AQUALLIANCE
DEFENDING NORTHERN CALIFORNIA WATERS

March 29, 2013

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95814-0100

Subject: Comment Letter—Bay-Delta Plan SED

Dear Ms. Townsend and the Members of the Board:

The California Water Impact Network (C-WIN)[1], California Sportfishing Protection Alliance (CSPA)[2], AquAlliance[3], Restore the Delta,[4] and Friends of the River [5] appreciate the opportunity to comment on the "Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta: San Joaquin river flows and southern Delta water quality." This letter responds to the State Water Resources Control Board's (hereinafter "SWRCB" or "Board") December 31, 2012, Notice of Filing and of Public

[1] C-WIN is a non-profit, tax exempt California Corporation that advocates for equitable and environmentally sensitive use of California's water, including instream uses. We accomplish this mission through research, planning, public education, and litigation.

[2] The California Sportfishing Protection Alliance (CSPA) is a 501(c)(3) non-profit public benefit conservation and research organization established in 1983 for the purpose of conserving, restoring, and enhancing the state's water quality, wildlife and fishery resources and their aquatic ecosystems and associated riparian habitats. To further these goals, CSPA actively seeks federal, state, and local agency implementation of environmental regulations and statutes and routinely participates in administrative, legislative and judicial proceedings. Where necessary, CSPA directly initiates enforcement actions on behalf of itself and its members to protect public trust resources.

[3] AquAlliance exists to challenge threats to the hydrologic health of the northern Sacramento River watershed.

[4] Restore the Delta is a 10,000-member nonprofit grassroots organization committed to making the Sacramento-San Joaquin Delta fishable, swimmable, drinkable, and farmable to benefit all of California. Restore the Delta works to improve water quality so that fisheries and farming can thrive together again in the Sacramento-San Joaquin Delta.

[5] As California's statewide river conservation organization, Friends of the River's mission is to preserve, restore, and sustain California's free flowing rivers and streams. Since 1973, Friends of the River has successfully lobbied and mobilized public support for the permanent protection of more than 2,100 miles of Wild & Scenic Rivers in California.

Comment Period and Hearing on the Adequacy of the Draft Substitute Document in support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacrament/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality.[6] This letter also responds to the Notice of Extension of Public Comment Period, issued January 17, 2013, which extends the time period for commenting on the SED from March 5th to March 29, 2013.

C-WIN, CSPA, AquAlliance, Restore the Delta, and Friends of the River also welcome the Board's decision last fall to include in the administrative record of Phase I the workshop submissions that the Board received at the September, October, and November 2012 workshops that were convened during Phase II activities on the comprehensive review of the Bay-Delta Plan. The submitted testimony by Chris Shutes, Tom Cannon, G. Fred Lee, and Tim Stroshane representing C-WIN, CSPA and AquAlliance are also hereby incorporated by reference to our comments in this letter. We additionally incorporate by reference several previously submitted comments and correspondences from our organizations to the Board, as well as several exhibits incorporated herein.[7]

Our comment letter identifies violations of the federal Clean Water Act (hereinafter "CWA"), the Porter-Cologne Water Quality Control Act (hereinafter "Porter-Cologne"), the Delta Reform Act of 2009, the California Environmental Quality Act and the Public Trust Doctrine. Further, we observe that the State Water Resources Control Board has put forward proposed amendments to San Joaquin River flow and South Delta salinity objectives for the 2006 Water Quality Control Plan for the Bay-Delta Estuary. Under the Clean Water Act, the Board has failed to comply with requirements to protect the most sensitive beneficial uses, and with its own and federal Clean Water Act antidegradation policy for water quality. The Board has failed to formulate these amendments to the 2006 Bay-Delta Plan in such a manner that analyzes the competing demands of all beneficial uses, and instead has devised a plan that puts maintenance of yield to the water rights of the federal Central Valley Project and the State Water Project over all other beneficial uses, whether propertied or not. In essence, the Board conducted its water quality control planning for the outcome of "no net loss to exports" and ignored its responsibilities to evaluate the competing needs of all beneficial uses in the process of developing water quality objectives.

[6] We note that it is not clear from the notice exactly where the SED has been filed; according to CEQA Guidelines it should be filed with the California Natural Resources Agency.

[7] Incorporated by reference for these comments are:

- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated February 8, 2011 providing comments on the November 2010 San Joaquin River flow and South Delta salinity objectives request for additional information by the State Water Board.
- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated May 23, 2011, providing comments on the scoping of the Southern Delta Ag and SJR Flow Revised NOP.
- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated April 25, 2012, providing comments on the Bay-Delta Plan Supplemental NOP, Comprehensive Review.
- Attached appendices A, B, and C

I. Background

The SED is a substitute environmental document prepared by the State Board during a phased evaluation of the 2006 Bay-Delta Plan, with Phase I focusing on the Lower San Joaquin River flow and south Delta salinity objectives, and Phase II focusing on all other parts of the Bay-Delta Plan. The purpose of the SED is for the board to document its analysis regarding the need for, and effects of, changes to the Bay-Delta plan. The SED proposes new plan amendments to the lower San Joaquin river flow objectives, including along three salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers), during the months of February – June. The SED includes scientific information that indicates that higher flows of a more natural pattern are needed from the three eastside salmon-bearing tributaries to the Lower San Joaquin River during the spring (February–June) to protect fish and wildlife beneficial uses (including San Joaquin River Basin fall-run Chinook salmon and other important ecosystem processes). [8]

The preparation of the SED is governed by many different laws, including state CEQA guidelines, water code section 13241, the Public Resources Code (21159), Porter-Cologne, and the Clean Water Act (as it applies to water quality standards promulgated by the Board). Further, portions of water quality control plans that fall under the jurisdiction of the CWA require approval by the U.S. Environmental Protection Agency. These various laws charge the Board with, among other things, reasonably describing and analyzing potentially significant direct and indirect environmental impacts of a project; describing and analyzing reasonably foreseeable methods of compliance with the regulatory requirements of each alternative, analyzing potentially feasible mitigation measures and the economic considerations of establishing objectives in water quality control plans; and analyzing related indirect and induced impacts on the regional economy including estimating the total cost of implementing the water quality control program.

In addition to the various laws mentioned above, governments have a permanent fiduciary responsibility and obligation to protect the public trust.[9] In *National Audubon Society v. Superior Court*, the California Supreme Court held that "the public trust is more than an affirmation of state power to use public property for public purposes. It is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases when abandonment of that right is consistent with the purposes of the trust."[10] The act of appropriating water is an acquisition of a property right from the waters of the state, an act that is therefore subject to regulation under the state's public trust responsibilities.

The Sacramento-San Joaquin Bay Delta is both a tideland and a marshland. Therefore the Board has authority to protect the Bay Delta pursuant to the public trust. As an agency of the

[8] SED, Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*

[9] Wrote Justice Racanelli in 1986: "In the new light of National Audubon, the Board unquestionably possessed legal authority under the public trust doctrine to exercise supervision over appropriators in order to protect fish and wildlife. That important role was not conditioned on a recital of authority. It exists as a matter of law."

[10] *California Supreme Court, National Audubon Society, et al., v. The Superior Court of Alpine County and Department of Water and Power of the City of Los Angeles, et al.* (1983), 33 Cal.3d 419, 441 (189 Cal.Rptr. 346, cert. denied, 464 U.S. 977).

state, the Board is charged with ensuring the state of California carries out its fiduciary responsibility to protect air, running water, the sea, and the seashore, "these things that are common to all." The board has invoked its public trust responsibilities in regulating the waters of California and acknowledges that the public trust is one of its ongoing regulatory responsibilities.[11] The Board has also adopted regulations governing how it treats the public trust in matters of the appropriation of water in California.[12] The Public Trust Doctrine provides that no one has a vested right to appropriate water in a manner harmful to the interests protected by the public trust. In accordance with this doctrine, California's constitution promises water rights only up to what is a reasonable use. No one has a right in California to use water unreasonably, not even the federal government.[13] In *United States v. State Water Resources Control Board* (1986, 182 Cal.App.3d 82) determined that the Board had the authority to modify an appropriative water right permit once it had been issued, and that it could reduce the US Bureau of Reclamation's Central Valley Project permits to gain compliance from the Bureau.

II. THE SED DOES NOT MEET THE REQUIREMENTS OF CEQA

Although the SED is, by definition, a supplemental environmental document, the Board must comply with the requirements of the California Environmental Quality Act when adopting water quality control plans. Under CEQA, a "project" to be analyzed is defined as "whole of an action" that would cause direct or reasonably foreseeable indirect physical environmental changes.[14] CEQA defines a "project" as plans or programs in which multiple actions are coordinated or facilitated within a framework of policies that govern the sequence or series of those actions. In performing CEQA analysis of a plan or program, then, agencies are prohibited from "piecemealing" or "segmenting" a project by splitting it into two or more segments.[15] CEQA prohibits piecemealing because to segment a project can submerge the cumulative impact of individual environmental impacts. In *Laurel Heights Improvement Association v. Regents of the University of California*, (1988) 47 Cal. 3d 376, 396 the court declared that environmental reviews must "include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects."

[11] State Water Resources Control Board, *Mono Lake Basin Water Right Decision 1631: Decision and Order Amending Water Right Licenses to Establish Fishery Protection Flows in Streams Tributary to Mono Lake and to Protect Public Trust Resources at Mono Lake and in the Mono Lake Basin*, September 28, 1994.

[12] State Water Resources Control Board, California Code of Regulations, Title 23 Waters, Division 3 State Water Resources Control Board and Regional Water Quality Control Boards, January 2011.

[13] California Constitution, Article X, Section 2.

[14] CEQA Guidelines, §15378.

[15] *Burbank-Glendale-Pasadena Airport Authority v. Hensler* (2d Dist. 1991) 233 Cal. App. 3d 577, 592 [284 Cal Rptr. 498] ("This approach ensures 'that environmental considerations not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences."

A. THE SED FAILS TO CONSIDER THE WHOLE OF THE ACTION IN THE SACRAMENTO-SAN JOAQUIN BAY DELTA

In preparation of the SED, the Board has segmented review of the San Joaquin River flow and South Delta salinity objectives from the rest of its activities updating the 2006 Bay Delta Water Quality Control Plan. Specifically, the Board refers in descriptions of its planning process to Phase I being the revision of the flow and salinity objectives, while Phase II is the "comprehensive review" of the 2006 Bay-Delta Plan. The Board has also issued two separate notices of preparation (NOPs) for each segment of its planning process.[16]

In February of 2009, the Board issues a "Notice of Preparation" (hereinafter "NOP") entitled "Update and Implementation of the Water Quality Control Plan for the San Francisco Bay / Sacramento-San Joaquin Delta Estuary." The project purported to analyze "the Bay-Delta watershed and its upstream tributaries and any reservoirs for which water may be used to meet the water quality objectives, including upstream reservoirs and San Luis Reservoir." The area of potential environmental effects encompassed most of the State, including the Bay-Delta watershed, the Trinity River watershed from which water is imported to the Bay-Delta watershed, and areas receiving water exported from the Bay-Delta watershed.[17]

In November of 2009, the State Legislature passed Water Code § 85086 as part of the Delta Reform Act of 2009, which required the Board to develop new flow criteria to protect the public trust.[18] Following extensive testimony, the Board drafted the 2010 Delta Flow Criteria Report, which acknowledged that determining flow criteria for the protection of public trust resources is necessary to "inform planning decisions for the Bay Delta Plan."[19] The report

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[16] State Water Resources Control Board, *Notice of Preparation and of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Southern Delta Salinity and San Joaquin River Flows*, February 13, 2009, p. 2

> The State Water Resources Control Board…will be the lead agency and will prepare environmental documentation for the potential update and changes to implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary… The proposed Project includes both: 1) the review and update of water quality objectives, including flow objectives, and the program of implementation in the Bay-Delta Plan; and 2) changes to water rights and water quality regulation consistent with the program of implementation. Accordingly, the environmental documentation will identify and evaluate the significant environmental impacts associated with potential changes to the Bay-Delta Plan and potential changes to water rights and other measures implementing the plan that may be needed to ensure the reasonable protection of beneficial uses in the Bay-Delta watershed.

[17] Id.., p. 3.

[18] Water Code § 85086, "For the purpose of informing planning decisions for the Delta Plan and the Bay Delta Conservation Plan [BDCP], the board shall, pursuant to its public trust obligations, develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. In carrying out this section, the board shall review existing water quality objectives and use the best available scientific information. The flow criteria for the Delta ecosystem shall include the volume, quality, and timing of water necessary for the Delta ecosystem under different conditions. The flow criteria shall be developed in a public process by the board within nine months of the enactment of this division. The public process shall be in the form of an informational proceeding...and shall provide an opportunity for all interested persons to participate. The flow criteria shall not be considered predecisional with regard to any subsequent board consideration of a permit, including any permit in connection with a final BDCP."

[19] State Water Resources Control Board, *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, Prepared pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009,* Resolution No. 2010-0039 (hereafter cited as "2010 Delta Flow Criteria Report.")

identified several flow criteria for the Sacramento and San Joaquin Rivers, as well as for Delta outflow. The report represents a comprehensive review of water quality objectives, a clear list of "species of importance" and their relevant life stages, an analysis of both beneficial uses and water quality objectives, and an analysis of the times in which water is most important to the health of individual species of fish. [20]

Eight months after publishing the 2010 report, in April of 2011, the Board issued a second NOP on the project entitled "Update to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Water Quality Objectives for the Protection of Southern Delta Agricultural Beneficial Uses; San Joaquin River Flow Objectives for the Protection of Fish and Wildlife Beneficial Uses; and the Program of Implementation for Those Objectives." However, in this second notice, the Board dramatically limited the scope of review of the project to only two project areas: the South Delta, which encompasses both the service area of the South Delta Water Agency and the State and Federal export pumps, and the major tributaries of the lower San Joaquin River (the Merced, Tuolumne, and Stanislaus rivers), together with the lower San Joaquin River itself. [21] The purpose of the review was limited to evaluation of southern Delta salinity and San Joaquin River flow objectives and their implementation through the Bay-Delta Plan under CEQA. [22]

In January 2012, the Board issued a third NOP for the Bay-Delta Plan's Comprehensive Review, addressing all other elements of the Bay-Delta Plan and or potential changes to protect beneficial uses in the Bay-Delta *other than* San Joaquin river flows or South Delta salinity objectives.[23] In essence, what started in 2009 as a Board analysis of a "whole action" affecting the San Francisco/Sacramento-San Joaquin Bay Delta Estuary had become bifurcated by 2011. The segregation of the Sacramento river from the San Joaquin river is a complete departure from how the Board has historically analyzed Sacramento and San Joaquin River water quality objectives. Dating back to at least 1978, the Board has always reviewed the Sacramento River and San Joaquin River water quality objectives in a unified way, as essential elements in the "whole of an action" undertaken as development of the Bay-Delta water quality control plan.[24] As recently as 2010, the Board considered the two river basins simultaneously.[25] Further, consideration of Delta hydrodynamics is illogical without considering the Sacramento and San

[20] 2010 Delta Flow Criteria Report, Table 2, p. 45-46.
[21] State Water Resources Control Board, *Revised Notice of Preparation and Notice of Additional Scoping Meeting*, 1 April 2011.
[22] Id.., p. 3 ("[the Board] is not currently considering any other changes to the Bay-Delta Plan or any specific changes to water rights and other requirements implementing the Bay-Delta Plan.")
[23] State Water Resources Control Board, *Supplemental Notice of Preparation and Notice of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Comprehensive Review,* January 24, 2012 ("The State Water Board is not soliciting information regarding these [the San Joaquin River flow and South Delta salinity objective] potential amendments and related SED at this time.")
[24] See State Water Resources Control Board, *Water Quality Control Plan, Sacramento-San Joaquin Delta and Suisun Marsh*, August 1978,Table VI-1, p. VI-29; *Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, 91-15WR, May 1991, Table 1-1; *Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, 95-1WR, May 1995, Table 1; and *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary,* December 13, 2006, Tables 1 through 3.
[25] See generally the 2010 Delta Flow Criteria Report

Joaquin rivers simultaneously. First, the hydrodynamics of the Delta are not readily segmented because the Sacramento and San Joaquin River inflows meet in the central and south Delta river channels and are intermingled with tidal flows coming east from the Carquinez Strait and Suisun Bay. Second, when considering water quality, inflows from the San Joaquin River must be analyzed because of their potential effect on waters reaching the central Delta and Old River channels from which state and federal project pumps near Tracy draw water for exports. Third, the Sacramento and San Joaquin River inflows jointly govern the timing and magnitude of salmon recruitment from the ocean and salmon smolt outmigration, as well as the degree to which conditions in the Bay Delta estuary provide habitat for salmon, steelhead, and resident and migratory species like longfin smelt, Delta smelt, and striped bass.

1. THE SED FAILS TO CONSIDER THE EFFECTS OF SALINITY LOADS COMING IN FROM THE WEST SIDE OF THE SAN JOAQUIN VALLEY

The Central Valley Regional Water Quality Control Board has acknowledged that salinity impairments of the state's water bodies are occurring with greater frequency and magnitude. Such impairments in the past have led to the fall of civilizations. Additional salts not discussed in the SED are imported to the San Joaquin River Basin as a result of mixing with salty tidal flows with water in the western Delta before being exported by large pumps located near Tracy. These saltier supplies arrive in the western San Joaquin Valley via the Delta Mendota Canal. The Central Valley Regional Water Quality Control Board estimates that the Delta Mendota Canal imports about 900,000 to 1 million tons of salt each year into the San Joaquin River Basin while the San Joaquin River returns about 922,000 tons of salt to the Delta annually.[26] The conveyance of water through the Delta Mendota Canal is made possible by Board-issued water rights permits to the US Bureau of Reclamation to operate the Central Valley Project and by the Exchange Contract by which senior San Joaquin River water rights holders "exchange" their upper San Joaquin River water rights for imported Sacramento River water delivered to them via the Delta Mendota Canal.

The "Exchange Contract" for this imported water recognized from the outset that salinity in the imported water would be greater than salts naturally occurring in San Joaquin River water. The original Exchange Contract stated that it should not exceed a five-year mean salt concentration of 400 parts per million (see Table A-1 in Appendix 1). Thus, planned importation of water into the San Joaquin River Basin allows as much as a nine-fold increase in salt concentration in water applied to western San Joaquin Valley lands. This is the direct water quality impact of the exchange arrangement at the heart of the creation of the Central Valley Project's Friant Division, the Delta Mendota Canal, and the Jones Pumping Plant. Large amounts of imported water bring large loads of salt to the Basin as well. By piecemealing the project into a multi-part analysis of the Bay-Delta, the Board fails to fully disclose and analyze how salts from the western San Joaquin valley contribute to the salinity loads entering the lower San Joaquin River.

[26] California Regional Water Quality Control Board 2006: Tables 2 through 5

B. THE SED FAILS TO ESTABLISH AN ACCURATE BASELINE FOR THE PROJECT

The baseline environmental setting of the SED does not accurately describe the environmental degradation of the Bay-Delta estuary. An "environmental setting," is defined as "the physical environmental conditions in the vicinity of the project."[27] CEQA Guidelines provide that the existing physical conditions in the vicinity of the project "will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant."

The SED's analysis of the environmental conditions in the vicinity of the project fails because the SED bifurcates the Lower San Joaquin River and south Delta salinity standards from the Sacramento River, the Delta, and the associated and inseparable hydrodynamic effects on fish and wildlife. It significantly impairs reasonable analysis of the physical conditions within the vicinity of the project when the scope of the project limits analysis of a water system to only one small piece. Second, the SED does not describe existing physical conditions in the vicinity of the project. While the SED acknowledges that the environmental baseline does not reflect full compliance with existing water quality standards, it does not adequately explore how non-compliance has affected fish and wildlife in the area. In describing the "no project alternative," the Board notes that for purposes of a no project analysis, the assumption is that Lower San Joaquin River flows and southern Delta water quality standards would be fully implemented in accordance with the 2006 Bay-Delta Plan flow and salinity objectives. However, the Board fails to mention that since 2000, DWR and USBR have routinely failed to ensure compliance with their permit/license conditions of southern Delta EC objectives."[28] In 2005, after years of non-compliance with the southern Delta salinity objectives, the Board issued a cease and desist order against DWR and USBR for failure to meet the objectives.[29] Specifically considering that the "objectives were first adopted in the water quality control plan in 1978, and there is evidence that salinity is a factor in limiting crop yields for southern Delta agriculture" the Board declared that it would not extend the deadline to meet the objectives beyond July 1, 2009.[30] However, in 2009, the Board rejected its earlier decision and modified the cease and desist order, eliminating the requirement that DWR and USBR comply with the southern Delta salinity standards until an unnamed date in the future.

The SED, however, makes little mention of this routine non-compliance with the salinity standards in the southern Delta, and describes a "no project alternative" as the "*continuation*" of, and full compliance with, the San Joaquin River flow objectives and the southern Delta salinity objectives identified in D-1641.[31] These omissions are a critical flaw in the description and analysis of baseline conditions, since the public may erroneously believe that current water quality and flow objectives are being met. The SED authors did not follow the relevant professional standards for the types of evaluations they conducted. For example, failure to apply

[27] Cal. Code Regs., tit. 14, § 15125, subd. (a)
[28] WR 2006-0006, Section 4.0, pg. 20
[29] See generally WR 2006-0006
[30] WR 2006-0006, Section 6.0, pg. 27
[31] SED, Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, pg. 8

professional standards when defining the geographic scope of the analysis and failing to address risk and uncertainty, individually, and collectively, render the results fatally flawed.

C. THE SED FAILS TO ANALYZE REASONABLE ALTERNATIVES FOR FLOW OBJECTIVES AND CHOOSES FLOW OBJECTIVES THAT WILL NOT BE PROTECTIVE OF FISH AND WILDLIFE

Previously established water quality and flow objectives have proven inadequate to protect fish and wildlife in the Delta.[32] In 2010 the Board drafted a report entitled *Development of Flow Criteria for the Sacramento –San Joaquin Delta Ecosystem* (hereinafter "Delta Flow Criteria Report" or "2010 Report") in order to develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. The flow criteria developed in the 2010 report were intended to halt population decline and increase populations of certain species and represented the best available fishery and hydrologic science to be had in 2010. Nearly all of the scientists who participated in development of the report agreed that mimicking the natural hydrograph is necessary to improve conditions for native fish species, and to counter invasive species in the Delta. As required by the State Legislature, the Board report included the volume, quality and timing of water necessary for the health of the Delta ecosystem.[33] The report identifies the following criteria for Delta health:

1. 75 percent of unimpaired Delta outflow from January through June;
2. 75 percent of unimpaired Sacramento River inflow from November through June to protect numerous runs of migratory salmon that use the Sacramento River Basin;
3. 60 percent of unimpaired San Joaquin River inflow from February through June to protect juvenile Chinook salmon during their peak emigration period;
4. Increased fall Delta outflow in wet and above normal years;
5. Fall pulse flows on the Sacramento and San Joaquin Rivers to stimulate migrating fish;
6. Flow criteria in the Delta interior to help protect fish from mortality in the central and southern Delta caused by operations of the state and federal water export pumps;
7. 60 percent of 14-day average unimpaired flow at Vernalis;
8. 10-day minimum pulse flow of 3,600 cubic feet per second in late October (e.g., October 15 to 26) at Vernalis;
9. Application of the 2006 Bay-Delta Plan's October flows at Vernalis.[34]

The Board determined that, if these criteria were followed, public trust resources could be protected on the San Joaquin River and throughout the Delta. The basis for these determinations

[32] Id., pgs. 41-98
[33] Water Code § 85086(c).
[34] 2010 Delta Flow Criteria Report, pp. 114-123.

rested on the Board's findings that they would (1) increase juvenile Chinook salmon outmigration survival and abundance and provide conditions that would improve population growth and achieve a doubling of the current salmon population (salmon doubling requirements contained in Section 6900 et seq. of the California Fish and Wildlife Code) and Section 3406 of the CVPIA in more than half of all years; (2) provide flows for adult Chinook salmon that would decrease straying, increase dissolved oxygen concentrations in the San Joaquin River mainstem through the Stockton Deep Water Ship Channel, reduce water temperatures, and improve olfactory homing fidelity; and (3) provide adult Chinook salmon attraction flows.[35] Although the Board qualified its 2010 flow criteria for the San Joaquin River by stating that "these flow criteria do not consider any balancing of public trust resource protection with public interest needs for water," the Board indicates that salmon are the most sensitive species for which it developed public trust-protective flow criteria, as all three of its San Joaquin River inflow criteria directly relate to the sensitivities of salmon populations to changes in and timing of flow through the Bay-Delta Estuary. And yet, despite the extensive background and recent flow recommendations to protect fish and wildlife, the SED largely dismisses the 2010 report and proposes flow objectives for the lower San Joaquin River that are not protective of fish and wildlife.

In the Delta Flow Criteria Report, the Board acknowledges that altering the flows in the lower San Joaquin River to create a more natural flow regime is anticipated to improve a number of ecosystem attributes such as (but not limited to): 1) native fish communities; 2) food web; 3) habitat; 4) geomorphic processes; 5) temperature; and 6) water quality.[36] Major researchers involved in developing ecologically protective flow prescriptions concur that mimicking the unimpaired hydrographic conditions of a river is essential to protecting populations of native aquatic species and promoting natural ecological functions.[37] [38] The San Joaquin River Basin's hydrology has been dramatically altered by water development over the period 1984-2009. In comparing unimpaired with observed (measured) flow conditions for the Basin's rivers, unimpaired flow conditions have been greatly reduced on the major tributaries by water project operations.[39] Annual water flow volumes at Vernalis have reduced over their natural volumes, to 46% of unimpaired flow, while the February through June flow volume have been reduced to a median of 27% of unimpaired.[40] Estimates of flows needed to double salmon production range from 51% to 97% of unimpaired flow; with a greater percentage of unimpaired flow needed in drier years than wet years.[41] And yet, despite the resounding scientific support for using a river's unaltered hydrographic conditions as a foundation for determining ecosystem flow requirements, the SED's proposed flow objectives will do little to improve the conditions for native fish and species.

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[35] 2010 Delta Flow Criteria Report, p. 133, Table 22.

[36] Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, 3-41

[37] Id.

[38] Id.

[39] On the Stanislaus river, actual median flow has fallen relative to unimpaired flows by about 53 percent; on the Tuolumne river, by 74 percent; on the Merced river by 62 percent; and on the Upper San Joaquin River (above the Merced River confluence) by 90 percent.

[40] Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, 3-41

[41] Id. at 3-54

The 2013 SED therefore analyzes four alternatives for flow objectives on the lower San Joaquin River: (1) a no project alternative, (2) 20 percent unimpaired flow, (3) a 40 percent unimpaired flow, and (4) a 60 percent unimpaired flow. The SED describes all the alternatives as "generally consistent with an approach that mimics the natural flow regime to which these fish were adapted."[42] To assess whether it would be possible for the specific flow recommendation that the Board received, the SED compared the flow exceedance curves for the Lower San Joaquin river alternatives 2, 3, and 4 with the different commenters' recommended flow schedules as follows:

1. Contra Costa County Department of Conservation and Development – recommended flow greater than alternative 2;
2. CA Dept. of Fish and Game - recommended flow greater than alternative 2;
3. CWIN/CSPA - recommended flow greater than alternative 2;
4. Bay Institute/National Resource Defense Council - recommended flow greater than alternative 2;
5. American Rivers/Natural Heritage Institute - recommended flow greater than alternative 2;
6. US Dept. of Interior - recommended flow lower than alternative 2;
7. Delta Solution Group - recommended flow greater than alternative 2. [43]

In the Board's 2010 report, *Development of Flow Criteria for the Sacramento –San Joaquin Delta Ecosystem*, the Board determined that approximately 60 percent of unimpaired flow at Vernalis February–June would be fully protective of fish and wildlife beneficial uses in the three eastside tributaries and Lower San Joaquin River when considering flow alone. However, the SED concludes that "the State has determined that 35% of unimpaired flow is required from February through June from each of the Merced, Tuolumne, and Stanislaus Rivers on a 14-day running average, unless otherwise approved by the State Water Board through the adaptive management framework described below." The Board utterly fails to provide a reasoned analysis to justify the reduction in flow for the San Joaquin at Vernalis from the 60 % of unimpaired flow recommended in 2010 to 35 % recommended in the SED. Ambiguities and a lack of crucial information prevent readers of the Draft SED from testing whether the proposed Project and its alternatives can attain the outcomes alleged for them. This 35 % of unimpaired flow objective is not even stated in the amended Table 3 objective in Appendix K of the SED. The Board indicates only that the proposed objective is solely to "maintain flow conditions from the San Joaquin River watershed to the Delta at Vernalis."[44] The Board even fails to state whether or not it used a method to balance the public trust resources, let alone explain what that method was. The Board's proposed water quality objective to govern San Joaquin River flow for fish and wildlife beneficial uses requires only a narrative "value" from February through June in all water years.[45] It proposes to "maintain flow conditions from the San Joaquin River Watershed to the Delta at Vernalis...sufficient to support and maintain the natural production of viable

[42] Id.
[43] SED, Chapter 3, *Alternatives Description* , 3-10
[44] See generally SED, Appendix K, *Revised Water Quality Control Plan*
[45] SED, Appendix K, *Revised Water Quality Control Plan*, pg.1

native San Joaquin River watershed fish populations." No concrete recommendations are given for volume, quality and timing of water necessary to support fish and wildlife, other than to say that the relative magnitude, duration, timing and spatial extent of flows should be correspond to naturally occurring water flows. Under the SED's proposed 35% unimpaired flow, the proposed San Joaquin River flow objectives will be essentially the same as existing flow conditions for the San Joaquin River at Vernalis more than 60% of the time. Therefore, the increase from the current 30% unimpaired flow to the proposed 35% unimpaired flow will result in no net gain of water a majority of the time. The Board seemingly recognizes this, but dismisses it as not significant:

> [T]he time the alternatives are not satisfying the recommendations is offset by the time the alternatives exceed the recommendations. The LSJR alternatives may not satisfy each of the flow recommendations all the time, but the flow schedule-based recommendations are satisfied the majority of the time. Further, adaptive management of flows could increase the amount of time that the flow recommendations are achieved if information indicates that achieving these schedules is more protective of fish and wildlife.[46]

If storage dams on the Stanislaus, Tuolumne, and Merced rivers released 60% of daily unimpaired inflows, calculated on a short-term running average during the months of January through June, the resulting flow-release pattern would closely replicate the natural daily unimpaired flow pattern of each river.[47] In addition, if there was a year-round minimum flow objective of 2000 cfs implemented at Vernalis, it would ensure that at least 1000 cfs passes through the Stockton Deep-water Channel to maintain the dissolved oxygen standard.[48] Further, if the 60% unimpaired flow objective was implemented each January through June for each tributary, flow pulses would more closely match the natural hydrology of each tributary and could easily be synchronized to maximize the overall pulse in the San Joaquin River.[49]

Winter flow pulses provide the natural high-turbidity, high-velocity environment for newly hatched salmon fry to migrate to the Bay-Delta estuary.[50] The Board has recognized that Central Valley fall-run and spring-run Chinook salmon that fry rearing in tidal estuaries including the Bay-Delta is an important life history strategy essential to population production and viability.[51] Therefore, it is important to provide winter (and early spring) pulses and manage Delta operations to create maximum opportunity for fry to reach Suisun Bay. Winter pulses also provide the attraction flows for adult steelhead, and will attract spring Chinook salmon to the Upper San Joaquin River.[52] Further, spring flow pulses are critical for the growth of juvenile

[46] Id. at 3-23
[47] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries,* pg. 4
[48] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries,* pg.4
[49] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries,* pg. 5
[50] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries,* pg. 6
[51] (Appendix C, SWRCB 2012).
[52] Id.

salmon and steelhead rearing in the rivers and for providing enhanced opportunities for juvenile salmon to migrate downstream to and through the Delta to the Bay.[53] These pulses would aid salmon and steelhead passing through the Bay-Delta to reach the ocean.[54] Higher San Joaquin Delta inflow, if allowed to reach the Central and Western Delta as well as Suisun Bay, will also benefit the Bay-Delta ecological food chain by providing more physical space, better water temperatures, protection from predators, and greater food production and availability and sustain conditions for migrating and rearing fishes throughout the system.[55] Spring flow improvements will also enhance spawning, rearing, and migrating conditions for splittail, striped bass, sturgeon, and other fishes, as well as improve water quality of the three tributaries, lower San Joaquin, and the Delta.

Yet, in spite of the many benefits of a 60% unimpaired flow, the Board only recommends a five percent increase in unimpaired flows, meaning the current, poor flow conditions in the Delta will remain during critical time periods for sensitive fish and wildlife. Not only has the Board failed to properly analyze whether its proposed flow objectives will improve the chances of migratory salmon in the San Joaquin River basin, it has failed to undertake and complete the same analysis with respect to estuarine habitat and listed pelagic resident species like longfin smelt and Delta smelt. In effect, the State Water Board has treated the San Joaquin River upstream of Vernalis as an isolated river. It is silent about the fate of fish populations beyond Vernalis that migrate to and through the Delta, and it accomplishes little to increase aquatic life conditions in the San Joaquin River if out-migrating salmon cannot reach Chips Island and the sea. Particle tracking, EC tracking and fish tagging studies all demonstrate that San Joaquin River water and salmon smolts are drawn to the state and federal project pumps. The number of smolts surviving to Chipps Island is in the single digits. There is no equivalent information on fry. The San Joaquin River must be connected to the Bay.

Further, the Board anticipates "no significant or substantial reductions to average annual Delta exports," and little effect on net Delta outflows or the position of X2 for all of the Lower San Joaquin River alternatives.[56] [57] These findings directly contradict the public trust flow requirements that the Board determined were necessary to protect public trust resources in the Bay-Delta Estuary.[58] It is essential that the inadequate fish export facilities in the South Delta be addressed. Even if the Bay-Delta Conservation Plan (BDCP) is ultimately adopted, 50-84% of exports will still come from existing South Delta diversion facilities. BDCP modeling, in the 2012 Effects Analysis on entrainment concludes that South Delta salvage could actually increase for juvenile steelhead (dry & critical years), juvenile Spring-run (above normal & below normal), Fall-run (juvenile in below normal & dry; smolts in all years) and juvenile splittail (all years). Between 2000 and 2011, more than 130 million fish have been salvaged at the South Delta facilities; plus an uncounted number of salmon fry. However, more than a billion fish

[53] Id.
[54] Id.
[55] Id.
[56] SED, p. 5-3, discussion of Impact WS-1 in Table 5-1.
[57] SED, p. 7-8, discussion of Impact AQUA-13 in Table 7-1.
[58] State Water Resources Control Board, *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, Prepared Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009,* August 3, 2010, approved in Resolution No. 2010-0039. ("In accordance with the Delta Reform Act, the State Water Board approves the report determining new flow criteria for the Delta ecosystem that are necessary to protect public trust resources…")

additional fish have been lost during this period. For every 100 salmon entering Clifton Court Forebay, only 6 or 7 ultimately survive. Of course, the losses of eggs and larval stages of pelagic species are 100% and Delta smelt losses approach 100%. It is long past time for the Board to require export agencies to replace the 1950 technology screens.

Existing federal and state law at Section 6900 et seq. of the California Fish and Wildlife Code and Section 3406 of the CVPIA requires the doubling of the natural production of Chinook salmon, from the 1967-1991 average. Yet the SED proposes a narrative objective for salmon that is significantly weaker than the existing objective. The current doubling objective is replaced with a vague requirement to simply provide flows that "reasonably" contribute to maintaining a "viable" population of salmon. Doubling from the 1957-1991 average is a quantifiable standard. "Viable" and "reasonable" are subject to differing interpretations are not quantifiable standards. The proposed objective is also significantly weaker than the 1995 USEPA promulgated salmon migration objective at 40 CFR 131.37. The federal numerical objective is designed to achieve the AFRP doubling goal and establishes a smolt survival index based upon the survival of migrating salmon reaching Chipps Island. Compliance is to be measured by annual fish tag monitoring. While the State Board has long ignored the federal standard, it remains federal law.[59] The SED's failure to acknowledge the elimination of the salmon doubling objective in the present Bay-Delta Water Quality Control Plan coupled with the failure to acknowledge, analyze and discuss the present federal regulations at 40 CFR 131.37 violates basic public disclosure and analytical requirements of CEQA. The SED authors have completely failed to undertake a full comprehensive review of all water quality objectives of the Bay-Delta water quality control plan. More importantly, the Board seemingly dismisses many of the conclusions garnered by the 2010 Delta report. In that report, the Board determined the "species of importance" of the estuary, their relevant life stages, an analysis of both beneficial uses and water quality objectives, and an analysis of times in which water is most important to fish health. [60] Relevant to revising the San Joaquin River flow objectives, the 2010 report noted that:

1. San Joaquin River Chinook salmon smolts outmigrate between March and June;
2. San Joaquin River Chinook salmon eggs and fry are vulnerable to temperature, dissolved oxygen conditions, and barrier predation between October and March;
3. Longfin smelt eggs need fresh to brackish water habitat between December and April;
4. Longfin smelt larvae need fresh to brackish water habitat between December and May;
5. Delta smelt larvae and pre-adults need flows for transport and habitat needs between March and November.[61]

[59] Revised D-1641 failed to incorporate the narrative salmon doubling requirements contained in the 1995 and 2006 Water Quality Control Plan and that there are no equivalent state standards in place to protect the striped bass and splittail spawning and migration beneficial uses in the San Joaquin River comparable to those presently contained in 40 CFR 131.37.
[60] 2010 Delta Flow Criteria Report, Table 2, p. 45-46.
[61] Id.

In disregarding this information, the SED authors justify flow levels that neither protect fish and wildlife beneficial uses in the river nor in the Delta. Instead, the SED authors propose San Joaquin River flow objectives at a percentage of unimpaired flow that maintains or closely approximates the status quo of actual flows in the river. The Board provides no analysis to demonstrate that the Board has balanced the public trust and beneficial uses to arrive at its flow proposal, the Board does little more than advance a flow objective that more easily facilitates water transfers to state and federal water projects to the South.

Appendix K of the SED defines compliance in such a way that flows can be as low as 25% and no more than 45% of February through June unimpaired. A median 35 % of unimpaired flow in February through June will not provide flow magnitudes for productive juvenile rearing habitat or protective emigration habitat in the tributaries, in the San Joaquin, and in the Delta.[62] It will not provide sufficient base flow, flow peaks, or variability to create the benefits that that emulating the natural hydrograph is designed to create. The use of a 14-day running average will further reduce the benefits of a percent-of unimpaired methodology. The flow caps for percent-of-unimpaired diminish the benefits yet again, almost totally limiting floodplain inundation to flood releases. Appendix K of the SED does not define how flow magnitudes and durations will be determined within the effective 25% to 45% water budget, and relies on the creation of an "Implementation Workgroup" and a "Coordinated Operations Group" to determine how those factors will be analyzed and implemented. As described in the SED, adaptive management will be accomplished through the creation of a Coordinated Operations Group (COG) comprised of the Department of Fish and Game, National Marine Fisheries Service and U.S. Fish and Wildlife Service plus representatives of water users on the affected rivers and other representatives deemed appropriate by the State Board's Executive Director. The COG will develop a proposed adaptive management plan for approval by the Executive Director or, depending upon subsequently developed information, the COG may dispense with the unimpaired flow percentage method and, instead, use other management approaches as long as the total quantity of water provided over the entire February through June period is between 25% and 45% of unimpaired flow.

One of the myriad of problems with adaptive management practices are that they are especially vulnerable to funding and political pressure. The SED's failure to identify the specific components and measures of the adaptive management process deprives the public of necessary information upon which to base an opinion of the sufficiency or likely success of implementation and violates the most basic public disclosure, analytical and mitigation requirements of CEQA. The federal Clean Water Act and state Porter-Cologne Act include a built-in mechanism, the triennial or periodic review, for revising water quality regulatory provisions to respond to new scientific information. Although these provisions enable "adaptive management" generally, the EPA supports the idea of the Board's adoption of more explicit scientific experiments in the

[62] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries*, pg. 20

regulatory process.[63] These experiments would need to be scientifically constructed and not likely to adversely affect the aquatic resources being targeted for protection.

Unless specific goals, quantitative objectives, performance measures, milestones and consequences are defined, adaptive management will fail to protect or restore San Joaquin River fisheries. Without public scrutiny, accountability or subsequent environmental analysis, the COG will be able to reduce flows and reservoir storage operations to levels which would likely result in significant and unavoidable impacts that are undisclosed and go unanalyzed in the SED. Only by adopting its public trust Delta inflow and outflow determinations as flow objectives in the Bay-Delta Plan for each major tributary, and applying water rights priorities in that order, can the Board clearly define beneficial and reasonable uses and make appropriate water quality objectives in practical and legally compliant terms. The CWA requires that the protections adopted must be for those beneficial uses that are the most sensitive to impairment from whatever cause. The state's water quality control planning obligations must carry out this responsibility.

D. THE SED FAILS TO ANALYZE REASONABLE ALTERNATIVES FOR SALINITY OBJECTIVES AND CHOOSES SALINITY OBJECTIVES THAT ARE NOT PROTECTIVE OF AGRICULTURE AND FISH AND WILDLIFE

Since 1978, the Board's South Delta salinity objectives regulate salinity concentrations at Vernalis on the lower San Joaquin River and at the interior South Delta monitoring stations at Tracy Boulevard Bridge at Old River, Old River near Middle River, and Brandt Bridge on the San Joaquin River (downstream of the head of Old River). These interior South Delta objectives currently range from 0.7 Electrical Conductivity (EC) during the irrigation season (April 1 through August 31) to 1.0 EC from September 1 through March 31. These objectives have gone unchanged for 35 years. In Water Rights Decision D-1641 (2000) the Board recognized that "the total acreage of lands impacted by rising water tables and increasing salinity is approximately 1 million acres," and the major source of salinity in the San Joaquin River to the South Delta was a result of agricultural drainage generated by lands of the western San Joaquin valley which were irrigated with water exported from the Delta. [64] The Board therefore vested the responsibility for meeting the objectives with the Department of Water Resources and the US Bureau of Reclamation.

In 2011, the most comprehensive study of salinity impacts to Delta agriculture was conducted for the Delta Protection Commission's Economic Sustainability Plan (ESP).[65] The ESP econometric model controlled for a variety of physical (e.g., elevation, soil type,

[63] December 11, 2012 Environmental Protection Agency, Region IX letter to Thomas Howard, Executive Director of the State Water Resources Control Board, *Re: the Comprehensive Review of the Bay-Delta Water Quality Control Plan*, pg. 3.

[64] State Water Resources Control Board 2000: 82

[65] *Economic Sustainability Plan for the Sacramento-San Joaquin Delta*, chapter 7, Agriculture. The choice of irrigation technologies in California. *American Journal of Agricultural Economics* 67: 224-34; Wu, J. and B. A. Babcock. 1998. The choice of tillage, rotation, and soil testing practices: Economic and environmental implications. *American Journal of Agricultural Economics* 80: 494-511; Wu, J., R.M. Adams, C.L. Kling, and K. Tanaka. 2004. From micro-level decisions to landscape changes: An assessment of agricultural conservation policies. *American Journal of Agricultural Economics* 86: 26-41.

temperature, field size, irrigation water salinity) and market variables (e.g., prices) that impact crop choices. The results showed that the salinity of irrigation water had a large and significant effect on planting decisions in the Delta. The ESP model predicts that the degradation in water quality from moving the standard from 0.7 dS/m to 1.0 dS/m could result in agricultural revenue losses of up to $40 million per year in the South Delta. Not incidental, the loss in revenue from this model is due solely to a shift towards lower-value, more salt-tolerant crops and does not include any loss from lower yields.[66] An independent panel of experts for the Delta Science Program reviewed the ESP and praised the agricultural economics work in the ESP as, "well drafted and used appropriate techniques." Regarding the model for measuring salinity impacts, the reviews commented, "We commend the authors for using this approach," and that it was "state of the art."[67] Finally, the California Department of Water Resources chose the ESP model of salinity impacts on Delta agriculture for their analyses of the Bay Delta Conservation Plan.[68] The DWR's adoption of the ESP model shows that DWR recognizes that the ESP model represents the best available science on salinity impacts on Delta agriculture.

Despite the existence of such a thorough and recent study of salinity impacts to Delta agriculture, the SED authors failed to mention it in their analysis of Delta salinity objectives. Further, the SED authors propose objectives that degrade current salinity objectives in the South Delta. The SED analyzes three alternatives for salinity standards: (1) a no project alternative (in which the Board assumes full compliance with all flow and water quality objectives set forth in the 2006 Bay- Delta Plan as implemented through D-1641 and the National Marine Fisheries Service Biological Opinion on the Stanislaus River), (2) a 1.0 dS/m salinity objective, and (3) a 1.4 dS/m salinity objective. The chosen Board alternative (alternative 2) would relax South Delta salinity objectives during the irrigation season (April 1 through August 31). Such a move is in direct conflict with recent Board decisions, and would have the direct effect of reducing the frequency and magnitude of salinity objective violations by the US Bureau of Reclamation and the California Department of Water Resources. The proposed changes suggest that the southern Delta will be protected even if the salinity standards are relaxed. This conclusion is based entirely upon a report by Dr. Hoffman (2010),[69] in which he overestimates leaching fractions to estimate the potential loss to Delta farmers from changes to salinity. His conclusion is that even if salinity standards were relaxed, salt leaching would adequately protect southern Delta agricultural beneficial uses. Unfortunately, Dr. Hoffman collects no field data on Delta agriculture to test the prediction of his hypothesis. He admits that his conclusions rest heavily on results of 30-year old studies of potted bean varieties that commercial growers no longer use. His analysis entirely disregards the time restraints for such crops as alfalfa (irrigation, field dries out, cutting, mowing, raking, baling, next irrigation) that exacerbate farmers' ability to leach salts from the soil, especially on land in which low permeability soils are involved. Most of the Southern Delta agriculture land is between -5 and +10 feet compared to sea level, making the shallow ground water table inextricably linked to the rising and falling tides. Further, this

[66] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 17

[67] Adams, R., J. Chermak, R. Gilbert, T. Harris, and W. Marcuson III. *Independent Panel Review of the Economic Sustainability Plan for the Sacramento-San Joaquin Delta,* December 2, 2011.

[68] See page 3 of the scope of work posted at http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/ICF11_Amend1_finalCombined.sflb.ashx

[69] Hoffman, G. 2010. *Salt Tolerance of Crops in the Southern Sacramento-San Joaquin Delta, Final Report.* Prepared for the California EPA and the State Water Resources Control Board.

shallow ground water contains the accumulation of more than fifty years of salt deposits borne out of the Central Valley Project. Thus, when tides rise and fall, salty ground water rises and falls with it, entering crop root zones. Practically, this means that any salts that are able to leach from the soil do not go anywhere. The SED authors assume that agricultural producers would not replace reduced surface flows by increasing groundwater applications, ignoring how agricultural producers operate.[70] As a result, the SED authors overestimate the negative effects of the flow alternatives on agricultural producers.[71] It is baffling that the SED authors support a degradation of water quality standards based on the untested hypothesis of Dr. Hoffman while ignoring compelling evidence, presented in this critique and elsewhere, that his hypothesis should be rejected.[72]

Adding to the problems with the salinity objective analysis, the SED fails to adequately disclose or analyze the effects of salt loading on the west side of the San Joaquin valley and how salt run-off from those areas contributes to the degradation of water quality in the Delta. In 1981 the White House Council on Environmental Quality found that some 400,000 acres of land in the San Joaquin Valley were poorly drained, and that crop yields had declined 10 percent since 1970. The Council stated that with no action the amount of poorly drained land would increase to about 700,000 acres by 2000. The Council reported too that "over the next 100 years" (or by about 2080) "about 1 million acres of agricultural land in the San Joaquin will undergo desertification" if groundwater salinization is not addressed.[73] The San Joaquin Valley Drainage Monitoring Program reported to the Department of Water Resources for 2005 that there are about 1.324 million acres of land with present and potential drainage problems. Over 30 percent of these lands (or 403,000 acres) have groundwater levels between 0 to 5 feet, while another 65 percent (or 857,000 acres) have water tables between 5 and 15 feet below the surface. All of these lands can be considered to have present and potential drainage problems.[74] Not only are the lands of the western San Joaquin Valley drainage impaired, but the water which is applied to them for irrigation comes largely from the Delta Mendota Canal, which has a relatively high salt content. This "recirculation" of salty water further concentrates salts in the soils and return flows:

> Such recirculation can have a large effect on salt fluxes [i.e., movement] because rather than completely leaving the system, such re-circulated salts continued to contribute to any impairments and costs associated with elevated salinity in supply water. (California Regional Water Quality Control Board 2006: 36)

Echoing the State Water Resources Control Board's finding regarding salts in the Delta, salts in the Delta Mendota Canal are found by the Central Valley Regional Board to be the primary source of salt circulating in the San Joaquin River Basin. While the Canal supplies most of the surface irrigation water to this part of the Basin, the Board states that "the quality of this supply may be impaired by the recirculation of salts from the San Joaquin River to the [Canal's] Delta pumping plant." (California Regional Regional Water Quality Board 2006: 41) In addition

[70] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document*, pg. pg. 9-11
[71] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document*, pg. i
[72] For a more detailed analysis of the problems with Dr. Hoffman's report, see generally Appendix B, ECONorthwest, *Critique of Substitute Environmental Document*, pg. 18-20
[73] Sheridan (1981), pgs. 42-43
[74] California Department of Water Resources, 2010: Table 1

to 1 million tons per year of salt recirculating through the San Joaquin River and the Delta Mendota Canal, the Board estimates that application of salts from soil amendments and groundwater pumping for irrigation in the River Basin adds an additional 500,000 tons of salt per year to the River. This radically changed flow pattern from unimpaired to observed flow in the San Joaquin River Basin changes the Basin's handling of salt circulation as well. According to the California Department of Water Resources, agricultural use of both surface and groundwater sources is the largest source by which salt is mobilized. Adding together groundwater, and surface and subsurface return flows, these sources account for 71 percent of the salt load in the San Joaquin River as measured at Vernalis.

Further, the SED addresses the role of salinity only in the context of the suitability of water for irrigation, and does not consider salinity in terms of its effects on aquatic biota.[75] This omission erases an entire line of analysis that was an important component of earlier SWRCB proceedings on Delta flow and water quality. In examining the spawning of striped bass in the San Joaquin River as far back as 1966-1967, the Board has found that:

> [n]o significant amount of spawning occurred in areas where the total dissolved solids content of the water was above 180 parts per million…TDS values above that level prevented bass from migrating above Stockton in the San Joaquin River…The quality of water in the [Sacramento and San Joaquin) rivers is quite different. In dry years, such as 1966, the flow in the San Joaquin River is greatly reduced and consists largely of irrigation return water having relatively high concentrations of total dissolved solids. In contrast, the Sacramento River is characteristically low in dissolved solids. A dissolved solids gradient is created in the study area by the mixture of water from the two rivers as they are drawn across the central Delta by the U.S. Bureau of Reclamation pumping plant at Tracy, California. The net effect is that water in the San Joaquin River from the study area to its junction with the Sacramento River about 25 miles downstream is primarily Sacramento River water. It is fresher than either the water farther downstream, which is mixed with ocean water, or the San Joaquin River water upstream. Thus, striped bass moving upstream and having made the normal adjustment to fresh water must readjust to more saline water if they continue upstream.[76]

There are a number of fish species in the South Delta and San Joaquin River that, potentially, are adversely affected by salinity: for example, striped bass and splittail. In 1995, the USEPA promulgated standards for a April/May EC objective of 0.44 micro-mhos at Vernalis to protect spawning striped bass and splittail. The USEPA, unlike the current SED, conducted a benefit/cost analysis of the regulatory impacts of the new standards. This economic assessment examined and compared the impacts to agriculture, urban and the regional economy with the

[75] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries*, pg. 20

[76] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries*, pg. 13, citing Farley (1966) and Radtke and Turner (1967)

benefits to the recreational and commercial fisheries and a health ecosystem. [77] However, the SED inexplicably ignores the 1995 federally promulgated salinity standards for striped bass and splittail spawning and migration.[78] These standards established a salinity standard of 0.44 micro-mhos between 1 April and 31 May for Vernalis, Mossdale, Brandt Bridge to Jersey Point when the San Joaquin River index is greater than 2.5 MAF. The SED further fails to adequately acknowledge the importance of protecting salmon fry emergence and migration. Fry migration peaks in January/February/March while smolt migration peaks in April/May and continues into June. While fry are wild, they cannot be tagged or screened. Their demise is one of the most important causes of the collapse of the fishery. Therefore, the percentage of unimpaired flow provided should extend from January to May.

The SED also fails to analyze effects as they relate to freshwater invertebrates, especially their eggs and at sensitive life stages. Zooplankton is a critical source of food to numerous fish species, with different zooplankton species inhabit freshwater, low salinity zones, and/or high salinity zones. In recent years, Native Copepod and Mysid species have plummeted, as well as the entire phytoplankton community. Yet there is no acknowledgement, analysis or discussion in the SED of the potential salinity impacts to the food chain web. With respect to native plant species, the SED identifies listed plants but contains no analysis of the impacts to riparian and channel vegetation in the South Delta or San Joaquin River. Historically, the Southern and Eastern Delta was dominated by freshwater conditions and once supported myriad native freshwater species. A few of these species include common tules (Scirpus acutus, S. californicus), cattails (Typha spp.), common reed (Phragmites communis), swamp knotweed (Polygonum coccineum), marsh bindweed (Calystegia sepium), bur-reed (Sparganium eurycarpum), cinquefoil (Potentilla anserina), twinberry (Lonicera involucrata), dogwood (Cornus stolonifera), buttonwillow (Cephalanthus occidentale), and willows (Salix lasiolepis, S. lucida). This wetland community was once very common and replicas of these communities still can be found on the channel islands and along the waterside of levees. Others grow in the water itself. Several species of native plants, such as the twinberry plant (Lonicera involucrate), are extremely sensitive to salt. Omitting discussion and analysis of salinity standards to protect estuarine habitat for fish and wildlife is an error. In the preamble to its Final Rule for *Water Quality Standards for Surface Waters of the Sacramento and San Joaquin Rivers, and San Francisco Bay and Delta* (1995), the Environmental Protection Agency disapproved of "the absence of salinity standards to protect the Estuarine Habitat and other fish and wildlife uses in the Suisun, San Pablo, and San Francisco Bays and Suisun Marsh, [as well as] the absence of scientifically supportable salinity standards (measured by electrical conductivity) to protect the Fish Spawning uses of the lower San Joaquin River …[79] Although they have gone entirely enforced, the 1995 EPA salinity standards for fish and wildlife have not been rescinded, and it is

[77] United States Environmental Protection Agency, Water Management Division (1993), *Regulatory Impact Assessment of the Proposed Water Quality Standards for the San Francisco Bay/Delta and Critical Habitat Requirements for the Delta Smelt.*

[78] 40 CFR 131.37

[79] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries,* pg. 14, citing EPA's Water Quality Standards regulations at 40 CFR part 131.37; see *Federal Register,* January 24, 1995, p. 4666.

clear that lowering total dissolved solids and salinity in the lower San Joaquin River will more frequently meet the fish spawning objectives adopted by the EPA. [80]

E. THE SED FAILS TO CONTAIN A REQUIRED ANTIDEGRADATION ANALYSIS

The SED's three-page chapter titled *Antidegradation Analysis* briefly describes and references the state and federal antidegradation policies. It states that "[u]nder its dual legal authority, the State Water Board allocates rights to the use of surface water and, together with the nine regional water quality control boards (Regional Water Boards), takes actions to ensure the highest reasonable quality for waters of the state through administration of the Porter-Cologne Act and portions of the CWA."[81] The Federal Antidegradation Policy states that "[t]he antidegradation policy and implementation methods shall, at a minimum, be consistent with the following: (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." [82] EPA Region 9's guidance on implementing antidegradation policy states that "[a]ll actions that could lower water quality in Tier II waters require a determination that existing uses will be fully maintained and protected." [83] The SED states that "Under its dual legal authority, the State Water Board allocates rights to the use of surface water and, together with the nine regional water quality control boards (Regional Water Boards), takes actions to ensure the highest reasonable quality for waters of the state through administration of the Porter-Cologne Act and portions of the CWA."[84]

The CWA requires the full protection of identified beneficial uses. The Federal Antidegradation Policy, as required in 40 CFR 131.12 states, "The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following: (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." EPA Region 9's guidance on implementing antidegradation policy states, "All actions that could lower water quality in Tier II waters require a determination that existing uses will be fully maintained and protected."[85] According to the SED, the Delta and San Joaquin River are Tier II waterbodies, meaning that any revisions to water quality standards for these water bodies must include an antidegradation analysis. Therefore, in order to properly conduct an antidegradation analysis, the Board must first analyze and establish that the proposed standard will remain protective of beneficial uses and then establish that any lower water quality is necessary to accommodate important economic or social development. The SED fails in both regards, as it is entirely devoid of analysis regarding impacts to identified beneficial uses and fails to include a benefit and costs assessment rendering the change necessary to important economic or social development. The antidegradation analysis is so poor that it even fails to

[80] Appendix A, Tom Cannon, *Flow Requirements and other Recommendations to Protect San Joaquin River Fisheries*, pg. 14
[81] SED, Chapter 1, *Introduction*, 1.3, pg. 1-3
[82] 40 CFR 131.12
[83] EPA, Region 9, Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12, page 7.
[84] SED, Chapter 1, *Introduction*, 1.3, pg. 1-3
[85] EPA, Region 9, Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12, page 7.

describe how antidegradation policies are implemented.[86] While the Board may envision updating its antidegradation policy, the present antidegradation policy is valid and binding on this process, and cannot wait for the implementation phase to be analyzed. An antidegradation analysis cannot be conducted for an unpredictable action. Here, the proposed replacements for present water quality standards are less stringent but implementation is spread over years and largely assigned to an undefined adaptive management process with undeterminable results. Further, an antidegradation analysis requires a balancing of the common good similar to a public trust balancing. The common good cannot be "balanced" against uncertain standards and uncertain requirements leading to unknowable outcomes from a vague and undefined adaptive management process. The absence of a defensible antidegradation analysis prevents the public from understanding the nature of the proposed standards and providing informed comments in the public review process, thereby violating CEQA's fair disclosure requirements.

F. THE SED FAILS TO ANALYZE REASONABLE ALTERNATIVES FOR RESERVOIR OPERATIONS THAT WOULD RESPOND TO FLOW OBJECTIVES, AND THUS FAILS TO DISCLOSE POTENTIAL IMPACTS THAT COULD RESULT FROM CHANGES IN STORAGE

The draft water quality objectives for fish and wildlife beneficial uses as shown in the Substitute Environmental Document's (SED) Appendix K do not specify reservoir operations. However, the modeling analysis in the SED assumes that the operators of the major storage reservoirs, when implementing the proposed instream flows on the San Joaquin tributaries, will allow minimal change on reservoir levels and carryover storage. The modeling analysis thus concludes that changes in reservoir levels and carryover storage will have no significant impacts on the environment, including fish and wildlife beneficial uses. This analysis and resulting finding relating to impacts thus depend on at least one of several unsupported assumptions:

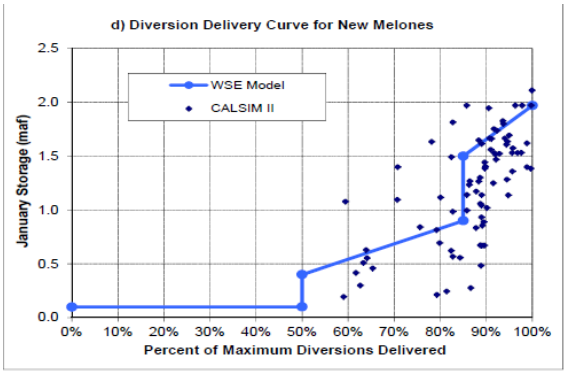
1. That the objectives will require the operators to operate to historic conditions;
2. That the Board can and will in the future write enforceable conditions to require the operators to operate to historic conditions;
3. That in the absence of such explicit enforceable conditions, the operators will in any case operate to historic conditions, even though the San Joaquin Tributaries Authority (SJTA) and Bureau of Reclamation (BOR) have made written and oral statements in this proceeding that operating to historic reservoir levels while implementing new flows would be against the interests of their contractors.

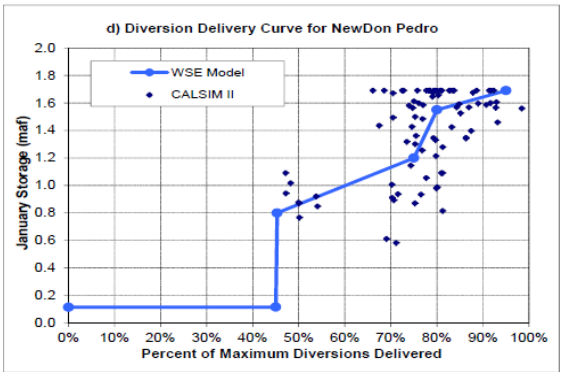
The draft water quality objectives for fish and wildlife beneficial uses assign responsibility for implementation to an Implementation Workgroup and a Coordinated Operations Group. This approach 1) improperly substitutes the unknown future actions of governance structures outside the Board's authority for a definition of the Board's project that allows identification of impacts; 2) does not evaluate reasonably foreseeable impacts to fish, wildlife, water temperatures and hydropower from different reservoir operations; 3) does not allow comparison and evaluation of

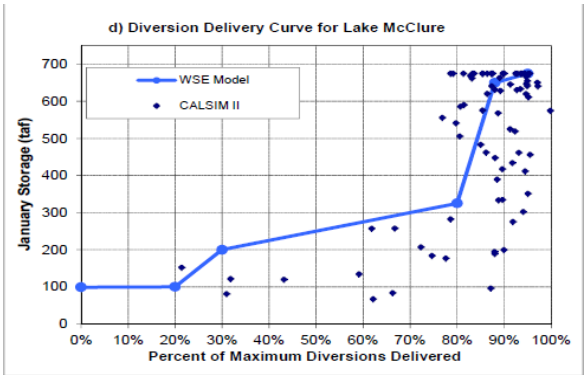
[86] State Water Board's *Administrative Procedures Update on antidegradation analysis* (APU-90-004) or the State Water Board's 1987 guidance memorandum implementing federal antidegradation policy by its then Chief Counsel William Attwater.

the most environmentally protective alternative(s) for reservoir operations to mitigate reasonably foreseeable impacts; and 4) does not allow comparison and evaluation of the costs, benefits and tradeoffs of different reservoir operations to inform reasoned decision making.

The draft water quality objectives set forth in Appendix K of the SED do not set rules for storage in each of the main storage reservoirs on the major San Joaquin tributaries (New Melones on the Stanislaus, New Don Pedro on the Tuolumne, New Exchequer/Lake McClure on the Merced). However, the Water Supply Effects (WSE) model that Board staff used to analyze the effects of different alternatives contains a modeling assumption that assumes that end-of-September storage and end-of-January storage will be very close to historic storage levels. The rule curves for reservoir operations are set forth in Appendix F1, in figures F.1-1 (Stanislaus), F.1-2 (Tuolumne), and F.1-3 (Merced), on pages F.1-21, F.1-22, and F.1-23 respectively. In each respective figure, graph (d) shows the rule curves. Staff provides a narrative description of the application of the rule curves on pages F.1-19 and F.1-20. There are three interrelated major variables in the operation of each major storage reservoir: instream flow releases, diversions, and storage. Each variable affects water available for the others. Staff's modeling assumes different levels of instream flow for various alternatives. The rule curves for each reservoir show the allowed amount of diversion for each tributary for each year as a function of end-of-January storage in the respective storage reservoir. The allowed diversion amounts were calculated based on a regression; the data points from which these regressions were derived are also shown as part of graph (d) of Figures F.1-1, F.1-2 and F.1-3 (below).







Making end-of-January storage define levels of diversion for the subsequent irrigation season contains some simplifying assumptions. The largest and most significant assumption is that precipitation after February 1 of any given year will not be allowed to make up for low storage on January 31. Thus, for instance, in 1982, a year of copious precipitation, the WSE allows diversion levels from the Tuolumne River of less than 80% of maximum because the elevation of New Don Pedro Reservoir on January 31 was less than 1.5 million acre-feet (MAF). This is in spite of the fact that large flood releases from into the Tuolumne downstream of La Grange were made well into July.

One net effect of the simplification of pegging allowed diversions to end-of-January storage is to push the consequences of each water year into the next year. Allowed diversions are based in significant part on precipitation from the previous year. The benefit of a high volume water year is captured in high reservoir carryover storage, which in turn tends to allow high diversion volumes the following year even if precipitation in this second year is low. Another important effect is that it is impossible to analyze the effects of differing flow requirements on a year-to-year basis. Indeed, the SED compares the effects of various flow alternatives on diversions over the entire 80+ year period of record, not by comparing diversions in any given year with the baseline diversions in that year.

The SED's approach to carryover storage appears to stem from the real concern that the SJTA irrigation districts will make up for increased instream flows by making up for as much as they can from storage, and by reducing diversions as little as possible. As the SJTA stated on April 30, 2012, in an unsolicited comment letter from Valerie Kincaid to the Board:

> The implementation of the rule curves would reduce water delivery by pushing water into storage. The effect of pushing water into storage instead of allowing water to be delivered masks the impacts of the proposed regulation to the extent the impacts are measured by reservoir storage. A more realistic depiction of operations would result in impacts in water storage at the reservoirs, in addition to impacts to water delivery. Staff's rule curves result in little to no impact to storage. A completely different outcome would occur if the rule curves recognized that reservoirs will be operated to maximize water deliveries.[87]

The rule curves developed to model the alternatives analyzed in the SED are not explicit as part of the draft water quality objectives to protect fish and wildlife beneficial uses as shown in the SED's Appendix K. So the rule is set on a back door basis as a modeling artifact.

Thus, rather than defining a project, its impacts, and potential mitigations for these impacts in accordance with CEQA, the SED analysis defines the desired result of an impacts analysis while transferring implementation requirements to another entity to meet the desired result. Rather than use the SED to support the project, the SED makes a key finding while requiring undefined future actions to define a project whose very goal is to support this key finding. To compound the problem, the objectives not only do not examine reservoir operational scenarios, they push operations to an "Implementation Workgroup." However, the validity of the SED analysis, which finds no significant impact to fisheries, water temperature, cold water

[87] Letter from Valerie Kincaid to SWRCB, April 30, 2012, p. 4.

availability, and hydropower, relies on the fact that Implementation Workgroup will not modify the rule curve to allow significant effects from changes in storage operations. If the Workgroup were to reduce the carryover storage requirements of these rule curves, several of the SED's findings of no significant impacts would not stand. This approach is doubly flawed: first, it assigns vital decisions to a group external to the Board without guidelines; and second, it bases a finding of no significance on a modeling artifact that the tributary operators in the workgroup are certain to reject.

The SJTA and BOR, in oral presentations to the Board on March 21, 2013, described to the Board many impacts to fisheries, water temperature and hydropower that they argue would occur as a result of Staff's preferred alternative. The vast majority of these impacts stem from changes to reservoir levels. The SJTA and BOR simply cast aside the rule curves for the WSE model, including notably the end-of-September storage target. They modeled the impacts of the preferred alternative according to how they think they might operate if required to release 35% of February - June impaired flow. Though backed by more in-depth analysis of operations, the SJTA and BOR statements of impacts of scenarios also contain within them embedded *choices* of how to manage the variables of storage and diversions. Till now, the rules that SJTA and BOR adopted for their analyses are unknown; all that is known, as stated above, is that they would increase storage withdrawals. It is also unknown how SJTA and BOR might operate under requirements to release different percentages of February – June unimpaired. The SED should have examined a series of potential reservoir operations scenarios and evaluated different impacts to storage as alternatives, by modeling those scenarios with clear modeling assumptions and rules. Then the SED should have analyzed the impacts of those different operational scenarios, including, incrementally, the effects to fisheries, water temperature, cold water availability, hydropower, and other potential categories that may be affected. The SED should have analyzed each of the storage operation scenarios, in turn, with each of the flow alternatives. Such analysis is vital to fulfill the role of the SED in helping decision makers balance impacts and benefits.

The SED should have analyzed the reservoir rule curves as currently modeled in the SED as one *alternative* for reservoir operations (this could have been called the "minimum impact to storage alternative"). The Board should have developed in the draft narrative objectives a narrative standard that described the rule curves, both to describe the alternative and to show that it is feasible. The SED should have analyzed the reservoir operations as generally proposed by the SJTA and the BOR in oral presentations on March 21, 2013 should also be modeled as alternatives (this could be called "the minimum impact to diversions alternative"). It is reasonably foreseeable that, unless explicitly constrained, reservoir operators will draw water out of storage to meet water deliveries of their customers and contractors as much as possible. The SED should have analyzed the impacts of such operation and iteratively used modeling tools to develop intermediate or possibly completely different alternatives for reservoir operations. Staff should have evaluated key metrics to define alternatives. For instance, the presenter from BOR on March 21, 2013 described how reservoir levels that BOR projected under its own proposed operational response to the preferred flow alternative would threaten the 15% reserve margin for power reliability required by the North American Electricity Reliability Corporation and the Western Electricity Coordinating Council. Staff might have considered a potential violation of the reserve margin as metric in developing reservoir operations scenarios.

In summary, the SED should have developed a suite of alternatives for reservoir operations and analyzed the impacts of flow alternatives under these different reservoir operation scenarios using clearly defined quantifiable and enforceable rules. By failing to conduct this analysis, the SED has allowed the SJTA and BOR to present competing versions of operations, and to argue that their modeling is more credible than Staff's. These dueling models and dueling impacts analyses defeat the purpose of environmental review: to support clear and reasoned decision making.

G. THE SED FAILS TO CONDUCT A PROFESSIONAL ECONOMIC ANALYSIS

Economics is the study of how societies use scarce resources to produce valuable goods and services and distribute them among different individuals.[88] The scarce resource the Board must allocate among competing demands is the San Joaquin River and, more specifically, the quantity and quality of its waters.[89] When the *SED Report*'s authors state they have "evaluated a number of different 2006 Bay-Delta-Plan amendment alternatives for State Water Board consideration"[90] and their "economic analysis … will help inform State Water Board's consideration of potential changes … related to LSJR flows and southern Delta water quality objectives,"[91] they appear to have adopted the approach emedded in the definition of economics: "If you were asked to evaluate the desirability of some proposed action, you would probably begin by attempting to identify both the gains and the losses from that action. If the gains exceed the losses, then it seems natural to support the action."[92] [93] Identifying "the gains and the losses" begins by grouping the gains and losses—the economic effects—into three categories: economic values, economic impacts, and economic equity.[94] For evaluating "the desirability of some proposed action," "[n]ormative economics considers 'what ought to be'—value judgments, or goals, or public policy"[95] whereas "[p]ositive economics…is the analysis of facts and behavior in an economy, or 'the way things are'."[96]

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[88] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 1, citing Samuelson, PA and WD Nordhaus. 2010. *Microeconomics,* 19th ed. New York: McGraw-Hill Irwin, p.4. Dr. Samuelson was a Nobel laureate in economics and Institute Professor at MIT. Dr. Nordhaus is Sterling Professor of economics at Yale University. For similar definitions of economics, see practically any other introductory economics textbook, as well as Pearce's MIT Dictionary of Economics, Pearce, DW, ed. 1992. *The MIT Dictionary of Modern Economics*, 4th ed. Cambridge: The MIT Press, p.121.

[89] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 1

[90] *SED,* p.ES-2

[91] *SED, Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation*, Chapter 18, p.18-2.

[92] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 2

[93] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 2 citing Tietenberg and Lewis, p.46.

[94] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 2 citing Appendix C, ECONorthwest. 2013. *Bay-Delta Water: Economics of Choice*.

[95] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 3 citing Samuelson, P.A. and W. Nordhaus. 2005. *Economics,* 18th ed. New York: McGraw-Hill Irwin. p. 746. Dr. Samuelson, Nobel laureate in economics and Institute Professor at MIT, died in 2009. Dr. Nordhaus is Sterling Professor of economics at Yale University.

[96] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 3 citing Samuelson and Nordhaus. 2005. p. 746.

Under CEQA, project-related social or economic effects are not, as a general rule, required to be analyzed; however, a lead agency may decide to include an assessment of economic or social effects in an EIR, particularly if these effects are perceived as being important or substantial. As discussed in Section 15131 of the Guidelines for Implementation of the California Environmental Quality Act (CEQA Guidelines), economic or social information may be included in an EIR in whatever form a lead agency desires. However, Water Code Section 13241 states that "economic considerations" *should* be considered in establishing water quality objectives. Compliance with these statutory provisions typically involves quantifying the costs to affected parties (e.g., farmers and water districts), and assessing potential impacts on affected local and regional economies of related changes in economic activity.[97]

The SED uses IMPLAN for economic modeling, which is described as "the most widely used economic input-output model for assessing regional economic impacts of regulatory and policy actions."[98] The SED authors used an IMPLAN-based model of the Madera, Merced, and Stanislaus counties to represent the larger agricultural area in the lower San Joaquin River watershed.[99] However, in the context of the *SED Report*, the results from IMPLAN's snapshot overestimate the negative economic impacts of the flow alternatives:

> Input-output analysis approach employed by IMPLAN usually overestimates indirect job and income losses. One of the fundamental assumptions in input-output analysis is that trading patterns between industries are fixed. This assumption implies that suppliers always cut production and lay off workers in proportion to the amount of product supplied to farms or other industries reducing production. In reality, businesses are always adapting to changing conditions. When a farm cuts back production, some suppliers would be able to make up part of their losses in business by finding mew markets in other areas. Growth in other parts of the local economy is expected to provide opportunities for these firms. For these and other reasons, job and income losses estimated using input-output analysis should often be treated as upper limits on the actual losses expected (SWRCB 1999)."[100]

Even though the Board acknowledges that their IMPLAN analysis overstates the true employment and income impacts of the flow alternatives, they apparently ignored this fact when selecting their preferred alternative of 35 percent unimpaired flows.[101] The Board compounded or magnified the "worst case" results from their SWAP analysis by using the SWAP results as input into their IMPLAN analysis, which also produced its own "worst case" output.[102]

Assuming for the sake of argument that the SED's IMPLAN results reflect the economic impacts of the flow alternatives, the employment impacts of even the 60 percent flow alternative represents a negligible portion of total employment in the affected counties.[103] The negative

[97] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. pg. 4
[98] SED, *Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation*, Chapter 18, 18-20.
[99] Id.
[100] SED 2012, page G-29.
[101] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 13-14
[102] Id.
[103] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 14

employment impacts of the 60 percent flow alternative of 1,432 represent just 0.4 percent of the total. The *SED Report* admits these losses are exaggerated. A more reasonable estimate of economic losses is likely to be less than half the amount estimated in the *SED*, which would represent approximately 0.2 percent of the counties' economies.[104] If the SED was to include San Joaquin County,[105] the negative employment impacts of the 60 percent flow alternative represent just 0.23 percent of the four counties' total employment of 625,178.[106] Halved to be more reasonable, this represents approximately 0.1 percent of the counties' economies.[107] These results offer no support of the Board's preferred flow alternative, 35-percent unimpaired flow. The available evidence supports a preferred alternative closer to, if not, the 60-percent flow alternative.

H. THE SED FAILS TO ADEQUATELY DESCRIBE THE IMPACTS OF ITS CHOSEN ALTERNATIVES FOR BOTH THE LOWER SAN JOAQUIN RIVER FLOW OBJECTIVE AND THE SOUTH DELTA SALINITY OBJECTIVES

The fundamental flaw with the Board's analysis of the project impacts is that the Board has failed to analyze the entire project. Information concerning flow needs of fish and wildlife beneficial uses in the San Joaquin river basin was used by the Board to develop a range of potential San Joaquin river flow alternatives to protect fish and wildlife beneficial uses. The Board acknowledges that "while aquatic resources in the SJR basin have been adversely impacted by numerous factors, flow remains a key factor and is the focus of the State Water Board's current review."[108] However, the Board notes that the alternatives chosen do not necessarily represent the alternatives that will be evaluated in the SED, which was prepared in support of potential amendments to the SJR flow objectives in the Bay-Delta Plan, and not necessarily in support of flow objectives to protect fish and wildlife.[109] The ranges of alternatives presented in the SED are based on minimum flow requirements of 20%, 40%, and 60% of unimpaired flow from the SJR tributaries during the months of February through June.[110] The Board's chosen alternative, a 35% unimpaired flow, falls in the range of 20%-40%, meaning that depending on the time of year, unimpaired flow can fall substantially below the 35% average unimpaired annual flow. The Board fails to provide an analysis to justify the reduction in flow for the San Joaquin at Vernalis from the 60 % of unimpaired flow recommended in 2010 to 35 % recommended in the SED. The Board gives little to no explanation for its determination that 35

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[104] Id.

[105] This is a reasonable addition, because economic impacts of a flow alternative would be felt in San Joaquin County, where South San Joaquin Irrigation District and Stockton East Water District are located. In addition to the farms themselves, most of the labor force and input suppliers for farms in these districts will be located in San Joaquin County, primarily Stockton, which also is the primary location of workforce and suppliers for farms within the South Delta Water Agency territory.

[106] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document,* pg. 14

[107] Id.

[108] SED, Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, 3-1

[109] SED, Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, 3-13

[110] SED, Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, pg. 1-3

% of unimpaired river flow will improve or protect the fish and wildlife in the Bay Delta estuary. Further a 35% unimpaired flow is not explicitly analyzed in the preceding chapters of this SED, and there is no discussion of how or why 35% was selected. Instead, the Preferred LSJR Alternative falls within the range of alternatives analyzed in those chapters (20-60 percent of unimpaired flows) and is, accordingly, "encompassed by those analyses." [111]

A number of other factors (e.g., non-native species, exposure to contaminants, nutrient loading, climate change) require evaluation as potential contributors to the degradation of fish and wildlife beneficial uses in the SJR basin and Delta. Even with a full description of individual impacts of lower San Joaquin River flows and south Delta salinity objectives, the SED cannot possibly disclose, much less analyze, the individual impacts of the project when it limits the project to such a small portion of the water system. For example, the Draft SED finds that the revised San Joaquin River flow and South Delta salinity objectives will not affect state and federal exports and will have no change to Delta outflows or the size of X2. Yet, the Board makes these findings without analyzing water quality objectives for Sacramento River inflows, changes to export/inflow ratios, Delta Cross Channel closure objectives, Suisun Marsh objectives, Old and Middle River reverse flow objectives, or other changes to water quality objectives that are reasonably foreseeable impacts to the water feeding into, and coming out of, the area they are analyzing in Phase I of their project analysis.

Further, federal Clean Water Act regulations require that water quality objectives be set so as to protect the most sensitive beneficial use in the water body, however the Board's proposed San Joaquin River flow objectives do not achieve the necessary protection. Instead, the Board narrowly focuses on how it regulates San Joaquin River flow at Vernalis, and seeks to maintain existing conditions that fail to protect the pelagic and migratory beneficial uses of fish and wildlife, rather than improve or increase the protection for these beneficial uses.[112]

III. THE SED DOES NOT COMPLY WITH THE REQUIREMENTS OF THE CLEAN WATER ACT

The primary purpose of water quality control planning under the CWA is to prepare or develop comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable water and ground waters and improving the sanitary condition of surface and underground waters. In the development of such comprehensive programs, "due regard shall be given to the improvements which are necessary to conserve such waters for the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such waters for public water supply, agricultural, industrial, and other purposes."[113] The Board fails to consider new water quality objectives for the most sensitive beneficial uses in the Bay-Delta Estuary under the federal CWA and its implementing regulations administered by the US Environmental Protection Agency (hereinafter "EPA.") The goals of the CWA include restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters through the elimination of discharged pollutants; protecting and propagating fish, shellfish, and wildlife; prohibiting discharge of toxic pollutants; and to recognize, preserve, and protect the primary

[111] SED, Chapter 20, *Preferred LSJR Alternative and SDWQ Alternative*, pg.20-1
[112] Draft SED, p. 2-13.
[113] 33 USC § 1252

responsibilities and rights of states to prevent, reduce, and eliminate pollution, plan the restoration, preservation, and enhancement of land and water resources. Research priorities funded under the CWA are intended to foster prevention, reduction and elimination of pollution in the waters of the United States. The heart of water quality control under these laws is first the designation of the beneficial uses to be protected, and second the setting of standards, criteria, and objectives that provide reasonable protection for those beneficial uses.

The Board is obligated by the CWA to operate a "continuing planning process," by which the Board submits any revisions or new water quality standards to the EPA Administrator for review. Such standards are to consist of "designated uses" and water quality criteria or objectives that represent the level of protection for the beneficial use. These standards are intended to protect the public health and enhance water quality while taking into consideration the needs of public water supplies, fish and wildlife, recreation, and agricultural and industrial uses.[114] Under Porter-Cologne, beneficial uses may include domestic, municipal, agricultural and industrial water supplies; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.[115] Since 1991, the Board has designated 17 specific beneficial uses of water in its Bay-Delta Estuary water quality control plans, including recreation and preservation and enhancement of fish and wildlife resources.[116] [117] Thus, in determining the amount of water available for appropriation, the board must take into account the amount of water needed to remain in the source for protection of beneficial uses.[118] Despite this charge, the State Water Resources Control Board does not use its water quality control powers to materially improve water quality in the South Delta and the lower San Joaquin River. On the contrary, the Board's proposed actions would relax existing standards and maintain insufficient flow objectives for fish and wildlife, diminishing water quality and further harming the Delta.

The SED recommends a flow objective for the San Joaquin River of 35 % of unimpaired flow that is well below the 60 % flow that the Board identified in 2010 as protective of fish and wildlife. The SED should have first identified the various water demands for beneficial uses, which of the beneficial uses are the most sensitive, the increment of flows available for riparian and appropriative consumptive use, and then proposed flow objectives in accordance with those findings. Yet, the Board failed to comply with this method at each step. First, the Board has not designated beneficial uses for which its proposed South Delta salinity objective are intended to

[114] 33 U.S.C. 1313 (c)(2)(A). ("Enhance" means to "intensify, increase, or further improve the quality, value, or extent of" something. One meaning of "propagate" is to "cause (something) to increase in number or amount." "Restore" can mean to "return (someone or something) to a former condition, place, or position.") In general, the plain language of Clean Water Act policies on protection of beneficial uses is not merely intended to maintain water quality but to increase or improve water quality as well as to return water quality to former conditions of chemical, physical, and biological integrity.

[115] California Water Code §13050(f)

[116] These beneficial uses include: municipal and domestic supply, industrial service supply, industrial process supply, agricultural supply, groundwater recharge, navigation, contact and non-contact water recreation, shellfish harvesting, commercial and sport fishing, warm fresh water habitat, cold fresh water habitat, migration of aquatic organisms, spawning, reproduction and/or early development of fish, estuarine habitat, wildlife habitat, and rare, threatened or endangered species' habitats.

[117] California Water Code §1243

[118] California Water Code Section §1243.5

protect. Second, the Board proposes San Joaquin River flow objectives that maintain the status quo, albeit through a new method of regulation. Third, the Board fails to include an analysis of water availability or to take full account of competing demands for water from all beneficial uses in that context. Finally, the Board fails to address water quality as it relates to dissolved oxygen standards or to temperature. Old River experiences frequent fish kills caused by low dissolved oxygen, which has long been known to the Regional Board.[119] Dissolved oxygen results collected at the real time monitoring station in Old River at Tracy Wildlife Association reveals that dissolved oxygen levels cycled as low as 0.5 mg/l mid-April through mid-August of 2012. Specific dissolved oxygen standards need to be established in Old River to protect beneficial uses.

In order to begin to mimic natural hydrologic conditions in the estuary, water temperature must be taken into account. Despite this logical analysis, the SED fails to propose any objectives to protect the identified beneficial uses of cold fresh water habitat; migration of aquatic organisms; spawning, reproduction and/or early development of fish; and rare, threatened or endangered species' habitats from elevated temperatures. The San Joaquin River (Merced to Delta boundary), the lower Stanislaus, the lower Tuolumne and the lower Merced Rivers are identified by the CWA as impaired waterbodies because of elevated temperatures.[120] The SED analyzed the impacts resulting from changes in exposure of fish to stressful water temperatures (AQUA-4) of each of the alternatives and concluded that lower unimpaired flow increased significant impacts while increased flows decreased impacts. While CEQA is served by a comparison of the relative significant impacts between the considered alternatives, the federal CWA is not. The SED is reviewing a water quality control plan developed pursuant to the CWA, and the CWA requires the protection of identified beneficial uses.

Under modeled baseline conditions, water temperatures potentially causing thermal stress in rearing and outmigrating juvenile salmon and steelhead frequently occur during the spring months on the Stanislaus, Tuolumne, and Merced Rivers as well as in the lower San Joaquin River. In the summer, flows met the USEPA recommended criterion for summer rearing <10 - 40% of the time and exceeded lethal levels <10% of the time in the Stanislaus and Merced Rivers. Water temperatures suitable for adult salmon and steelhead migration in September were exceeded in the lower San Joaquin River and major tributaries. In the lower San Joaquin River, temperatures potentially causing mortality or creating a migration barrier for adult salmon in September occurred greater than 90% of the time. Suitable temperatures for Chinook salmon spawning and incubation in the Stanislaus, Tuolumne, and Merced Rivers generally did not occur until late October or November. In October, spawning and incubation criterion were met 50% of the time in the Tuolumne River and 10% of the time in the Stanislaus and Merced Rivers. In November, spawning and incubation criterion were met 70% of the time in the Tuolumne River and 40-50% of the time in the Stanislaus and Merced Rivers. Water temperatures exceeding lethal levels for Chinook salmon spawning and incubation would occur <10-30% of the time in October and <10% of the time in November in the Stanislaus, Tuolumne and Merced Rivers. For the lower San Joaquin River, temperatures exceeded lethal levels for Chinook salmon spawning and incubation >90% of the time in October and <20% in

[119] Several years ago, CSPA took Regional Board staff (including Mark Gowdy) on a trip on Old River and showed them a massive fish kill caused be anoxic conditions.
[120] CWA Section 303(d); SED, Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*, pg. 5-13

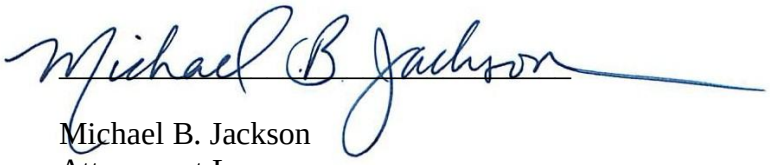
November.[121] Under the SED flow objective Alternative 2 (20% unimpaired flow), the percentage of temperatures exceeding USEPA criterion in the lower San Joaquin, Stanislaus, Tuolumne and Merced Rivers increased.[122] Under Alternative 3 (40% unimpaired flow), while the percentage of temperatures exceeding USEPA criterion decreased from baseline, significant exceedances still existed. [123] Under Alternative 4 (60% unimpaired flow), the percentage of temperature exceeding USEPA criterion further decreased, however exceedances still existed.[124]

Despite the San Joaquin, Stanislaus, Tuolumne and Merced Rivers being listed as impaired waterbodies due to elevated temperatures, and despite temperatures on these rivers exceeding USEPA criterion, there are no proposed objectives in the SED to protect the identified beneficial uses of cold fresh water habitat; migration of aquatic organisms; spawning, reproduction and/or early development of fish; and rare, threatened or endangered species' habitats from elevated temperatures. This fails to comply with the requirements of the federal CWA.

IV. CONCLUSION

Central Valley waterways are so polluted and fisheries so seriously depleted that immediate action to protect these resources must be implemented. Despite the long existence of prohibitions in the state Constitution against the unreasonable use and diversion of water, the Water Code, the public trust doctrine, state and federal endangered species acts, water quality acts, Fish & Game code, and Central Valley Project Improvement Act, the lists of impaired waterways and endangered species lengthen decade by decade. The SED report is so replete with errors of omission and commission, that some alone compromise the entire report. The cumulative errors of the SED, taken together, simply beg too many questions across too many parts of the SED Report for it to meet basic professional standards.[125] Rather than disclose the evidence-based reasoning that led them from the alternatives (for flows and water quality), the SED authors merely identify the alternatives they prefer. This not only fails to inform the Board adequately, but utterly fails to inform the public.

Very Truly Yours,



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Attachments: Appendix A - C

[121] SED, Chapter 7, *Aquatic Resources*, pg. 7-89.
[122] SED, Chapter 7, *Aquatic Resources*, pgs. 7-90 through 7-94.
[123] SED, Chapter 7, *Aquatic Resources*, pgs. 7-94 through 7-98.
[124] SED, Chapter 7, *Aquatic Resources*, pgs. 7-98 through 7-101.
[125] Appendix B, ECONorthwest, *Critique of Substitute Environmental Document*, pg. 3