vernalis salinity standard may reduce the burden on the Stanislaus River.
- CalSim-II should have the capacity to shift required salinity profiles in the Delta (X2) to benefit Delta-dependent species.
- CalSim-II should allow for the prioritization of tributary environmental objectives, such as targeted operation of the Nimbus/Folsom system for the American River.
- CalSim-II should allow for the modification of Delta export restrictions to target improvements in the Delta ecosystem.
- CalSim-II should not count, towards the satisfaction of environmental regulations, water that otherwise would have been released as part of unavoidable reservoir spills.
- CalSim-II should allow for the definition of flow requirements that result in periods of spring high-flow and summer low-flow conditions in Central Valley rivers.

CSPA-45

These changes are consistent with the need to comply with existing environmental laws (CEQA, NEPA, ESA) through the evaluation of alternatives, including identifying those that are the most environmentally beneficial. Given the historic difficulty associated with returning the San Francisco Bay/Delta to a viable ecosystem, these changes would allow policy makers to engage in more thoughtful alternatives analysis.

Having completed this environmental review of the CalSim-II model the authors of the attached review say, "we are left with the profound impression that it is not a tool that can – under its current formulation – fully address the legally required water management objectives. CalSim-II is, after all, a tool that has been designed to determine how best to operate the state's hydraulic infrastructure in ways that maximize the satisfaction of contractual demands. This reality is a result of both the history of water model development in California and a general analytical approach that has held sway for decades in the field of water resources planning and analysis. This approach holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters. Instead, a reformulation of the model along the lines described in this document is needed."

This philosophy of including the environment as an objective in water resources management is gaining credence around the world. Unfortunately, in California we cannot get to this point if we limit ourselves to the current version of CalSim-II. In any event, CalSim II is an inadequate tool for SDIP alternatives analysis as it cannot be adjusted to solve for improved environmental conditions; it can only tell us how to maximize exports. In other words, CalSim II cannot measure environmental impact above baseline standards; it can only measure the impact of improving the environment on water export amounts. Project proponents have also improperly employed CalSim II results to represent precise predictions regarding potential impacts although it has not yet

been calibrated or validated for making absolute predictions values. That is not acceptable NEPA/CEQA environmental analysis. CSPA-45

Finally, we note that the U.S. District Court for the Northern District of California recently issued a Temporary Restraining Order in an action brought by the Planning and Conservation League against the BOR enjoining construction of the Intertie because, in part, the BOR failed to disclose the short-comings of the data or models. Here, the DEIS/R for the SDIP also fails to disclose error-bars and numerous other limitations in the modeling. The DEIS/R also inappropriately uses the model for predictive rather than comparative purposes, especially in addressing whether the project would meet specific water quality standards, maintain specific tidal levels, etc.

IX. The DEIS/R's Mitigation for Project Impact is Inadequate and Fails to Comport with Legal Requirements.

As the California Supreme Court has repeatedly emphasized, "the chief goal of CEQA is mitigation or avoidance of environmental harm." Laurel Heights I, 47 Cal.3d at 403; see Goleta II, 52 Cal.3d at 564. CEQA requires public agencies such as the County to implement this goal through a three-step process. First, the County must accurately identify, analyze, and disclose the adverse impacts of a Project. Stanislaus Natural Heritage Project v. County of Stanislaus (1996) 48 Cal.App.4th 182, 196-97. Second, the County must "identify mitigation measures for each significant environmental effect." Guidelines § 15126.4(a)(1)(A). Finally, the County must actually adopt such mitigation measures, unless it is infeasible to do so. § 21002.1(b) ("Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so."); Citizens for Quality Growth v. City of Mt. Shasta (1988) 198 Cal.App.3d 433, 440-41.

"Mitigation" as defined in CEQA includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments

CEQA Guidelines section 15370. This definition of the term "mitigation" adopts the definition contained in the federal NEPA regulations. The federal definition is used so that this term will have identical meanings under NEPA and CEQA for projects that are subject to both acts.

32

The DEIS/EIR proposes a novel set of "Mitigation Measures" for the impacts associated with the proposed actions. As discussed below, these actions will not reduce or avoid significant project impacts, but instead seem to totally rely upon the Environmental Water Account (EWA) and fail to meet the requirements of either NEPA or CEQA, as they are contingent on other actions outside the scope of, and beyond the control of, this project.

This deficiency is clearly evident in the text taken from page 6.1-2 of the DEIS/EIR: **CSPA-46**

1. *Avoidance Measure.* All pumping at SWP Banks that is in excess of the existing permitted capacity from November 1 through June 30 will be tracked by EWA and SWP/CVP operations staff. When EWA actions reduce exports for fish protection during this period, any pumping at SWP Banks that is above the existing permitted capacity will be reduced without cost to the EWA account, limited only by the amount of pumping reduction funded by the EWA (i.e., maximum of 100% match with EWA action).

This suggests that the proponents agree not to use the excess "Banks" pumping plant capacity to pump above the existing permitted capacity, only if, and limited by the size of, the EWA actions at that time. However, it would appear to reserve the right to exceed the permitted capacity, if any remained, after the EWA action was taken into account.

In other words, the project proposes to exceed the "existing permitted export capacity" when it suits them. Clearly this is not mitigation for project impacts, but would in fact exceed the limits of the EWA, the very measure the project relies upon to reduce project impacts.

2. *Crediting Measure.* From November 1 through March 31, pumping reduction credits will be given to the EWA (ranging from 10% to up to 30%) for all non-EWA pumping that is above the existing permitted capacity. Under this mitigation component, for each 100 taf of non-EWA pumping above the existing permitted capacity, a pumping reduction credit, ranging from 10 taf to 30 taf, could be used by EWA to reduce pumping during periods of high fish density. **CSPA-47**

This measure appears to offer a 1:10 (or a 3:10) exchange for non-EWA pumping above the existing permitted capacity, between November 1 and March 31. Again, the project proposes to permit "non-EWA pumping above the existing permitted capacity" as it suits them.

The limitation of actions to mitigate for losses that may occur during the May 16 to May 31 pumping, which is subject to actions by the EWA, is not mitigation. There is no certainty to the proposed mitigation and it is subject to an action that is unrelated to this project. As such, it has not met the test of mitigation, since it is not available without other independent actions. Further, the decision maker cannot with any certainty

determine the level of mitigation being proposed, since the nature of the external actions cannot be determined.

Given the definition from CEQA, it is difficult to see how the various proposed mitigation measures in the DEIS/R are valid. For example, "Mitigation Measure Fish–MM–1 " is premised on another action by an unrelated event i.e., the actions of the EWA. Nowhere in the definition is the mitigation, of acknowledged impacts, made subject to contingencies based on an unrelated event. The DEIS/R also fails to make provision for mitigation in the event EWA actions are not taken to reduce entrainment. As a result, MM-1 relies entirely on an existing program, the EWA, to mitigate new impacts associated with the SDP. The EWA has already proven unsuccessful at protecting aquatic species in the Delta. This existing program cannot satisfy the requirement that impacts associated with the SDIP be mitigated, especially since EWA winter pumping has been targeted by the IEP POD studies as a potential cause of the loss of Delta smelt in the winter. Finally, studies (or initiatives) are not mitigation. **CSPA-48**

Mitigation Measure Fish-MM-3: Minimize Entrainment Losses of Delta Smelt Associated with Increased SWP Pumping (Volume 1 – Page 6.1-96) states that "[t]he SWP has proposed increased funding through an amended Four-Pumps Agreement to support SDIP mitigation measures, including an expanded EWA. In the absence of the EWA, that increased funding would continue to be available to DFG to mitigate impacts of the SDIP through purchases of water to reduce pumping during critical periods for fish or other mitigation strategies developed through the adaptive management process." The funds in the Four-Pumps Agreement are mitigation for on-going losses of fish the result of the existing operations of the SWP. Why would those funds be used to then permit additional damage? Those funds are (or should be) fully encumbered for existing loss mitigation. It is the worst form of chicanery to propose the use of these funds to permit the projects to increase their impacts on the populations of fish we are trying to preserve. **CSPA-49**

Impact Fish-68: Operations-Related Increases in Entrainment Losses of Splittail (Volume 1 – Page 6.1-99) acknowledges spawning on the San Joaquin River, and an increase of up to 40% in entrainment (10 to 20% in other years), but concludes that no mitigation for these increases is warranted due to the Sacramento River production, and the fact that they occur in the drier years. The loss is acknowledged, the impacts can be avoided or minimized, and the mitigation is feasible but proponents simply decided that they just don't want to do it. This is unacceptable and in violation of CEQA and NEPA. **CSPA-50**

The bottom line is that the DEIS/R relies upon the EWA for mitigation despite the complete lack of credible studies documenting the success of the EWA in reducing adverse impacts from water exports. Indeed, the decline in Delta fish species has occurred and accelerated concurrent with increased exports and operation of the temporary barriers. As an added insult, the DEIS/R states that mitigation measures would be carried out "if necessary." The DEIS/R must clearly define precise mitigation measures that will be established and the specific assurances that will ensure that the mitigation measures will be successfully implemented. **CSPA-51**

34

Thank you for considering these comments. Please place us on all lists to receive the FEIS/R, notice of hearing dates and the Notice of Determination. We reiterate our request that the comment period be extended another 30 days in order to allow sufficient time to review and analyze the 2,788 pages of this document.

Sincerely,

Bill Jennings
Chairman & Executive Director
California Sportfishing Protection Alliance

35

CSPA SDIP Comments Attachment 1

Comments on

Draft Environmental Impact Statement Environmental Impact Report
South Delta Improvement Program

Prepared by

Bureau of Reclamation for the U .S. Department of the Interior and the Department of Water Resources for the State of California Resources Agency'

Submitted by
G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD
G. Fred Lee & Associates
El Macero, California
gfredlee@aol.com www.gfredlee.com
February 5, 2006

The Department of Water Resources (DWR)/US Bureau of Reclamation (USBR) (DWR/USBR, 2005) draft EIS/EIR states,

> *"The general purposes of the SDIP were identified by the Agencies, as follows:*
>
> *(c) increase water deliveries and delivery reliability for State Water Project (SWP) and Central Valley Project (CVP) water contractors south of the Delta and provide opportunities to convey water for fish and wildlife refuge purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay from 6,680 to 8,500 cubic feet per second.*

Basically, in this draft EIS/EIR DWR/USBR have attempted to justify increasing the amount of South Delta water exported by the Central Valley Project (CVP) and State Water Project (SWP).

The Draft EIS/EIR further states,

> *"The impact assessment focuses on benefits and impacts to hydrology, water quality, fish resources, recreation, vegetation and wildlife, …"*

We are familiar with current water quality issues in the South Delta and the generally inadequate understanding of how the current South Delta water exports through the CVP and SWP impact Delta water quality. **We find that the draft EIS/EIR for the proposed expanded export of South Delta water is significantly deficient in providing an adequate, reliable discussion of the potential water quality impacts of the proposed project.**

At the time of the notice of preparation of this EIR/EIR we were highly involved in a study of the low dissolved oxygen (DO) problem in the San Joaquin River (SJR) Deep Water Ship Channel (DWSC). We were the coordinating principal investigators for a $2-million CALFED-supported study of the characteristics of the low DO problem, factors

influencing the DO in the DWSC, the sources of the oxygen demand, and potential approaches for controlling the concentrations of DO in the DWSC to eliminate violations of the DO water quality objective (WQO). It was through those studies that we found that the CVP and SWP exports of South Delta water were a major factor contributing to the low-DO problem in the SJR DWSC.

We developed a SJR DWSC low-DO "Issues report" for the SJR DWSC TMDL Steering Committee that identified and described many of the issues that needed to be addressed as part of studying the nature of the DWSC low DO problem (Lee and Jones-Lee, 2000). We also developed a Synthesis Report summarizing and integrating the results of the approximately $4-million of studies conducted by about a dozen investigators on the DWSC low-DO problem (Lee and Jones-Lee, 2003a). That synthesis report also presented our findings on the impact of SJR flow in the DWSC on DO depletion below the WQO. Of particular importance were the results of the DWR D-1641 SJR cruises, in which DO was measured at about biweekly intervals from late summer to early winter at the Rough and Ready Island DO monitoring station, and the USGS monitoring of SJR DWSC flow. Lee and Jones-Lee (2003a) reported that when the SJR DWSC flows were on the order of a few hundred cfs, severe low-DO problems occurred in the DWSC. However, when the SJR DWSC flows were above about 1,500 cfs there were no DO WQO violations in the DWSC.

Since completion of the synthesis report we have continued to examine the relationship between SJR DWSC flow and DO WQO violations, and have issued a series of reports of our findings (Lee 2003a, b, 2005a,b; Lee and Jones-Lee 2003a,b,c; 2004a; 2005a,b,c). Those follow-up studies have confirmed that low SJR DWSC flow is a major factor contributing to violations of the DO WQO in the DWSC. It has also been noted that the export of South Delta water through the USBR CVP and DWR SWP is the primary cause of low SJR flow in the DWSC. Basically those projects at times, draw most of the SJR Vernalis water into the South Delta through the Head of Old River to the CVP and SWP export pumps. Figure 1 presents a map of the Delta area of concern in the Delta Improvement Package.

When the SDIP request for comments on the CEQA scope was issued, it was with this background that Lee (2002) submitted comments on the water quality issues that needed to be addressed in the EIS/EIR. Lee (2002) stated,

> "*A credible, certifiable EIR/EIS for the SDIP should include a detailed evaluation of the full range of water quality problems caused by the South Delta diversions and how they will be corrected as part of implementing the SDIP.*"

CSPA-52

Lee (2002) also stated,

> "*As discussed in these reports, the South Delta currently has significant water quality problems of low DO, currently-used pesticide caused aquatic life toxicity, legacy organochlorine pesticide excessive bioaccumulation in edible fish which are a threat to cause cancer in people who use the fish as food, excessive*

37

nutrients and elevated salts and TOC. Dr. Anne Jones-Lee and I have just completed a review for the Central Valley Regional Water Quality Control Board

CSPA-52

Figure 1

38

on the organochlorine pesticide and PCB excessive bioaccumulation problems in Central Valley fish, which shows that Old River and Paradise Cut fish have excessive concentrations of legacy pesticides that are a threat to the health of those who use these fish as food."

CSPA-52

There is no doubt that the existence and operation of the permanent operable barriers will have water quality impacts, many of which are not currently recognized.

A number of key factors will ultimately govern how the operable barriers are operated. Salinity is only one of those factors. Others include:

- potential impacts on the low-DO problems,
- excessive bioaccumulation of mercury, organochlorine "legacy" pesticides, and PCBs that accumulate in fish and other organism to threaten the health of those who eat those organisms,
- aquatic life toxicity, and
- other pollutants in several of the South Delta channels.

CSPA-53

Lee and Jones-Lee (2004b) have provided a comprehensive review of Delta water quality issues that need attention as part of evaluating the potential impacts of the SDIP.

A review of the "Water Quality" section of the draft EIS/EIR shows that the draft EIS/EIR does not conform to CEQA requirements of providing full disclosure of potential environmental impacts of the proposed SDIP. Instead, consideration of water quality impacts has been essentially limited to potential impacts on salinity in South Delta Channels. The current modeling of salt, a conservative parameter, does not address the behavior and impacts of non-conservative pollutants such as pesticides that cause aquatic life toxicity. While there is mention of low-DO situations in some South Delta channels, the discussions are superficial and inadequate to inform the readers of the draft EIS/EIR about the potential impacts of the proposed increased export of water on the low-DO situation in South Delta channels.

CSPA-54

The draft EIS/EIR also fails to address the large number of other water quality issues in the South Delta that have been impacted by the current water exports by the CVP and SWP and that will be exacerbated by the increased water exports that will occur if the proposed SDIP is approved. Further, there is no discussion of the impacts of the proposed operation of the operable barriers that are part of the proposed SDIP. As indicated above, the Lee and Jones-Lee (2004b) review of Delta water quality issues provides a discussion of the lack of understanding of impacts of the CVP and SWP on the large number of water quality issues that exist in the Delta overall and especially the South Delta. Many of the Delta channels have been listed as US EPA Clean Water Act (CWA) Section 303(d) impaired due to excessive concentrations of variety of pollutants compared to WQOs.

CSPA-55

CSPA-56

DWR and the USBR have not complied with SWRCB (2000) Water Rights D-1641 requirements to reliably delineate the potential impacts of exporting South Delta water on Delta water quality. Lee and Jones-Lee (2004b) observed that those agencies have

39

apparently convinced the IEP managers that the proposed exports will not cause any water quality impacts and that there is no need to conduct a comprehensive water quality monitoring/evaluation in the Delta to assess the impacts of the exports. The fallacy of that approach was clearly brought to light in the findings of an independent expert panel review of the current pelagic organism decline (POD) (POD Review, 2005). The POD has resulted in a crash program to attempt to quickly gather information to define and understand the potential combined impacts of CVP and SWP exports on POD. Lee and Jones-Lee (2005a) discussed the problems with that approach, which stem from the subtle nature of potential impacts of exports on water quality.

During the past six months we have been developing a San Joaquin River Water Quality Issues Report (Lee and Jones-Lee, 2006) as a follow-up to our Delta Water Quality Issues report (Lee and Jones-Lee, 2004a). Table 1, taken from Lee and Jones-Lee (2006), lists the current TMDLs for the SJR. The Lee and Jones-Lee (2002, 2006) SJR water quality issues reviews also list a number of potential water quality issues that could readily lead to CWA section 303(d) listings for the SJR that would require TMDLs to be developed to control the loads/conditions that are causing WQO violations.

WQO violations that occur in the SJR at Vernalis can also contribute to WQO violations in the South Delta as a result of the CVP and SWP export projects' drawing most of the SJR Vernalis water into the South Delta either through the Head of Old River or through Turner Cut. As discussed by Lee and Jones-Lee (2006), this results in the carrying of SJR water quality problems into the South Delta and to some extent into the Middle Delta. The proposed SDIP will amplify the water quality impacts of the SJR watershed as well as contribute locally derived pollutants. A credible EIS/EIR for the SDIP must include an evaluation of the potential impacts of the proposed increase in exports and an assessment of the impacts of the operation of the operable barriers on Delta water quality. This will require a large-scale, focused, comprehensive, multi-year monitoring and evaluation program, with particular attention to Delta aquatic life resources, to gather the background information needed to begin to reliably assess the potential impacts of the proposed SDIP on Delta water quality. The current POD studies are not focusing on many of the issues that will need to be addressed in order to develop a credible EIS/EIR for the SDIP. **CSPA-57**

Because of this major deficiency, the current draft EIS/EIR is inadequate and rejected as failing to comply with CEQA requirements. DWR and USBR should be required to fund a multi-year monitoring/evaluation program delineated by an independent panel of experts that would be responsible for organizing the studies, overseeing the implementation of the studies, reviewing results as they are developed, and reviewing the appropriateness of the draft reports and conclusions. This study program review should be conducted in a manner that provides the public with adequate opportunity to be informed of the progress and findings of the review and to provide and have considered comments on the approach and findings. It will take several years of study and assessment to obtain an adequate information base upon which to develop an EIR/EIR that could reliably assess the water quality impacts of the then proposed SDIP involving

40

increased CVP and SWP exports of South Delta water, and the potential consequences of various methods of operable barrier operation approaches. CSPA-57

Table 1. San Joaquin River Watershed TMDLs
Updated from Lee and Jones-Lee (2002)

Current (Active)
Selenium
Salinity at Vernalis, Total Dissolved Solids (TDS), Electrical Conductivity (EC)
Boron
Organophosphorus (OP) Pesticides (Diazinon, Chlorpyrifos)
Oxygen-Demanding Substances (BOD/Algae, Ammonia, Organic N)
Pending (to be Developed)
Organochlorine "Legacy" Pesticides (DDT, Chlordane, Dieldrin, Toxaphene, etc.)
PCBs
Dioxins/Furans
Mercury
Sulfate (Bioaccumulation of Mercury)
Pathogen-Indicator Organisms, *E. coli*, Fecal Coliforms
Toxicity of Unknown Cause
Salinity Upstream of Vernalis
Potential Future (to be Evaluated)
Nutrients, Excessive Fertilization (Nitrogen and Phosphorus Compounds)
High pH, Low DO caused by Excessive Fertilization (Photosynthesis/Respiration)
Alternative Pesticides to OP Pesticides including the Pyrethroid-Based Pesticides that are Causing Water Column and Sediment Toxicity
PBDEs.
Total Organic Carbon, and other chemicals such as Bromide that develop into Disinfection Byproducts (Trihalomethanes) in Treated Domestic Water Supplies
Excessive Sediment, Erosion, Turbidity
Herbicides (Toxicity to Algae)
Aquatic Sediment Toxicity, (Pesticides, Nutrients/Algae/Sediment Ammonia, Heavy Metals, PAHs and other Chemicals)
Unrecognized Pollutants
Pharmaceuticals and other Unregulated Chemicals Discharged by Confined Animal Facilities (dairies, feedlots, etc.) and domestic wastewaters

A key part of the monitoring/evaluation program should be an assessment of the mitigation that DWR/USBR would need to implement to eliminate, to the maximum extent practicable, the adverse water quality and aquatic life impacts of the current export of South Delta water for the projects.

One of the conditions that also need to be evaluated in this program is the beneficial impacts of reduced South Delta exports by CVP and SWP from the current conditions. CSPA-58

41

Incorporation of this approach is justified since the current water export rates were not based on a reliable assessment that they could be practiced without adverse impacts on Delta aquatic ecosystems. CSPA-58

The draft EIS/EIR Chapter 5 Section 3 presents DWR/USBR's assessment of SDIP impacts on "Water Quality". The introduction to that discussion states,

> *"5.3 Water Quality*
>
> *Introduction*
>
> *The maintenance of beneficial uses of Delta waters depends on several key water quality variables (e.g., salinity, water temperature, dissolved oxygen, and dissolved organic carbon) in Delta waters. This chapter describes these key water quality variables, the objectives associated with maintaining beneficial uses of Delta waters, existing Delta water quality conditions, and impacts of the SDIP project on selected water quality variables in Delta channels and exports."* CSPA-59

That chapter then reviews the perceived impacts of the SDIP increased exports and barrier operations on "Water Quality." It is stated in Chapter 5,

> *"Summary of Significant Impacts*
>
> *There are no significant impacts on water quality as a result of implementation of the project alternatives. Operation of the tidal gates provides substantial improvements in salinity in the south Delta channels. There are occasional slight increases in salinity occur in the CCWD intakes and at SWP Banks, but these are less than 5% of the baseline values. The water quality benefits are less under Alternative 4B, which includes constructing only the head of Old River gate."*

In the subsequent section it is stated,

> *"Affected Environment*
>
> *Delta waters serve several beneficial uses, each of which has water quality requirements and concerns associated with it. The Delta is a major habitat area for important species of fish and aquatic organisms, as well as a source of water for municipal, agricultural, recreational, and industrial uses. Dominant water quality variables that influence habitat and food-web relationships in the Delta are temperature, salinity, suspended sediments (SS) and associated light levels for photosynthesis, DO, pH, nutrients (nitrogen and phosphorus), DOC, and chlorophyll. Other key constituents that are monitored in water for municipal are bromide (Br–) concentrations (measured in raw water) and concentrations of THMs or other chemical by-products formed during the disinfection of water (measured in treated water).*

That presentation of so-called water quality impacts illustrates one the fundamental flaws of DWR/USBR's approach to water quality evaluation. The focus of the DWR and

42

USBR discussion is on selected aspects of municipal and agriculture uses of Delta waters. Those who understand water quality know that water quality impacts of a proposed project must be evaluated from all perspectives, as they relate to the impairment of the beneficial uses of a waterbody. DWR/USBR considers water quality as being limited to the quality of the water that is exported. These agencies largely ignore the vast arena of conventional water quality issues associated with the impacts of pollutants on the beneficial uses of a waterbody.

The federal congress defined water quality in the Clean Water Act in terms of all designated beneficial uses of a waterbody. By definition in the CWA, the exceedance of a water quality standard/objective is an impairment of beneficial uses of a waterbody that must be corrected. As discussed by Lee and Jones-Lee (2004b) there are highly significant water quality problems in the Delta that are caused by known chemicals that that occur at concentrations above the applicable WQO for the Delta channels. Most importantly with respect to Delta water quality, water manipulation/diversions/exports do impact how pollutants in the Delta impact aquatic life-related beneficial uses of Delta waters. Changing the flow of water in the Delta will impact the location and magnitude of pollutant impacts on aquatic life and other beneficial uses of Delta waters.

CSPA-59

An example of this can be seen with the potential impacts in the SJR sulfate that is brought into the South Delta by the CVP and SWP. The concentration of sulfate affects the methylation of mercury. The CVRWQCB (2005) has indicated that the manipulation of flows in the South Delta as part of DWR-proposed operation of the operable barriers could affect the distribution of sulfate in the South Delta channels which, in turn, could affect the bioaccumulation of mercury in edible fish. There is need to evaluate how the operation of the South Delta operable barriers that are scheduled to be installed and operational by 2009 could affect the bioaccumulation of mercury in South Delta fish.

In testimony before the SWRCB hearing on the DWR and USBR draft Cease and Desist Order to prevent violations of the South Delta Salinity standard established as part of D-1641, Lee (2005c) indicated that DWR, as part of developing the operation of the South Delta operable barriers, will need to expand its scope of evaluation of barrier operation to include not only EC but also the impact of sulfate on mercury bioaccumulation. In addition, that evaluation should include the impact of barrier operations on the impacts of the other pollutants on the CVRWQCB 303(d) list for South Delta channels and other constituents that, while not on the 303(d) list, are impacting South Delta water quality. Lee (2005c) also suggested that DWR needs to more reliably evaluate the potential benefits of installing low-head, reverse-flow pumping across the permanent operable barriers to bring more Sacramento River water into the South Delta. Adoption of this approach could be highly cost-effective in improving South Delta water quality as well as the quality of the CVP-exported water. It could also help solve the low-DO problem in the DWSC.

Overall, the draft EIS/EIR cannot be certified as a credible discussion of SDIP water quality impacts. It does not provide a reliable evaluation of how the increased exports

and operation of the barriers will impact the aquatic life related beneficial uses of the Delta.

Cited References

CVRWQCB, "Sacramento-San Joaquin Delta TMDL for Methyl and Total Mercury Draft Report," Central Valley Regional Water Quality Control Board, Rancho Cordova, CA, August (2005). http://www.waterboards.ca.gov/rwqcb5/programs/tmdl/deltahg.html

DFG, "Delta Smelt Action Plan," CA Department of Fish and Game, Sacramento, CA, October (2005).

DWR/USBR, "South Delta Improvement Program Draft EIS/EIR," CA Department of Water Resources, Sacramento, CA (2005).
http://sdip.water.ca.gov/documents/draft_eis_eir.cfm

Lee, G. F., "Comments on Scope of South Delta EIS/EIR," submitted to Paul Marshall, Department of Water Resources and Dan Meier, US Bureau of Reclamation, Report of G. Fred Lee & Associates El Macero, CA, October 30 (2002).
http://www.gfredlee.com/South-DeltaEIS.pdf

Lee, G. F., "Impact of San Joaquin River Deep Water Ship Channel Watershed and South Delta Flow Manipulations on the Low-DO Problem in the Deep Water Ship Channel," Submitted to the US Bureau of Reclamation OCAP Biological Assessment, Sacramento, CA, Report of G. Fred Lee & Associates, El Macero, CA, July 10 (2003a).
http://www.members.aol.com/duklee2307/FlowImpact.pdf

Lee, G. F., "Review of 2003 SJR DWSC Flow and Dissolved Oxygen Data," Report of G. Fred Lee & Associates, El Macero, CA, July (2003b).
http://www.gfredlee.com/SJR.Jan.July.DO.Flow.2003dl.pdf

Lee, G. F., "SJR DWSC DO WQO Violations and DWSC Flow during the Summer 2005," Report of G. Fred Lee & Associates, El Macero, CA, September (2005a).
http://www.members.aol.com/annejlee/DOFlowSummer2005.pdf

Lee, G. F., "June 2005 SJR DWSC Flow and DO," Report of G. Fred Lee & Associates, El Macero, CA, July (2005b).

Lee, G. F., "Comments on the CA State Water Resources Control Board Cease and Desist Order to Cause the US Bureau of Reclamation and CA Department of Water Resources to Control Salinity Violations in the South Delta Compliance Points," Testimony presented at CA SWRCB evidentiary hearing, Sacramento, CA, November 7 (2005c). http://www.members.aol.com/annejlee/CeaseDesistSalinity.pdf

Responses to Comments

CSPA-1

For each alternative for each resource, the impacts of Stage 1 are evaluated first. This analysis assumes no change in the operations of the SWP and CVP. Therefore, an alternative that includes the four gates, dredging agricultural diversion modifications, and the assumption that existing 6,680 cfs operations would continue, is analyzed. Secondly, the effects of each operational component are evaluated assuming that the permanent gates are operating (2A, 2B, 2C, 3B, 4B).

CSPA-2

The SDIP Draft EIS/EIR clearly presents the direct effects of the SDIP on CVP and SWP contract deliveries. A large fraction of this water is additional Article 21 water for SWP contractors. The potential for future increases in water transfers, and the need for additional EWA purchases and transfers of upstream purchases, are described separately. All possible effects of the SDIP on water supply and water management operations are accurately described.

CSPA-3, CSPA-4, CSPA-6, CSPA-7, CSPA-8, and CSPA-9

Please see Master Response D, *Developing and Screening Alternatives Considered in the South Delta Improvements Program Draft EIS/EIR.*

CSPA-5

Please see Master Response A, *Relationship between the South Delta Improvements Program and the Operations Criteria and Plan.*

CSPA-10

The SDIP is consistent with VAMP assumptions that survival of juvenile Chinook salmon improves if they are not diverted into Old River. It is assumed that juvenile Chinook salmon blocked at the head of Old River will be less likely to be subsequently diverted back into the south Delta channels at Turner and Columbia Cuts, because the tidal flows, providing a downstream migration cue, in the San Joaquin River at these downstream locations is much greater than at the head of Old River.

CSPA-11

DSM2 tidal simulations (Section 5.2 of the SDIP Draft EIS/EIR) demonstrate that minimum water levels can be maintained above the target elevation of 0.0 feet msl with the proposed tidal gate operations. Salinity at CVP Tracy Pumping Plant and at other south Delta locations will be reduced substantially (10%). Please also see Master Response I, *Reliability of CALSIM and DSM2 Models for Evaluation of Effects of the South Delta Improvements Program.*

CSPA-12

The first objective will be met through construction and operation of the fish control gate at the head of Old River. The second project objective will be met by the flow control tidal gates and dredging. The major factor affecting water supply reliability in California is the uncertain annual rainfall and snowpack depth. Increased export capacity can improve reliability by allowing greater diversions at times when fish issues are not limiting. Increased export capacity provides water contractors access to water when it is available (Article 21) so contractors can store it for future use. This flexibility can be used to both protect listed fish species and reduce water shortages in drier years. The SDIP will improve the water supply reliability of the integrated CVP and SWP system of reservoirs, Delta exports, and water conveyance facilities.

CSPA-13

Please see Master Response B, *Relationship between the South Delta Improvements Program and the Pelagic Organism Decline.* .

CSPA-14

Appendix J of the SDIP Draft EIS/EIR describes the POD hypothesis and potential relationships between CVP and SWP pumping levels and entrainment, and subsequent population effects. No accepted hypothesis or mechanism would explain relatively large decreases in the recent abundance of some fish based on relatively small recent increases in CVP and SWP exports. The variations in the annual abundance indices are also described; very large changes in Fall Mid-Water Trawl catch have been observed from month to month and between years. These catch records may not be sufficient to understand ecological mechanisms and species interactions in the pelagic zone. The abundance of the dominant pelagic organisms, American shad and threadfin shad, remains high. All findings from the DWR- and Reclamation-funded POD studies will be fully considered in the SDIP Stage 2 evaluations and decision.

CSPA-15 and CSPA-16

The SDIP Final EIS/EIR will not analyze the relationships between past pumping and annual fish abundance; SDIP Stage 2 evaluations will include all major findings from the POD studies.

CSPA-17

The SDIP permanent operable gates (Stage 1) are assumed to have no impact on pelagic organisms in the lower estuary. CVP and SWP entrainment of pelagic species will not change because existing pumping patterns will not be modified during Stage 1. The head of Old River gate closure, which will protect Chinook salmon, will cause a slightly increased reverse flow from the central Delta (Appendix J of the SDIP Draft EIS/EIR). The fish representatives on the GORT will fully consider these relative fish effects when determining the operations for the head of Old River gate. No other effects on pelagic fish are anticipated during Stage 1.

CSPA-18

Section 5.3 of the SDIP Draft EIS/EIR contains a rigorous analysis of those constituents that have a direct linkage with the SDIP project (EC, DO, DOC). Many other variables may be of concern in the Delta, but they are not affected by SDIP actions.

CSPA-19

The water quality analysis thresholds are based in part on the 1995 Water Quality Control Plan, which was established to protect beneficial uses, including drinking water quality and fish habitat. The CWA 401 certification will be based on the water quality analysis in the SDIP Final EIS/EIR.

CSPA-20

Please see response to comment CSPA-18. No water quality assessment was made for any toxic material because there are no available methods for assessing biological effects from changes in toxic chemical exposure in the Delta and there are no indications that any toxic chemical would be released during construction or operation of the SDIP.

CSPA-21

SDIP will have no effect on compliance with water quality objectives or other water quality control implementation plans (TMDLs) upstream of the Delta. The operable gates will increase the ability to control flows and will reduce salinity in the south Delta channels, including the Old River at Tracy Boulevard and Middle River at Old River (Union Island) EC compliance stations. The effects of the head of Old River fish control gate on San Joaquin River flows at Stockton, and the subsequent improvement in DWSC DO conditions are fully described in Section 5.3 of the SDIP Draft EIS/EIR.

CSPA-22

Please see Master Response N, *Trinity River Operations*.

CSPA-23

Assimilative capacity (dilution) of tributary streams is based on low-flow periods. The SDIP will have no effect on the low-flow hydrology; minimum release flows are required below all major CVP and SWP reservoirs.

CSPA-24

Page 2-23 of the SDIP Draft EIS/EIR presents some of the permitting to which DWR and Reclamation will have to adhere to conduct dredging in the Delta. Permits are necessary from the Corps and the RWQCB. Page 2-24 indicates that recent past dredging projects in a nearby channel did not encounter chemical contamination of the dredge spoils. Although DWR and Reclamation will need to conduct similar sampling to verify this, significant chemical contamination is not expected in any of the sediments proposed to be dredged under the SDIP. Recently (June 2006), DWR completed preliminary sediment coring to determine the quality of the sediment for disposal on agricultural land or for use on levees. Additional sampling may be required during and after dredging as a part of the dredging permits.

CSPA-25

The existing conditions analyzed in the SDIP Draft EIS/EIR include the existing 0.7 mS/cm and 1.0 mS/cm EC objectives. The SDIP will improve the EC at the Old River and Middle River compliance locations and will have no effect on the Brandt Bridge compliance location. Changing the EC objectives at these Delta locations will not degrade the existing water quality for agricultural users,

because salinity controls will still be implemented to meet the 0.7 mS/cm and 1.0 mS/cm EC objectives at Vernalis.

CSPA-26 and CSPA-27

The importance of Chinook salmon and steelhead is acknowledged throughout the SDIP Draft EIS/EIR and is reflected in the bulk of the biological analysis. Temperature is recognized as a key limiting factor for salmonids and is extensively analyzed (summarized in Tables 6.1-15 through 6.1-26 of the SDIP Draft EIS/EIR). Some adverse survival impacts on salmonids were found that were largely the result of reduced carryover as a result of the proposed operations. However, these temperature impacts were small and occurred in a small fraction of the simulated months. Temperature impacts were considered and found to be less than significant.

CSPA-28

The changes in EC from the SDIP are fully evaluated in Section 5.3 of the SDIP Draft EIS/EIR, including the periods with a 0.7 mS/cm EC objective.

CSPA-29

Please see Master Response N, *Trinity River Operations*.

CSPA-30

The SDIP will not cause any significant drawdown of upstream reservoirs. The reservoir operating criteria (rules) will not be changed by the SDIP. Both CVP and SWP balance water deliveries with carryover storage; the SDIP will not change this balance.

CSPA-31

Section 5.2 of the SDIP Draft EIS/EIR demonstrates that the SDIP will have no effect on the water surface levels at the DMC intake and fish facility. Difficulties with operating this 50-year old facility are serious but will not be aggravated by the SDIP. Reclamation is evaluating cost-effective improvements for the Tracy fish facility.

CSPA-32

None of the agricultural diversions that will be modified (extended) will be replaced with larger or more efficient pumps. Extending the diversions will ensure operations with fluctuating water levels at their original capacity. Because there is no change in the capacity of diversion, this action does not require fish screens.

CSPA-33

The SDIP effects on tidal water levels and tidal flows are fully described and evaluated in Section 5.2 of the SDIP Draft EIS/EIR. Figure 4-1 is a summary of the general effects on water levels. The SDIP will allow the minimum water levels to be maintained throughout the monthly cycle of spring tide and neap tide.

CSPA-34

The Old River at Tracy Boulevard EC data are suspect, because EC is not routinely 2,000 µS/cm. The DSM2 results are reliable, as shown for the other south Delta locations. The comparative results shown for the Old River at DMC or Middle River at Mowry Bridge stations show a good match with measurements. The comparison of simulated EC values for each SDIP alternative with the baseline EC values is the most appropriate method for impact analyses, as shown in Section 5.3 of the SDIP Draft EIS/EIR. Please also see Master Response I, *Reliability of CALSIM and DSM2 Models for Evaluation of Effects of the South Delta Improvements Program.*

CSPA-35

Simplified assumptions and geometry data are used in the DSM2 modeling. However, the results have been verified with actual field data and the comparisons between the baseline and the alternatives are adequate for the identification of significant tidal hydraulic and water quality impacts. Actual channel geometry and diversion flows along each channel are included in DSM2. The tidal flows within each channel are fully described in Section 5.2 of the SDIP Draft EIS/EIR. There are no null zones with the proposed operations of SDIP operable gates.

CSPA-36

It is possible that in the future low-head pumps may be needed to ensure that the SDIP objectives are fully met. Including wiring so that this potential future action can be more easily added represents a prudent measure to ensure the best

possible use of funds for protecting Delta resources. Low-head pumps are not a component of the SDIP and would not be installed or operated without further environmental documentation.

CSPA-37

Figure 5.2-50 of the SDIP Draft EIS/EIR indicates that simulated minimum water levels at the head of Old River gate will be maintained above the 0.0 feet msl objective, even during the April and May period, when the simulated flows through the head of Old River gate were 0 cfs. Tidal filling of the channels and the proposed operation of the agricultural gates will be adequate to protect any diversions during these months. High tide levels, which are necessary for the proper operation of the Tom Paine Slough siphons, will be protected by continued use of Priority 3 operation of CCF gates.

CSPA-38

Dilution and flushing of City of Tracy and Mountain House effluents are important considerations for the actual operation of the head of Old River gate. The GORT will consider the need for a minimum diversion flow of 500 cfs to provide dilution of the Tracy and Mountain House treated wastewater.

CSPA-39

Potential impacts of construction and operation of the SDIP gates are described in Section 6.1 of the SDIP Draft EIS/EIR. While some adverse impacts in the Delta channels are possible, information is limited and there is little factual basis on which to judge the potential impacts of operations in the Delta channels. However, compared to the existing temporary barriers, the permanent gates provide flexibility in operation and do not result in annual disturbances once in place. Additionally, the GORT will allow adjustments in gate operations as new information is obtained.

CSPA-40

The potential effects of increased pumping on winter survival of delta smelt are evaluated in Impact Fish-63. Mitigation Measure Fish-MM-3 provides appropriate mitigation.

CSPA-41

The impact analyses include system-wide effects, for those resources that may be affected. There are no redirected impacts on water management agencies or water users outside of the CVP-SWP operations.

CSPA-42

The SDIP cumulative analysis included the use of the best available information. The qualitative portion of the assessment was based on information about other projects that could affect the same resources, and their potential contribution to cumulative effects was described.

CSPA-43

The SDIP impact assessment and cumulative impact evaluation are consistent with the CALFED ROD and identify significant cumulative effects on fish. Proposed mitigation measures will reduce the SDIP contribution to less than significant. The cumulative water quality effects are less than significant because of the existing water quality regulations and projects that likely will be implemented to improve water quality for municipal and agricultural uses, including CALFED actions and other actions described in the DIP.

CSPA-44

Temporary barriers are included in the baseline. Table 10-1 of the SDIP Draft EIS/EIR has been modified to add the Stockton Intake and DWSC DO projects. The likely responses of the selected species to cumulative effects provide an indicator of the potential responses of other species. The full range of environmental conditions and fish habitat elements potentially affected is encompassed by the assessment for the species specifically discussed.

CSPA-45

Please see Master Response I, *Reliability of CALSIM and DSM2 Models for Evaluation of Effects of the South Delta Improvements Program.*

CSPA-46, CSPA-47, CSPA-48, and CSPA-51

Please see Master Response E, *Reliance on Expanded Environmental Water Account Actions for Fish Entrainment Reduction.*

CSPA-49

The referenced funds are above the current funding level for the Four-Pumps Agreement. SWP funding for an expanded agreement could provide supplemental restoration and replacement actions, as currently are funded for striped bass, steelhead, and Chinook salmon entrainment losses (see Appendix J of the SDIP Draft EIS/EIR).

CSPA-50

Splittail entrainment impacts were simulated to be high in a few years. The average impact, however, was less than 5%. This was found to be less than significant because splittail abundance is linked to the large flooded bypasses of the Sacramento River. The overall fraction of the population that is entrained in the south Delta export facilities is relatively small.

CSPA-52

The SDIP analysis includes adequate background information relative to each resource, including water quality, for full disclosure of SDIP water quality impacts.

CSPA-53

Please see Master Response O, *Gate Operations Review Team*.

CSPA-54 and CSPA-56

Salinity is the primary water quality parameter that will be affected by the SDIP gate operations and pumping changes. The improved tidal circulation in the south Delta channels is expected to improve the periods of low DO that have been observed in these channels.

CSPA-55

The effects of the proposed gate operations on tidal circulation and water quality are fully described in Section 5.2 and 5.3 of the SDIP Draft EIS/EIR. The Draft EIS/EIR does not evaluate general effects of existing levels of CVP and SWP pumping on Delta flows or water quality, because these are the existing conditions.

CSPA-57

DWR and Reclamation support (fund) and their staff participate in the major ongoing intensive monitoring of water quality and fish (IEP) in the Delta. This same monitoring will be continued as appropriate for adaptive management of the SDIP gates, as well as the existing CVP and SWP pumping facilities (EWA).

CSPA-58

Please see Master Response D, *Developing and Screening Alternatives Considered in the South Delta Improvements Program Draft EIS/EIR.*

CSPA-59

There are no established methods for evaluating the assumed linkages between SDIP facilities and operations and the trace organic and inorganic pollutants and precursors that may be of concern. Impact evaluation for these variables would be speculative and was not considered appropriate for the Draft EIS/EIR, which is based on the best available information.