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Re: Notice of Intent and Scoping under the National Environmental Policy Act on Remanded Biological Opinions on the Coordinated Long-term Operation of the Central Valley Project and State Water Project

Dear Ms. Piñero:

The State Water Contractors ("SWC"), San Luis & Delta-Mendota Water Authority ("SLDMWA"), and Westlands Water District ("Westlands") (collectively, "Public Water Agencies") appreciate the opportunity to comment in response to the Bureau of Reclamation's ("Reclamation") notice of intent to prepare an environmental impact statement ("EIS") and notice of scoping meetings, published in the Federal Register on March 28, 2012 ("NOI").

The NOI comes in response to rulings by the United States District Court in the *Consolidated Delta Smelt Cases* and *Consolidated Salmonid Cases*. The court found that the existing biological opinions regarding continued operation of the Central Valley Project ("CVP") and State Water Project ("SWP") are unlawful, and that new biological opinions are required. The court further found that Reclamation violated the National Environmental Policy Act ("NEPA") when it adopted and implemented major changes to project operations pursuant to those unlawful biological opinions, changes that caused significant adverse effects on the quality of the human environment, without doing any NEPA review.

Reclamation must now reconsider whether and how the continued operations of the CVP and SWP should be modified to ensure compliance with the federal Endangered Species Act ("ESA"). Before it can finally decide that issue, Reclamation must complete a new consultation under section 7 of the federal ESA regarding each listed species affected by project operations. Such consultation will require Reclamation and the California Department of Water Resources ("DWR") to prepare a new biological assessment describing the proposed CVP and SWP operations. The proposed project operations will be materially different from the operations

described in the 2008 biological assessment. Among other changes, the description of operations must include implementation of the San Joaquin River Restoration Program, the Bay Delta Conservation Plan, and new Water Quality Objectives related to San Joaquin River flow. In addition, it should include operations allowing greater opportunities to "transfer" water through the Delta. The new biological assessment and new biological opinions must also reflect new scientific data that has become available since 2008. These data include information related to the adverse impacts caused by nutrients discharged from wastewater treatment plants, the adverse, extra-ordinary impacts of predation, the lack of identifiable adverse impact of pumping by the CVP and SWP, and the lack of identifiable adverse impact associated with changes in the location of X2 during the fall months. The changes in operations and additional scientific data will require new analyses of the effects of project operations. The Public Water Agencies submit that these new analyses should ultimately result in significantly different conclusions regarding the effects of CVP and SWP operations on listed species, and a different decision by Reclamation, than occurred in 2008 and 2009.

As far as we are aware, Reclamation has not yet prepared a biological assessment for the consultation. Reflecting the still incomplete ESA consultation process, the NOI does not define a proposed action for NEPA purposes. The NOI suggests that the proposed action may include unspecified specified "operational components" of the existing biological opinions. The proposed action should not, and presumably will not, include components of the existing opinions found to be unlawful. Since the NOI does not identify a proposed action, it logically could not and indeed does not identify any possible alternatives to such a proposed action.

Reclamation is now at the scoping stage of the NEPA process. Scoping is defined in the Council on Environmental Quality ("CEQ") regulations as "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." 40 C.F.R. § 1501.7. Reclamation has already conducted five public scoping meetings. We appreciate Reclamation's addition of the May 22, 2012 public meeting in Los Banos, which allowed interested parties in that region an opportunity to provide direct input regarding issues that should be addressed in any EIS. Likewise we appreciate Reclamation's action in extending the deadline for written comments in response to the NOI to June 28, 2012.

As part of the scoping process, Reclamation must "[d]etermine the scope (§1508.25) and the significant issues to be analyzed in depth in the environmental impact statement." *Id.* "Scope consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement." 40 C.F.R. § 1508.25. The Public Water Agencies hope to work in a cooperative manner with Reclamation to ensure that the planned EIS addresses the significant issues that arise from potential modifications of project operations pursuant to the ESA, and that the EIS document includes an appropriate range of actions, alternatives and related impacts.[1] The incomplete and preliminary information in the NOI regarding the proposed action

[1] The Public Water Agencies also recognize the close relationship between the NEPA process and the related ESA consultation process. As explained in the Reclamation Stakeholder Engagement Process ("RSEP") for Section 7 ESA Consultation and NEPA Compliance on the Remanded Biological Opinions on the Coordinated Long-term Operation of the Central Valley Project and State Water Project, issued June 2, 2012 (p. 2), "Reclamation anticipates a free and complete flow of information between the NEPA and Section 7 consultation processes, with each informing the other."

necessarily limits the ability of the Public Water Agencies to provide responsive scoping comments here. As the ESA consultation progresses, including particularly preparation of a new biological assessment, Reclamation should likewise be able to define a proposed action and possible alternatives to be included in its NEPA analysis. The Public Water Agencies request an opportunity to provide additional comments when and as Reclamation does so. Reclamation's NEPA analysis ultimately should help foster a workable, environmentally sound plan for continued operations of the CVP and SWP that will minimize adverse socioeconomic and environmental impacts while ensuring legally and scientifically supportable, reasonable, and effective protection mechanisms for the listed species.

I. THE STATE WATER CONTRACTORS, SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, AND WESTLANDS WATER DISTRICT

The SWC organization is a nonprofit mutual benefit corporation that represents and protects the common interests of its 27 member public agencies in the vital water supplies provided by California's SWP. Each of the member agencies of the State Water Contractors holds a contract with DWR to receive water supplies from the SWP. Collectively, the State Water Contractors' members deliver water to more than 25 million residents throughout the state and to more than 750,000 acres of agricultural lands. SWP water is served in the San Francisco Bay Area, the San Joaquin Valley and the Central Coast, and Southern California. The complete list of SWC member agencies is set forth in the attached Exhibit A.

SLDMWA is a joint powers authority, established under California's Joint Exercise of Powers Act. Gov. Code, § 6500 et seq. SLDMWA is comprised of 29 member agencies, 27 of which hold contractual rights to water from the federal CVP. SLDMWA member agencies have historically received up to 3,100,000 acre-feet annually of CVP water for the irrigation of highly productive farm land, primarily along the San Joaquin Valley's Westside, for municipal and industrial uses, including within California's Silicon Valley, and for publicly and privately managed wetlands situated in the Pacific Flyway. The areas served by SLDMWA's member agencies span portions of seven counties encompassing about 3,300 square miles, an area roughly the size of Rhode Island and Delaware combined. The complete list of the San Luis & Delta-Mendota Water Authority's members is set forth in the attached Exhibit A.

Westlands Water District is a member agency of SLDMWA. Westlands is a California water district formed pursuant to California Water Code sections 34000 *et seq*. Westlands holds vested contractual water rights to receive water from Reclamation, through the San Luis Unit of the CVP, for distribution and consumption within areas of Fresno and Kings Counties. Westlands' total contractual entitlement for CVP water under this contract is 1.15 million acre-feet per year. In addition, Westlands holds 43,500 acre-feet of water entitlement in the form of contract assignments from other districts including Broadview Water District, Centinella Water District, Widren Water District, and Oro Loma Water District. Most of this CVP water supply is used for irrigation. Westlands encompasses approximately 600,000 acres, including some of the most productive agricultural lands in the world.

Each of these entities, their member agencies, their customers, and others within their service areas may experience significant adverse impacts as a result of actions that may follow

from the ongoing ESA consultations. Accordingly, the Public Water Agencies believe it is vital that they participate actively in the NEPA review process, to ensure that such the environmental and socioeconomic impacts its member agencies and customers could experience from any further water limitations are fully disclosed and analyzed, and that policy makers and the public be fully informed regarding the choices to be made.

II. COOPERATING AGENCIES

The NOI states that Reclamation has identified State and local agencies "as potential cooperating agencies," and that it "will invite then to participate as such in the near future." In a letter dated August 19, 2011, Commissioner Mike Connor indicated that the SLDMWA and SWC will be deemed cooperating agencies for this NEPA process, with specific responsibilities to be set forth in a memorandum of understanding. In the same letter, Commissioner Connor indicated that the SLDMWA and SWC would be deemed designated non-Federal representatives in the related section 7 consultation. The SLDMWA and SWC look forward to working with Reclamation in these capacities. Including the SLDMWA and SWC in these roles will further the statutorily mandated policy of Section 2(c)(2) of the ESA, which requires federal agencies to "cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species." 16 U.S.C. § 1531(c)(2). In addition, it may be appropriate for other local public agencies that are members of the SLDMWA or SWC to serve as cooperating agencies, including Westlands, The Metropolitan Water District of Southern California, the Kern County Water Agency, and Santa Clara Valley Water District.[2] Several member agencies will be contacting Reclamation regarding cooperating agency status.

According to the CEQ's regulations, cooperating agencies, on request from the lead agency, assume responsibilities for developing information and preparing environmental analyses using the cooperating agency's funds. 40 C.F.R. § 1501.6(b)(3), (b)(5). This role is also recognized in Reclamation's NEPA Handbook (Feb. 2012) at section 8.10.2.

As recommended by Reclamation's NEPA Handbook, a Memorandum of Understanding ("MOU") should be negotiated concerning the roles of the Public Water Agencies and perhaps other agencies as cooperating agencies. We therefore request that a timely meeting be scheduled with you and/or other appropriate Reclamation representatives to clarify the scope of involvement in the environmental review as cooperating agencies.

III. RECLAMATION'S TASK ON REMAND FROM THE DISTRICT COURT

The NOI identifies and briefly describes the outcome of litigation as the reason Reclamation is now undertaking NEPA review. (See discussion under heading "II. Why We Are Taking This Action.") In order to frame the parameters of Reclamation's NEPA review, it is useful to briefly recount the district court's rulings and what they require.

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[2] The NOI states that the State and Federal Contractors Water Agency may be invited to participate as a cooperating agency. The SWC does not agree that SFCWA should serve as a cooperating agency.

A. The ESA Rulings

First, with respect to the requirements of the ESA, the district court found that both the U.S. Fish and Wildlife Service ("FWS") and the National Marine Fisheries Service ("NMFS") BiOps were arbitrary, capricious, or contrary to law. These flaws were so fundamental that Reclamation should not have any expectation that after reconsultation the next biological opinions will necessarily be similar to the last biological opinions in their conclusions or in any measures they may impose. By way of example, in the *Consolidated Delta Smelt Cases*, the district court found the following errors:

- "The BiOp's reliance on analyses using raw salvage figure to set the upper and lower OMR flow limits of Actions 1, 2, and 3 was arbitrary and capricious and represents a failure to use the best available science. Actions 1, 2, and 3 depend so heavily on these flawed analyses that this failure is not harmless." *Consolidated Delta Smelt Cases*, 760 F. Supp. 2d 855, 968 (E.D. Cal. 2010).
- "Comparison of Calsim II to Dayflow model runs created potentially material bias in the BiOp's evaluation of the impacts of Project operations on the position of X2 and related conclusions regarding population dynamics and habitat. FWS's failure to address or explain this material bias represents a failure to consider and evaluate a relevant factor and violates the ESA and APA." *Id.* at 968.
- "The flawed Calsim II to Dayflow comparison fatally taints the justification provided for Action 4." *Id.* at 968.
- "The BiOp has failed to sufficiently explain why maintaining X2 at 74 km (following wet years) and 81 km (following above normal years), respectively, as opposed to any other specific location, is essential to avoid jeopardy and/or adverse modification." *Id.* at 969.
- "[T]he analyses supporting the specific flow prescriptions set forth in the RPA are fatally flawed and predominantly unsupported. The BiOp does not justify or explain its attribution to Project operations adverse impacts caused by other stressors." *Id.* at 969.
- "The BiOp completely fails to analyze economic feasibility, consistency with the purpose of the action, and consistency with the action agency's authority demanded by § 402.02. Further analysis in compliance with § 402.02 is required on remand." *Id.* at 970.

Similarly, in the *Consolidated Salmonid Cases*, the district court found, among other flaws:

- "It was clear error and inconsistent with standard practice in the field of fisheries biology for Federal Defendants to rely upon the raw salvage analyses set forth in Figures 6-65 and 6-66 to reach conclusions about the effect of specific levels of negative OMR flows on the Listed Species. None of the alternative record citations or analyses cited by Defendants, including the PTM Modeling Results, or Figures 6-71, 6-72, or 6-73, provide sufficient alternative bases for NMFS's conclusions regarding the negative OMR flows below which loss of juvenile salmonids 'increases sharply.'" *Consolidated Salmonid Cases*, 791 F. Supp. 2d 802, 955 (E.D. Cal. 2011).
- "Federal Defendants' reliance on Figure 6-71 also suffers from the same unjustified use of raw salvage data. Federal Defendants must clarify on remand whether it is possible to scale the CV steelhead data used in Figures 6-72 and 6-73 to population size and, if not,

why unscaled analyses are nevertheless useful. Federal Defendants must also further explain and/or refine the statistical methodologies used to develop these figures." *Id.* at 955-956.

- "The record does not support the BiOp's conclusions about the connection between Project operations on the one hand and pollution and/or food limitations on the other. This is not the best available science." *Id.* at 956.
- "[T]he BiOp does not clearly explain the rationale for imposing a 4:1 ratio in above normal and wet years. Particularly in light of the potential adverse consequences of imposing such a ratio, this is unlawful." *Id.* at 957.
- "Likewise, although there is marginal record support for the imposition of some form of OMR flow restriction, Action IV.2.3 must be remanded for further explanation of the necessity for the specific flow prescriptions imposed, which are derived primarily from PTM simulations, a method that is undisputedly an imperfect, if not incompetent, predictor of salmon behavior." *Id.* at 957.
- "Action IV.3 suffers from a similar defect. Although there is record support for some form of action designed to prevent large numbers of fish from being killed or harmed at the export facilities, lawful explanation is required to justify the specific triggers imposed by Action IV.3." *Id.* at 957.
- "Federal Defendants failed to sufficiently explain whether the RPA can be implemented consistent with the co-equal, non-environmental statutory purposes of the action." *Id.* at 957.
- "[W]hile there is anecdotal evidence for some of the general approaches used in these RPA Actions, the specific prescriptions imposed are not sufficiently justified or explained. NMFS acted arbitrarily and capriciously in concluding that Actions IV.2.1, IV.2.3, and IV.3 are essential to avoid jeopardy and/or adverse modification." *Id.* at 957.

In light of these and other serious flaws in the last biological opinions, Reclamation, FWS, and NMFS must engage in a fundamental reanalysis of the effect of CVP and SWP operations on the listed species, and the necessity for and efficacy of any measures intended to address such effects. For their part, FWS and NMFS must do such reanalysis and issue new biological opinions. For its part, Reclamation must consider those new opinions, and make a determination of its ESA obligations. In performing these tasks, all the federal agencies should carefully consider the data and analysis of impacts and alternatives produced through the NEPA process.

Reclamation must prepare a new biological assessment for the new consultations. A new biological assessment is necessary both because of new scientific data and studies that have become available since 2008, and because of changes in current and planned project operations since 2008. Among other recent information, new science since 2008 includes life-cycle models, analyses of ammonium impacts on the food web, and analyses addressing the need for a "fall X2" measure. An example of changed project operations is implementation of the San Joaquin River Restoration Program, which requires the restoration of flows to the San Joaquin River Basin and the reintroduction of spring-run Chinook salmon into the San Joaquin River. Reclamation has already begun modifying the flows that reach the Delta, and reintroduction of spring-run Chinook salmon to the San Joaquin River is scheduled to begin by December 31, 2012.

The consultation must also consider other, ongoing regulatory and permitting processes that will influence project operations and the affected environment. The BDCP is expected to provide the basis for endangered species permits for, and a biological opinion regarding, in-Delta operations of the SWP and CVP beginning in about 2025. The draft BDCP is scheduled to be released in late 2012 and finalized in 2013. Elements of the BDCP not involving CVP and SWP operations will improve conditions for listed species even before new facilities become operative in 2025. Also, the State Water Resources Control Board ("State Water Board") is in the process of revising its existing Bay-Delta Plan. This revision may include updated or new objectives (e.g. San Joaquin River flow objectives) that could impact project operations. All that and more must be considered in a new biological assessment, and in the new biological opinions.

A final issue related to the new consultations is what period of project operations should be included in the consultation. The FWS and NMFS will issue new biological opinions for BDCP that will address in-Delta CVP and SWP beginning in 2025. Those biological opinions will then supersede the biological opinions that result from the reconsultation pursuant to the remand. Accordingly, the Public Water Agencies suggest that the reconsultation, and the related NEPA review, address project operations until in-Delta CVP and SWP operations are covered through the BDCP permits and BDCP-related biological opinions.

B. <u>The NEPA Rulings</u>

The district court did not direct what level of NEPA review Reclamation should undertake on remand. In the *Consolidated Delta Smelt Cases* the district court ruled that Reclamation's provisional acceptance and implementation of the 2008 Delta Smelt BiOp and its RPA constituted "major federal action" because those actions represented a significant change to the operational status quo of the coordinated operations of the CVP and SWP. (Memorandum Decision re Cross Motions for Summary Judgment on NEPA Issues (Nov. 13, 2009), Doc. 399 at 33, 42.) The court explained that the "critical inquiry" with respect to the "major federal action" issue is "whether the BiOp causes a change to the operational status quo of an existing project." (Doc. 399 at 33.) The court concluded that the "RPA will be implemented by altering flow patterns" and "implementing such management actions constitutes a new and unprecedented change in project operations, which will have restrictive impacts that have the potential to be major and adverse." (Doc. 399 at 36, fn. 13.) The court explained that "Reclamation's decision to implement the RPA is a 'revision [of] its procedures or standards' for operating the Jones pumping plant and other facilities significantly affecting OMR flows" and is therefore "major federal action because it substantially alters the status quo of the Projects' operations." (Doc. 399 at 41-42 [alteration in original].)

The district court explained that where the "major federal action" component for triggering NEPA is met, "an agency must prepare an EIS 'where there are substantial questions about whether a project may cause degradation of the human environment.'" (Doc. 399 at 42 [quoting *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1239 (9th Cir. 2005)].) The court found it undisputed that "implementation of the RPA reduced pumping by more than 300,000 AF in the 2008-09 water year" and that such reductions in exports from the Delta may place greater demands upon alternative sources of water, including groundwater. (Doc. 399 at

43.) The court also found the "potential environmental impact of groundwater overdraft is beyond reasonable dispute." (*Id.*) The court concluded that this, in and of itself, "raises the kind of 'serious questions' about whether a project may cause significant degradation of the human environment, requiring NEPA compliance." (Doc. 399 at 44.) The court therefore held that Reclamation must comply with NEPA and that "NEPA applies to Reclamation's acceptance and implementation of the BiOp and its RPA." (*Id.*)

The district court's summary judgment ruling on the NEPA issue in the *Consolidated Salmonid Cases* relied heavily on the analysis contained in the *Consolidated Delta Smelt Cases* NEPA ruling. *Consol. Salmonid Cases*, 688 F. Supp. 2d 1013 (E.D. Cal. 2010). The district court concluded that "Reclamation's operation of the projects to comply with the 2009 Salmonid BiOp RPAs is major federal action under NEPA." *Id.* at 1024. The court concluded that "implementation of the 2009 Salmonid BiOp is not a continuation of the status quo" and "implementation of the RPA constitutes a non-trivial 'revision of procedures or standards' for the operation of the Projects with draconian consequences." *Id.* at 1031, 1032. The court concluded that at the very least, the OMR Flow Restrictions in the RPA constituted "a significant revision to Reclamation's procedures and standards for operating the CVP." *Id.* at 1033. The court found that "it is hard to imagine more significant adverse effect to the human environment than were effectuated by implementation of the RPAs." *Id.* at 1032. The court found that it was undisputed that "the RPA will materially reduce water exports by 5-7 percent, or approximately 330,000 AF" and concluded that it was beyond dispute "that such reductions have the potential to significantly effect the human environment . . ." *Id.* at 1032. The court therefore concluded that there was no dispute that "'there are substantial questions' about whether coordinated operation of the CVP and SWP under the RPAs 'may cause significant degradation of the human environment'" and that "[n]o more is required to trigger NEPA." *Id.* at 1034.

The common thread in both decisions is that Reclamation must analyze under NEPA the potential impacts of any proposal or plan to modify the longstanding and ongoing coordinated operations of the CVP and SWP before making any such changes to CVP and SWP operations pursuant to an ESA section 7 consultation. Thus, the ultimate scope of Reclamation's task under NEPA depends upon the outcome of the ESA section 7 consultation among Reclamation, FWS and NMFS. If after consultation with FWS and NMFS Reclamation concludes that project operations will not jeopardize the listed species or adversely modify their critical habitat, then no major changes to the regime governing project operations should be required, and hence there would be no significant effects on the existing human environment triggering the need for an EIS. In that circumstance, an environmental assessment would likely suffice to meet NEPA's requirements. The NOI indicates that Reclamation has decided to prepare an EIS. That is a discretionary choice NEPA allows, even if upon further analysis the likely environmental impacts are revealed to be minor. Our point here is only that if there are no major changes to CVP and SWP operations, then an EIS likely would not be required.

On the other hand, if the new consultation results in a finding of jeopardizing effect or adverse modification of critical habitat, then Reclamation must consider what reasonable and prudent alternatives ("RPAs") to proposed operations are both necessary and efficacious. If Reclamation concludes that major changes to project operations will be required in order to avoid jeopardizing listed species or adversely modifying their critical habitat, then the scope of

Reclamation's task to meet NEPA's requirements will increase substantially.[3] The major changes to CVP and SWP operations required by the RPAs in the last biological opinions, for example, resulted in devastating adverse environmental and socioeconomic impacts within the project service areas, including particularly within the west side of the San Joaquin valley. Under the district court's ruling, Reclamation would then be duty bound to consider the impacts from changes in project operations on the quality of the human environment, as well as alternatives that may lessen those impacts while still meeting the requirements of the ESA. That will require an EIS.

Although the ultimate scope of the required NEPA review will vary depending upon what changes to project operations, if any, Reclamation decides are needed to meet its obligation under ESA section 7, the NEPA and ESA processes may and should proceed concurrently. *See* 40 C.F.R. § 1502.25(a); 50 C.F.R. § 402.06; NEPA Handbook at 3-21 – 3-23. Based on the NOI, it appears that Reclamation agrees that it may and should begin its NEPA process well before the section 7 consultation is completed. Information developed in the NEPA process should inform and improve the ESA consultations. Likewise, information developed during ESA consultation should be considered for the NEPA process.

C. Deadlines For Completing Remand

Reclamation must complete its ESA consultation and NEPA review by deadlines ordered by the district court. These deadlines differ between the two cases. The respective deadlines are:

	Consolidated Delta Smelt Cases	*Consolidated Salmonid Cases*
Draft BiOp	Oct. 1, 2011	Oct. 1, 2014
Draft EIS		April 1, 2015
Final EIS	Nov. 1, 2013 (Within 25-months of receiving draft BiOp / RPA)	Feb. 1, 2016
Final BiOp	Dec. 1, 2013	Feb. 1, 2016
Record of Decision		April 29, 2016

These dates were set by the court after consideration of representations by the federal agencies regarding how much time they needed to complete each consultation and related NEPA review.

It appears from the NOI that Reclamation may intend to analyze in a single EIS the effects of any changes to CVP and SWP operations for both the delta smelt and salmonid species. Under the remand schedules set by the court in the two cases, the entire remand process related to delta smelt must be completed by December 1, 2013, while even a draft salmonid biological opinion is not due to be completed until October 1, 2014. Hence, unless Reclamation and NMFS complete the remand required by the judgment in the *Consolidated Salmonid Cases*

[3] We do not address here the obligations of FWS and NMFS under NEPA, as the NOI relates solely to Reclamation's intention to prepare an EIS. The obligations of FWS and NMFS with respect to the existing biological opinions are the subject of ongoing litigation in the Ninth Circuit, and nothing in or absent from this letter should be construed as a waiver of any position regarding the NEPA obligations of those agencies.

much more quickly than the court's schedule would require, a change in schedule will be necessary to accommodate a combined analysis integrating all the listed species. Depending upon further clarification and discussions with Reclamation, FWS, and NMFS, the Public Water Agencies would consider supporting a change in the remand schedules if reasonably necessary for the purpose of allowing an integrated analysis covering all the listed species.

The existing separate remand schedules allow Reclamation, FWS, and NMFS more than adequate time to complete the full analyses required under NEPA and the ESA separately. The court's requirement that the agencies meet dates certain does not excuse an abbreviated, out-dated or incomplete analysis. However, if the federal agencies now believe that either existing schedule would preclude them from doing such full analysis, then the Public Water Agencies are open to discussions with them regarding potential adjustments. Again depending upon further discussions with the federal agencies, the Public Water Agencies would consider supporting an extension of time if and to the extent necessary to do the full analyses required by the ESA and NEPA.

IV. NEPA'S REQUIREMENTS

NEPA has a number of requirements that must be carefully followed in order to be legally compliant with the statute and implementing regulations. We address several of these obligations below, in response to the limited information provided in the NOI. As Reclamation decides upon and reveals more about its intended NEPA review, we will likely have additional comments to provide.

A. Purpose And Need

An EIS must contain a statement of "purpose and need" which briefly specifies "the underlying purpose and need to which the [lead] agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. The purpose and need statement "is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable." NEPA Handbook at 8-5. This purpose and need are important because they will inform the range of alternatives ultimately selected for analysis in the EIS and "[a]ll reasonable alternatives examined in detail must meet the defined purpose and need." *Id.*

The Department of the Interior's NEPA regulations provide that in "some instances it may be appropriate for the bureau to describe its 'purpose' and its 'need' as distinct aspects. The 'need' for the action may be described as the underlying problem or opportunity to which the agency is responding with the action. The 'purpose' may refer to the goal or objective that the bureau it trying to achieve, and should be stated to the extent possible, in terms of desired outcomes." 43 C.F.R. § 46.420(a)(1).

The NOI states that the "purpose" of the action "is to continue operations of the CVP, in coordination with the SWP, as described in the 2008 Biological Assessment (as modified) to meet its authorized purposes, in a manner that: [1] [i]s consistent with Federal Reclamation law, applicable statutes, previous agreements and permits, and contractual obligations; [2] [a]voids

jeopardizing the continued existence of federally listed species; and [3] [d]oes not result in destruction or adverse modification of designated critical habitat." 77 Fed. Reg. at 18859. Regarding "need," the NOI mentions only the CVP, stating that continued operation of the CVP is "needed" to "provide flood control, water supply, fish and wildlife restoration and enhancement, and power generation. It also provides navigation, recreation, and water quality benefits." *Id.* The NOI then goes on to observe, however, that coordinated project operations were "found to likely jeopardize the continued existence of listed species and adversely modify critical habitat. *Id.* This is an apparent reference to the conclusions of the two biological opinions the district court found to be fundamentally defective, and which will be superseded by new biological opinions after completion of reconsultation.

The Public Water Agencies believe that in this case, the *purpose* of the action and the *need* for the action are distinct—and, the EIS should reflect that difference. Here, the *purpose* of the action, the "goal or objective" expressed in terms of "desired outcomes," should be to continue long-term operation of both the CVP and SWP in a manner that will enable Reclamation and the DWR to satisfy their contractual and other obligations to the fullest extent possible. Importantly, those obligations include optimizing water deliveries to CVP and SWP contractors up to contract amounts, to help meet the needs of 25 million people and 2 million acres of agricultural land.[4] With population growth, the demands on CVP and SWP supplies will likely increase over time.

Compliance with the ESA should not be included in the purpose of the proposed action. Instead, in the context here, providing water supply as fully as possible while still complying with the ESA gives rise to the *need* for the action. The "underlying problem" that Reclamation is responding to is the difficulty both projects have had in serving water supply and other project purposes while complying with the ESA. In recent years, changes to project operations that purportedly were necessary to comply with the ESA have severely impaired the water supply function of the two projects, with disastrous consequences. Reclamation's present NEPA review should therefore be keenly focused on identifying actions it and DWR can take to better serve the water supply purposes of the projects while still meeting the requirements of the ESA. Reclamation's analysis must consider what effect the coordinated operations of the CVP and SWP actually have on species survival and recovery, what measures are proposed to reduce or compensate for such effects, what the data show about the likely efficacy of those measures, and what other effects those measures will cause including through reductions of water supply. That analysis should distinguish between actions that are necessary to comply with the mandates of the ESA, and other actions that may provide some additional protection or benefit for listed species, but are not necessary to comply with the ESA. The statement of purpose and need should make clear that an action alternative under which operations will comply with the ESA with minimal water supply impacts would be deemed superior to an action alternative under which operations will comply with the ESA but cause substantial water supply impacts. The Public Water Agencies' definition of the purpose and need does so, and will help Reclamation to appropriately focus the proposed action and range of alternatives to be considered in the EIS.

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[4] That obligation is typically found in Articles 11(a) and 12(a) of the CVP water service contracts. It is found in Articles 6(b), 6(c) and 16(b) of the standard SWP contract.

Two statements in the NOI's purpose and need section require additional comment. First, the text states that the purpose of the action is to continue project operations "as described in the 2008 Biological Assessment (as modified)." As stated elsewhere in this letter and in other correspondence with Reclamation, Reclamation must prepare a new biological assessment. We therefore disagree with the NOI to the extent that it implies that no new biological assessment is necessary. Furthermore, DWR and the Public Water Agencies should be permitted to directly and actively participate in the preparation of the biological assessment. Second, as stated elsewhere in this letter and other correspondence, the Public Water Agencies reject any suggestion that the conclusions of the existing biological opinions regarding effects on listed species are a legitimate starting point for the NEPA process or the new consultations. As demonstrated above, those biological opinions and their reasonable and prudent alternatives were remanded because they were not based on the best available science and were otherwise unsupportable and unjustified.

B. Affected Environment

To fulfill its NEPA duties, Reclamation must also provide a description of the affected environment. Reclamation is required to "succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration." 40 C.F.R. § 1502.15. This discussion should include "a general description of the physical environment of the project area and a map defining the project area, the associated ecosystem(s), and the affected environment." NEPA Handbook at 8-13. This general description "should include not only the physical setting for the project, but it should describe those features—geographic, cultural, recreational, or unique or significant wildlife or vegetation—that distinguish the affected area from other areas." *Id.* The condition of the affected environment includes the presence of a suite of stressors other than project operations that affect listed species. It also includes conditions within the service areas that are dependent upon water deliveries from the CVP and SWP.

The NOI does not use the term "affected environment." Under the heading "V. Project Area" the NOI states that "[t]he project area includes the CVP and SWP Service Areas and facilities, as described in this section." 77 Fed. Reg. at 18859. We agree that the directly affected environment includes all of the CVP and SWP service areas, as well as the areas where CVP and SWP facilities are located. The service area and project facilities include much of California. To describe the affected environment, the EIS must go further and include a general description of the physical environment within the service areas. 40 C.F.R. § 1502.15. The affected environment should include the area of and conditions within the Delta, and the Sacramento and San Joaquin river watersheds. The affected environment will encompass areas extending beyond the CVP and SWP service areas as well. For example, reductions in water supplies exported from the Delta may increase demands on Colorado River water as an alternative supply for Southern California. Identifying the direct and indirect effects of restrictions on CVP and SWP operations therefore requires consideration of conditions in a broad geographic region.

Accurately defining the extent and present condition of the affected environment is important to the analysis of environmental consequences. "The general description constitutes a basis from which specific environmental effects can be assessed." NEPA Handbook at 8-13. As

the NEPA Handbook further explains: "If available, the historic changes and trends affecting a resource or feature, up to and including present conditions, should be described to set the stage for the projection of future changes and trends concerning the resource or feature." *Id.* In particular, there are many historic and existing factors and conditions that affect the survival and recovery of listed species, factors that are unrelated to the operations of the projects (e.g., loss of habitat, upstream water use and diversions by other water users, alterations in land uses, municipal and industrial discharges, exotic species etc.). Those factors and conditions should be carefully described as part of the affected environment so that the effects of future project operations are considered in the appropriate context. While the historic changes in the Delta and throughout the area of analysis have occurred and may be identified to "set the stage," the impacts analysis must not attempt to attribute these past changes and existing impacts to any action alternative. Instead, an accurate and complete description of existing conditions is essential because the effects of the "no action" alternative are measured against the *existing* affected environment (e.g., not the environment that existed before the projects began operations).

C. No Action Alternative

An EIS[5] must "[i]nclude the alternative of no action." 40 C.F.R. § 1502.14(d). From the NOI, it does not appear that Reclamation has yet defined the no action alternative. "Because the no action alternative is the basis to which all other alternatives are compared, it should be presented first, so the reader can easily compare the other alternatives to it." NEPA Handbook at 8-8. According to Reclamation's NEPA Handbook, "'[n]o action' represents a projection of current conditions and reasonably foreseeable actions to the most reasonable future responses or conditions that could occur during the life of the project without any action alternatives being implemented." (*Id.*) Moreover,

> [t]he no action alternative should not automatically be considered the same as the existing condition of the affected environment because reasonably foreseeable future actions may occur whether or not any of the project action alternatives are chosen. When the no action alternative is different from the existing condition, as projected into the future, the differences should be clearly defined. Differences could result from other water development projects, land use changes, municipal development, or other actions. "No action" is, therefore, often described as "the future without the project."

NEPA Handbook at 8-8.

In an EIS, the action alternatives are compared to the no action alternative to measure the impacts of each action alternative. *See, e.g., Center for Biological Diversity v. U.S. Dept. of the Interior*, 623 F.3d 633, 642, (9th Cir. 2010) ("A no action alternative in an EIS allows

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[5] Discussion of the requirements of an EIS accepts Reclamation's apparent assumption that an EIS will be required, although that is not a foregone conclusion. As described above, the scope of the required NEPA review will depend upon what actions Reclamation decides are necessary to meet its obligations under the ESA.

policymakers and the public to compare the environmental consequences of the status quo to the consequences of the proposed action. The no action alternative is meant to 'provide a baseline against which the action alternative[ ]'...is evaluated. *Id.* A no action alternative must be considered in every EIS. *See* 40 C.F.R. § 1502.14(d).''). The district court ruled that Reclamation violated NEPA by significantly modifying project operations to meet ESA requirements without performing any NEPA analysis of the impacts of such modifications or alternatives to such modifications. Accordingly, in order to respond to this ruling on remand, here the "no action" alternative should be defined to include operations consistent with Reclamation's and DWR's obligations and all legal requirements *except* the requirements of the ESA. Under this definition of "no action," project operations would continue in compliance with other regulatory requirements (e.g., D-1641 as modified by applicable laws, including Wilkins Slough requirements, FERC license requirements, American River in-river flow requirements, etc.). Comparing this no action alternative to the action alternatives developed during the NEPA and ESA consultation process will provide the most comprehensive and appropriate disclosure of the environmental impacts of the various action alternatives to comply with ESA requirements.[6]

When Reclamation defines the no action alternative, it should not include implementation of the RPAs in the 2008 FWS and 2009 NMFS BiOps in the no action alternative. That would contradict the district court's ruling, because the NEPA analysis then would not measure and disclose the impacts of changes to CVP and SWP operations to comply with the ESA. It would defeat the purpose of the no action alternative—to provide a meaningful comparative scenario with which to gauge the impacts of the action alternatives. As the Ninth Circuit observed in a similar context, "[a] no action alternative in an EIS is meaningless if it assumes the existence of the very plan being proposed." *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008).

Appropriately defining the consequences of "no action" will require analysis not done in the previous ESA consultation. The record shows that the conclusions in the existing biological opinions that absent major changes project operations would jeopardize listed species and adversely modify critical habitat were not grounded on rigorous scientific analysis. For example, neither biological opinion employed the standard tool of life cycle modeling to test the significance of the effects of project operations, and other stressors, on the abundance of the listed species. While there is no question that project operations have some effect on individual members of the species through take at the export pumps, the significance of that effect on the overall population was not critically examined. It was instead largely presumed in the existing biological opinions. Further, as the district court found, the biological opinions attributed other adverse effects in the existing environment such as contaminants to project operations based only on speculation and surmise. The absence of sound scientific analysis to support the jeopardizing

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[6] The situation here is unlike most other circumstances where NEPA review is performed, because the CVP and SWP were constructed and operating before NEPA and the ESA were even enacted. Thus, the "no action" alternative, which usually serves as the baseline for evaluating the significance of environmental impacts of action alternatives, is more complicated. The existing projects including operations must be captured in the "no action" baseline so they are not included in the new effects of the action alternatives. For this reason, a hypothetical "no action" alternative that fails to account for current and previous operations of the projects would be an improper baseline for comparative analysis. *See American Rivers v. Federal Energy Regulatory Comm.*, 187 F.3d 1007 (9th Cir. 1999).

conclusions in the existing biological opinions completely undermines the validity of the specific prescriptions they imposed on project operations to remove that supposed jeopardizing effect. Furthermore, as described above, project operations have changed since 2008, and there are other regulatory processes that are underway that may further alter project operations in the coming years, regardless of whether any action is taken to modify project operations pursuant to section 7 of the ESA.

In the EIS, Reclamation must compare the environmental consequences of the no action alternative to the environmental consequences of the action alternatives. With respect to consequences for listed species, that comparison should measure and disclose how many more fish are expected to survive and reproduce under one scenario as opposed to another. For example, if reverse flows in Old and Middle rivers are limited by other existing non-ESA regulations but not by additional measures under the ESA, what are the expected effects on population abundance? If additional restrictions on such flows are imposed under the ESA, what is the expected affect on abundance of listed species? Do other measures that do not involve restrictions on project operations, such as habitat restoration, offer greater promise of improving abundance? The results of these analyses may then be considered together with the other environmental consequences associated with various alternatives, including consequences related to differences in water supply. Such a comparison is essential to inform policymakers and the public regarding the choices to be made.

It may be that despite more rigorous analysis than has been done before there will still be substantial scientific uncertainty regarding the likely environmental consequences of various alternatives. If so, that uncertainty should be expressly acknowledged. 40 C.F.R. § 1502.22. That, too, is important information for policymakers and the public. The existing biological opinions included specific prescriptions that were initially presented as if they were required by available science, but on closer examination were found to be based only on personal judgments. The -5,000 cfs limitation on Old and Middle river flows in the 2009 Salmonid BiOp is one example. The NEPA process here should make clear the differences between what is known based on the best available science, and where the appropriate decision makers must make policy judgments in the face of uncertainty.

D. Proposed Action

Under the CEQ regulations, a notice of intent is supposed to briefly describe "the proposed action and possible alternatives." 40 C.F.R. § 1508.22. As discussed above, the NOI does not clearly identify a proposed action, nor any possible alternatives. Indeed, from the NOI it appears Reclamation has not yet decided upon a proposed action, or identified possible alternatives to the proposed action. This apparently reflects the still preliminary and incomplete ESA consultation. The NOI states only that "[t]he proposed action for the purposes of NEPA will consider operational components of the 2008 USFWS and the 2009 NMFS Reasonable and Prudent Alternatives." 77 Fed. Reg. at 18860.[7] But the NOI does not specifically identify which

[7] An alternative, possible interpretation of this statement in the NOI is that Reclamation, FWS and NMFS have already decided they will again implement the reasonable and prudent alternatives in the existing biological opinions, and intend to do only perfunctory NEPA analysis and ESA section 7 consultation. That approach would violate NEPA and the ESA, and raise serious issues regarding compliance with the district court's orders. The

of the "operational components" from those biological opinions Reclamation has in mind, except that it will "analyze" "flow management actions" "resulting from" those biological opinions. The NOI does not identify possible alternatives to those components at all. The lack of specific information in the NOI regarding the proposed action and possible alternatives limits the ability of the Public Water Agencies to provide responsive comments here. When and if Reclamation provides specific information on those topics, the Public Water Agencies request that Reclamation provide them an opportunity to provide additional comment.

The NEPA Handbook provides that "[t]he proposed action should be defined in terms of the Federal decision to be made. When the proposed action is related to other actions—especially other Federal actions—a careful consideration of the independent value of the proposed action should be made. When the independence of the proposed action is not clear, it may be appropriate to expand the scope to include those other actions." NEPA Handbook at 8-6. Reclamation's decision regarding what it must do to comply with the ESA is closely related to the actions of FWS and NMFS in issuing new biological opinions regarding the effects of project operations on listed species. As a number of the Public Water Agencies have contended in the litigation, FWS and NMFS have a role and NEPA obligations here as well. Reclamation should at least consider defining the relevant Federal action subject to NEPA review to include the actions of FWS and NMFS in issuing the new biological opinions, as well as any role they reserve for themselves in implementing any measures imposed in the new biological opinions.

Components of the flawed existing biological opinions should not be included as part of the proposed action. First, Reclamation does not yet know the outcome of reconsultation, and should not presume at this point that *any* reasonable and prudent alternatives are needed to avoid jeopardizing the continued existence of listed species or the adverse modification of designated critical habitat. Furthermore, many of the specific components of the 2008 FWS and 2009 NMFS RPAs were found unlawful, and hence are poor candidates for inclusion in a proposed action. *See* Section III.D, below (discussing rejected RPA components). It may be appropriate to include some elements of the RPAs in the existing BiOps in potential alternatives for discussion and analysis, but the arbitrary and illegal nature of those measures would provide a sound basis for rejecting them. The NOI states that the "proposed action will not consider" alternatives "that would require future studies." However, NEPA requires new studies where the available information is incomplete, unless the agency can make specific findings of exorbitant cost and infeasibility. 40 C.F.R. § 1502.22.

The Public Water Agencies submit that a scientifically rigorous analysis of the effects of CVP and SWP operations would likely conclude that those operations do not jeopardize the listed species or adversely modify their critical habitat. Accordingly, the Public Water Agencies suggest that for NEPA review Reclamation define the proposed action as the continued operation of the projects, including existing, valid regulatory requirements, subject to lawful requirements of the incidental take statements in new biological opinions, without major changes to project operations imposed under the ESA. That proposed action, measured in comparison to the no action alternative, should have only modest environmental impacts. That proposed action would also meet the purpose and need described above. Ultimately, of course, Reclamation's decision

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comments in this letter presume that the federal agencies intend to follow the law and the court's orders, and these comments are intended to assist them in doing so.

regarding the action necessary to meet its ESA obligations must be informed by the outcome of the pending reconsultations.

E. Action Alternatives

The Public Water Agencies are also concerned about the type and range of alternatives that will be analyzed in the EIS(s). The alternatives analysis is the "linchpin" of an EIS. *Monroe County Conservation Council, Inc. v. Volpe*, 472 F.2d 693, 697 (2d Cir. 1972). In the alternatives analysis, federal agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. §§ 4332(2)(E); 4332(2)(C)(iii). Agencies must "rigorously explore and objectively evaluate all reasonable alternatives" and explain why any alternatives were eliminated from detailed consideration. 40 C.F.R. § 1502.14. Reasonable alternatives are those that are "technically and economically practical or feasible and meet the purpose and need of the proposed action." 43 C.F.R. § 46.420.

According to its own policies, Reclamation must develop and assess appropriate and reasonable alternatives for actions that may significantly affect the environment, integrate the Endangered Species Act into its analyses, and use the best available environmental data, including acquiring additional appropriate and reasonable data to support its decisionmaking. Reclamation Manual Policy No. ENV P03 (1998) *available at* http://www.usbr.gov/recman/env/env-p03.pdf, last visited April 9, 2012. Determining which alternatives are to be considered and analyzed is vitally important in shaping the EIS, and the scope of alternatives is directly related to the underlying purpose and need for which the action is being proposed. 40 C.F.R. § 1502.13. It is the purpose and need for the proposed action that dictates what alternatives should be developed for analysis. *See League of Wilderness Defenders-Blue Mountain Diversity Project v. Bosworth*, 383 F. Supp. 2d 1285 (D. Or. 2005). The Department of Interior's Regulations for Implementation of NEPA explain that "[t]he range of alternatives includes those reasonable alternatives that meet the purpose and need of the proposed action, and address one or more significant issues related to the proposed action." 43 C.F.R. § 46.415.

Here, as discussed above, the purpose is to continue long-term operation of both the CVP and SWP in a manner that will serve the authorized purposes of the projects as fully as possible. Those purposes include supplying water to help meet the needs of 25 million people and 2 million acres of agricultural land. The need for the action arises from the difficulty both projects have had in serving the water supply and other purposes while complying with the ESA. The NOI appears focused on flow-related changes to project operations as the proposed action to be considered in the NEPA process. The Public Water Agencies urge Reclamation to consider measures that may benefit the survival and recovery of listed species that do not involve modifications to project operations. These alternative actions must be explored to ascertain whether any would serve the purpose and need by maintaining or benefitting populations of listed species while at the same time allowing adequate and reliable water supplies to be delivered by the CVP and SWP.

There have been numerous scientific developments since the BiOps and their RPAs were issued and overturned by court order. This new scientific understanding of the various stressors

and means to alleviate their impacts on listed species must be evaluated as part of the best available environmental data for developing alternatives. Attached hereto as Exhibit B is a list of some of the recent scientific articles issued since the 2009 BiOp was released. These new data relate to NEPA's obligation to examine and fully analyze potential alternative actions, as well as to the ESA's requirement that the best available science be used.

Reclamation is required to rigorously explore a variety of alternatives. As stated, the alternatives should allow for adequate water deliveries and prevent significant impacts to public health and the human environment, and also explore various methods to sufficiently maintain and protect the listed species and their critical habitats. Thus, alternatives that simply focus on flow regimes or decreasing water exports would be inappropriately narrow. As the district court previously recognized, the RPAs in the remanded BiOps had serious failings, including whether their implementation led to a wasting of water supplies without providing measurable benefit to the species.

If the RPAs in the BiOps are going to be considered as alternatives in the process—an action the Public Water Agencies believe is flawed given the court's prior rejection of the RPAs—the environmental impacts associated with implementing those measures must be fully analyzed. The Public Water Agencies believe the better approach is for the new NEPA process to affirmatively recognize that many portions of the RPAs adopted in the prior BiOps were found to be fatally flawed and to not attempt to ignore the findings of the court by including the RPAs in the environmental analysis regardless of the court's determination. For example, in its decision to remand the FWS BiOp, the district court rejected, among other components of the delta smelt BiOp RPA, its regulation of Old and Middle River ("OMR") flows and setting a range of new OMR flow prescriptions in the RPA based on raw salvage values. Similarly, the court rejected the RPA's regulation of the location of fall X2 in above-average and wet water years due, among other reasons, to the misuse of DAYFLOW data with Calsim modeling output when setting the X2 location prescriptions. The court also rejected the BiOp's conclusions regarding indirect effects. MSJ Decision, *Delta Smelt Consolidated Cases* at pp. 219-25 (Dec. 14, 2010). Further, the court criticized the BiOp's failure to "justify or explain its attribution to Project operations adverse impacts caused by other stressors . . . [requiring] further consideration and explanation." *Id.* at p. 223.

NMFS's imposition of an RPA in the Salmonid BiOp was also fatally flawed, according to the district court. For example, the court rejected the RPA's flawed use of raw salvage for regulating OMR flows; criticized NMFS's "chronic and unsatisfactorily explained failure" to use lifecycle modeling approaches and its "inexplicable" management approach without considering aspects of its lifecycle that are impacted by ocean conditions and ocean harvest; rejected the RPA's imposition of a 4:1 San Joaquin River inflow-export ratio in RPA Action IV.2.1, the specific OMR flow prescriptions in Action IV.2.3, and the triggers imposed by Action IV.3. MSJ Decision, *Consolidated Salmonid Cases* at pp. 270-75 (Sept. 20, 2011). The court specifically noted that questionable and equivocal evidence supporting agency decisions to impose significant adverse consequences on the state's water supply should "not drive the formulation of an RPA." *Id.* at pp. 272-73.

It follows from the above discussion that serious consideration should be given to discarding the old RPA actions altogether and replacing them with alternative actions that will both benefit listed species and reduce impacts to water exports. When selecting a range of alternatives for the new EIS, Reclamation should strongly consider alternatives that will reduce impacts to water exports, rely upon the best available science, and provide measurable and tangible benefits to the listed species.

Reclamation is required to consider "potentially reasonable alternatives beyond its own jurisdiction" and to consider "the jurisdictions of other agencies (Federal and otherwise) when determining what reasonable alternatives should be considered." NEPA Handbook at 8-9; 40 C.F.R. § 1502.14(c). Such alternatives may include actions within the jurisdiction of agencies such as the State Water Board and the Regional Water Quality Control Boards, to address water quality habitat stressors created by the discharge of pollutants and contaminants. Alternatives may also include actions within the jurisdiction of the California Department of Fish and Game and the Fish and Game Commission, to address predator stressors created by implementation and enforcement of the bass fishing regulations.

As described in detail below, many other factors should also be considered in formulating alternative actions to be evaluated as part of the NEPA process. At a minimum, the following factors should be evaluated. These factors could potentially constitute elements of alternative actions themselves, or they could be evaluated as mitigation measures that apply no matter what alternative is ultimately selected.

1. Alternatives For The Protection Of All Listed Fish Species In The Delta

General measures should be included as alternatives to decrease the need to rely on curtailing exports by the projects. For example, Reclamation should consider methods for reducing the populations or impacts of alien species/predator species, such as striped bass. (PPIC 2011, *Managing California's Water: From Conflict to Reconciliation*, p. 212.) Alternatives that regulate smaller water diversions, especially unscreened diversions, should also be considered. It would also be appropriate to evaluate alternatives that require and implement an alternative conveyance, and/or reduce toxic chemicals. (PPIC 2011, pp. 222-224.) The 2012 Natural Research Council Report, *Sustainable Water and Environmental Management in the California Bay-Delta*, for example, described potential measures for managing risks to Bay-Delta ecosystems from selenium, methyl-mercury, pesticides/herbicides, emerging chemicals, metals, and legacy organic contaminants and PAHs. (NRC 2012, p. 75.)

2. Alternatives That Address Specific Concerns Related To The Delta Smelt

a. X2 Location Management Should Not Be Considered Because It Is Not A "Reasonable Alternative"

As a starting point for the alternatives analysis, the NOI implies that Reclamation will analyze flow management aspects of the 2008 FWS and 2009 NMFS BiOps and RPAs. FWS's effects analysis in the First Draft 2011 Formal ESA Consultation on the Proposed Coordinated Operations of the CVP and SWP, at pp. 285-290 (Dec. 2011), refers extensively to salinity and the low salinity zone ("LSZ") as a primary constituent element ("PCE") of delta smelt habitat.

However, the best available science shows—and the district court found—that such an approach dramatically overemphasizes the influence of the fall location of X2 on delta smelt survival, reproduction and abundance. *Id.* at pp. 279-83. As Reclamation is well aware, FWS's 2008 BiOp contained a fall action that involved regulating the location of X2 for purported benefits to the delta smelt that was overturned by the Court based upon a lack of supporting evidence. Continued efforts to defend the imposition of Fall X2 in the face of substantial testimony—some of it from the FWS and Reclamation witnesses themselves—indicating that the location of Fall X2 bears little relationship to the abundance of Delta smelt ultimately caused the Court to characterize the FWS's witnesses as "zealots."

As further discussed in the document attached hereto as Exhibit C, the LSZ only weakly overlaps the delta smelt's habitat, which is comprised of a multitude of biotic and abiotic characteristics. In light of the analysis in Exhibit C as well as the thorough rejection of the Fall X2 Action by the Court, Reclamation should not commit to an inappropriate overemphasis of the LSZ's influence. Doing so would wrongly attribute impacts to the projects that only have a nominal effect on the species and lead to the selection of alternative measures for NEPA evaluation that waste water resources and have little or no benefit to the species. Moreover, as recognized by the court, the selection of measures that would impose substantial impacts on human health and the environment would be inconsistent with the water supply purpose of the projects.

b. Food Availability For Delta Smelt

Three recent life-cycle modeling studies (Maunder & Deriso 2011, MacNally et al. 2010, and Miller et al. 2012) found that food availability was a significant driver of delta smelt abundance. Consistent with these modeling efforts, the available scientific data from CDFG surveys show evidence that zooplankton food supplies for delta smelt are an important factor affecting the species' population dynamics. By contrast, these studies also show that the location of fall X2 and associated estimates of "abiotic habitat area" are not strong predictors of delta smelt population dynamics.

Food availability could be improved through alternatives that require: wetlands restoration, particularly salt marsh work, controlling ammonia discharges (Dugdale et al 2007) and nutrient inputs (i.e., total N inputs related to ammonium loading) rather than using flows to dilute the pollution; controlling the *Corbula amurensis* clam (NRC 2012, p. 70); controlling aquatic macrophytes; and/or controlling blooms of toxic cyanobacterium *Microcystis aeruginosa* (NRC 2012, p. 67.)

With respect to the *Corbula* clam, the infiltration of the clam into the Suisun Bay region since 1987 has caused major changes in the availability and composition of food sources in the LSZ. It has made Suisun Bay habitat less desirable, while the Cache Slough region—approximately 40 km away to the north and far removed from the LSZ's influence—has maintained important characteristics, such as higher turbidity and food availability, that facilitate spawning and rearing of delta smelt. Recent survey efforts have shown substantial year-round populations of delta smelt in the north Delta.

c. A Combination Of Turbidity Conditions And Spring Flow Should Be Evaluated, Rather Than Just Focusing On OMR Flow Alone

The best available scientific data also confirm that imposing OMR flow controls alone, without simultaneous consideration of other factors affecting species geographic location and abundance, is insufficient. For the protection of delta smelt, in particular, the correlation of normalized salvage as a function of both turbidity and OMR flow shows that during conditions of low turbidity (i.e., clear water), salvage rates are low even when OMR is highly negative. This may occur because delta smelt avoid open waters and mid-channel areas where they are subject to higher predation and other stressors.

Figure 1, below, shows a bubble plot of normalized salvage as a function of both turbidity and OMR flow performed by Dr. Rick Deriso (2012), where the size of the bubbles is proportional to the amount of observed daily normalized salvage—the bigger the bubble, the larger the percentage of the population salvaged. As seen in the figure, most of the larger normalized salvage events (i.e., larger bubbles) lie in the region that the data suggests would be avoided by using less restrictive OMR limits than are in the remanded delta smelt biological opinion (i.e., the events in the region below and to the right of the OMR trigger would be avoided). Periods when no salvage occurred (i.e., the red dots) generally tend to occur in much greater frequency above and to the left of the trigger line. Thus, the bubble plot shows that salvage is generally more rare above the trigger line, but occurs more frequently and with generally larger salvage events below the trigger line.

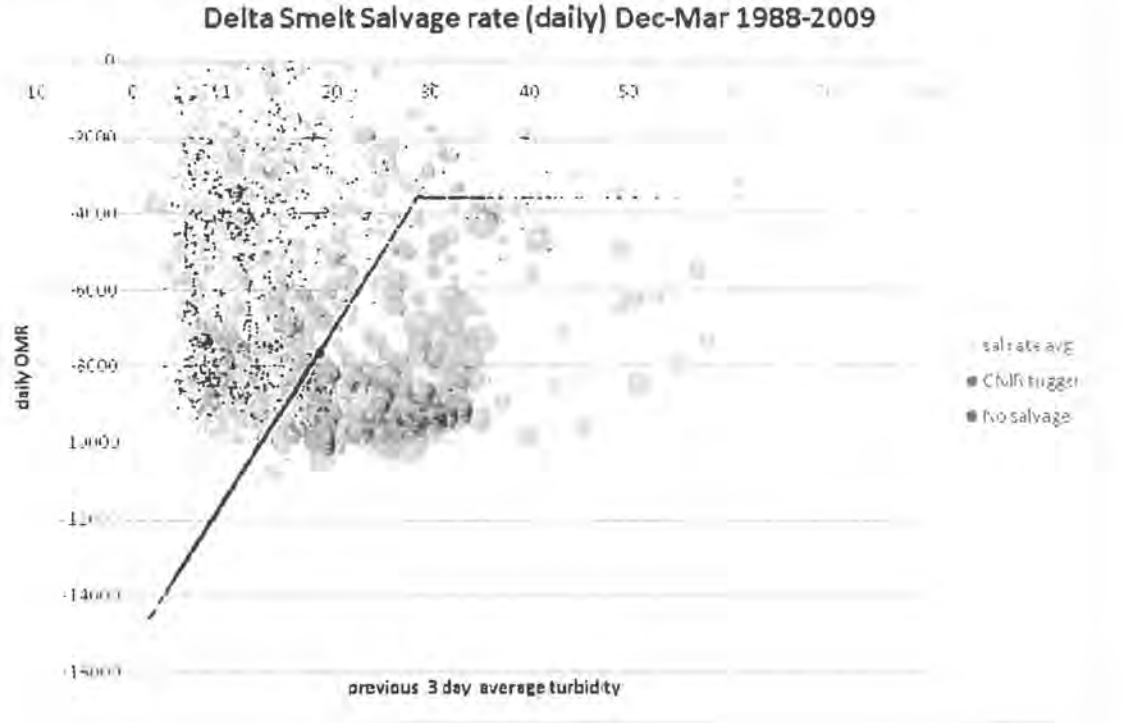

Figure 1. OMR trigger (Y axis) as a function of prior three-day average turbidity (X-axis), along with observed daily normalized salvage (bubble size). Data is shown only if there are three previous days with turbidity estimates and it is restricted to days with negative daily OMR flow (for a total of 1880 days).

Importantly, OMR flow controls imposed in a vacuum do not provide any particular benefit to the species. The best available scientific data show that OMR flows have application in reducing entrainment, when used in combination with turbidity triggers and normalized salvage. Based upon this information, consideration should be given in the NEPA process to evaluating the environmental effects of an alternative action to protect delta smelt based upon coupling normalized salvage, turbidity and flow regimes. Using this information, alternatives can be developed to provide for the lowest salvage at the lowest possible water cost. Another important question is whether entrainment has population level effects, and if so under what circumstances. Any restrictions on OMR to limit entrainment should be limited to circumstances where doing so is necessary to avoid meaningful population level effects.

3. Alternatives That Address Specific Concerns Related To Salmonids

a. Temperature Control

Adequate temperatures need to be maintained for successful spawning, egg incubation, and fry development (between 42.5 and 57.5°F). (Salmonid MSJ Decision p.7, Doc. 633 (Sept. 20, 2011) (*Consol. Salmonid Cases*, 791 F. Supp. 2d 802 (E.D. Cal. 2011)); Salmonid BiOp p. 90, 93.) Temperature is one of the dominant factors affecting Salmonid populations. (Salmonid MSJ Decision p.58., Doc. 633 (2010).)

b. Recreational And Commercial Fishing

The potential effects on listed species of recreational and commercial fishing should also be very carefully evaluated. Ocean harvest is one of the dominant factors affecting Salmonid populations. (Salmonid MSJ Decision p.58, Doc. 633 (2010).) As noted by Judge Wanger, "It is inexplicable that these species are being managed in a piecemeal fashion, without considering all aspects of their life cycle in the same analysis, which would facilitate description of the true effect Project operations have on the species in light of other conditions. What population is available to be affected by Project operations is entirely relevant, as all Defendants have sought to attribute the species' decline to Project operations." (Salmonid MSJ Decision p.86, Doc. 633 (2010).)

c. Ocean Conditions

Ocean conditions directly tie into ocean survival of salmonids. The NRC has explained that "patterns in atmospheric temperature, wind, and precipitation drive ocean temperatures, mixing and currents, which in turn control growth and advection of plankton that provide food for salmon." (NRC 2012, p. 95 (citing Batchelder and Kashiwai, 2007).) Thus, an alternative that increases the diversity of wild and hatchery salmon ocean entrance timing would help ameliorate unfavorable ocean conditions. (NRC 2012, p. 107.)

d. Competition From And Control Of Hatchery Fish

Additionally, an alternative should be included that addresses competition from and control of hatchery fish, because NMFS itself identifies hatchery effects as a major stressor contributing to the decline of Central Valley steelhead. (NRC 2012, p. 92; *see also* NRC 2012, p. 95; PPIC 2011, p. 221.)

4. Green Sturgeon

Reclamation should also consider alternatives that address the green sturgeon population. Due to known temporal and spatial differences with salmonids, green sturgeon should be evaluated separately. To better understand these differences, more studies may be needed.

Based on these factors, the Public Water Agencies suggest that Reclamation explore a broad suite of alternatives actions that will satisfy the agency's ESA obligations while also avoiding unnecessary limitations on the essential water supply operations of the SWP and CVP.

F. Mitigation Measures

In addition to analyzing the impacts of all potential, feasible alternatives, the EIS must include a discussion of the "means to mitigate adverse environmental impacts." 40 C.F.R. § 1502.16(h). Accordingly, the EIS must identify all relevant, reasonable mitigation measures that could alleviate a project's environmental effects, even if they entail actions that are outside the lead or cooperating agencies' jurisdiction. *See* "Forty Most Asked Questions Concerning CEQ's NEPA Regulations," No. 19b. Such measures must entail feasible, specific actions that could avoid impacts by eliminating certain actions; minimizing impacts by limiting their degree; rectifying impacts by repairing, rehabilitating or restoring the affected environment; reducing impacts through preservation or maintenance; and/or compensating for a project's impacts by replacing or providing substitute resources. 40 C.F.R. § 1508.20. Any environmental effects that may occur as a result of implementation of these mitigation measures must also be disclosed and analyzed.

As with the identification and analysis of alternatives and project components, the development of mitigation measures has the potential to greatly reduce environmental impacts, including those to the listed species and other biota, which could result from some component of the various alternatives. Determining the precise impacts that project operations and the projects' components currently have on the listed species is vitally important; otherwise, mitigation measures (or alternative actions) may be imposed that will have additional environmental impacts but will not actually avoid, minimize, rectify, reduce, or compensate for the project's impacts. In addition, the effectiveness of any mitigation measures in reducing such impacts must be determined, as well as how much those impacts will be reduced by any particular mitigation measure. *See South Fork Band Council of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 588 F.3d 718, 727 (9th Cir. 2009). Some of the actions discussed above in the section on alternatives could potentially also function as mitigation measures. Other types of mitigation measures, including restoration of habitat, could also be explored.

V. EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS OF ALTERNATIVES

As discussed above, the potential environmental impacts associated with implementing each alternative must be evaluated in the EIS. Impacts occurring not only in the Delta and surrounding areas, but also in the service areas of water agencies that deliver Delta water to tens of millions of Californians and hundreds of thousands of acres of farmland must also be analyzed. As cooperating agencies representing member agencies that have first-hand knowledge of the impacts of reduced Delta water deliveries, the Public Water Agencies can provide some of the specific information that will be needed for this analysis. We include the following information as an overview of the types of impacts to be evaluated, and other critical considerations and information that must be included. Additional, more detailed descriptions of specific environmental impacts that should be evaluated, as well as supporting references, are provided in Exhibit D.

A. Impacts To Specific Resource Categories

1. Water Resources, Including Groundwater

Given the value of and constraints on reliable water supplies in California, virtually any reduced deliveries of Delta water supplies to SWC and SLDMWA member agency service areas will have demonstrable, dramatic, and undeniable environmental impacts. Lower export water deliveries translate directly into water losses for urban and agricultural users. Such reduced deliveries compel greater reliance by retail agencies and their customers on groundwater to meet demand not only in dry years, but in other year types when greater exported water deliveries are currently anticipated. In turn, reduced exports and deliveries during more year types and in greater quantities diminish the ability of water managers to replenish and store groundwater when water is available to do so.

These circumstances can, and likely will, lead to additional groundwater overdraft (pumping beyond an aquifer's safe yield) throughout the Public Water Agencies' service areas, particularly in agricultural areas. Reduced groundwater levels can also lead to land subsidence that can additionally damage water conveyance facilities and other infrastructure, as has been documented throughout the state. For example, at the recent May 22, 2012 Scoping Meeting held in Los Banos, a speaker from the Central California Irrigation District stated that the District has spent $4.5 million to rehabilitate its conveyance facility, due to land subsidence resulting from groundwater overdraft and is involved in another $2.5 million program with Fresno County to study and replace a bridge damaged by land subsidence.

Reduced ability to replenish ground and surface water reserves also adversely impacts the ability of water purveyors to store water for dry years and emergencies. As just one example, reduced water storage can be expected to render southern and central California increasingly vulnerable to having insufficient supplies to suppress wildfires or sufficient supplies to survive a severe earthquake affecting conveyance facilities or other catastrophic events. Reduced exports of Delta waters also results in increased reliance by retail water users and their customers on other limited and lower quality supplies, such as recycled water, that need to be blended with SWP water to make them available for beneficial use. Finally, any impacts to the ability of the

CVP and SWP to facilitate water transfers, including transfers of non-project water, should be addressed. For example, Reclamation must evaluate and disclose whether an alternative imposes additional operational constraints that limit (from "no action" conditions) the time or frequency when such transfers could be accomplished. These are just a few of the dozens of potential impacts to water resources that will result from reduced export and delivery of Delta water supplies to the SWP and CVP service areas.

2. Land Use, Including Agriculture

Reduced SWP and CVP deliveries will result in significant changes in land use, particularly in agricultural landscapes. As dramatically shown during the 2007-2010 period, reduced export water deliveries can and will increase fallowing of land across the Central Valley and elsewhere. Reduced water supplies can also cause shifts toward planting permanent crops that have diminished ongoing water requirements, but which also require watering year-in and year-out, thus diminishing future flexibility in water budgeting by precluding management options such as annual cro -shifting or fallowing. Reduced supplies and lower quality water can also impact the production of certain crops, as well as the yield of crops that are grown. The unavailability of project water also increases the costs to obtain supplemental water. Lost exports also negatively impact water management plans that are produced by water agencies as source documents for evaluating land use projects. As imported water supplies become less reliable, establishing firm water supplies sufficient to meet land use planning requirements becomes more difficult.

3. Socioeconomics

Reduced Delta water supplies also cause socioeconomic impacts. In response to reduced water supplies, farmers fallow fields and this reduced agricultural productivity results in layoffs, reduced hours for agricultural employees, and increased unemployment in agricultural communities. Reduced agricultural productivity also has socioeconomic impacts for agriculture-dependent businesses and industries. In addition, unavailability of stable and sufficient water supplies reduces farmers' ability to obtain financing, which results in employment losses, due to the reduced acreage of crops that can be planted and the corresponding reduction in the amount of farm labor needed for that reduced acreage. Reduced water supplies and the resulting employment losses also cause cascading socioeconomic impacts in affected communities, including increased poverty, hunger, and crime, along with dislocation of families and reduced revenues for local governments and schools. In the urban sector, reduced supplies or increased supply uncertainty can cause water rates to increase as agencies seek to remedy supply shortfalls by implementing measures to reduce demand or augment supplies. Connection fees and other one-time costs for new developments may also increase and further retard economic development.

Some of personal and regional socioeconomic impacts of reduced water supplies, particularly to agriculture-dependent communities located on the westside of the San Joaquin Valley, were described by speakers at the May 22, 2012 Scoping Meeting held in Los Banos. At that meeting Congressman Costa described some of the socioeconomic impacts of the reduced water supplies resulting from the BiOps, stating:

> the low average rainfall and court ordered restrictions and, in my opinion, severely misguided regulations that we saw formed in 2008 and 2009, created some of the most severe water shortages in farming communities in my district and throughout the valley in the last 3 years. Starting with a zero water allocation, zero percent in 2009, some of the hardest working people you'll ever meet, many of you in this room, stood in food lines, unable to have work because there was no water and it should have never happened. Thousands of jobs were lost and unemployment reached in communities like Mendota and Firebaugh, over 40%.

Another speaker at the meeting, Fresno County Board of Supervisor Judy Case, described the socioeconomic impacts of the reduced water supplies, stating:

> We're here to talk about what happens when there's no water on the west side. Workers lost their jobs. They not only lost their jobs, they lost jobs that had become permanent with benefits so they had healthcare for their families. Unemployment in Fresno County was higher than the entire United States. We kept unemployment up at 43 percent. And people who have worked really hard to purchase their first home they lost it in foreclosure and they were put in food lines in which food was provided.
>
> As a County, we provide safety nets to help people in a position who can't help themselves and our request for services soared. Some families were forced to leave the area to look for jobs and for work and they left with their children which affected the local schools which lost students and the revenue that came to support those students. For families to survive, they left the house they had just bought and been so hopeful for and they moved in with relatives with two and three and four families living in the same house or apartment.

The statements made by one farmer at the scoping meeting exemplify the real-world impact of reducing water supply deliveries:

> 2009 is a year that is engraved in my mind and it is there because it should never happen again. The impacts were severe on our farm. On my farm alone, I have over 900 acres of land. On those 900 acres were losses that were huge. In farmgate prices, in millions of dollars of losses, in wages, in hundreds of thousands of dollars of food for millions of people around the country. The effects were terrible on our farm, but the effects were more terrible on our farm workers. We saw people without jobs. We saw people who were working then they were unemployed. People that instead of working 60 hours per week were working 40 and 45 hours per

> week. We tried not to lay people off so we just reduced their hours because our farm was cut down from 2,200 to approximately 1,300 acres.
>
> There were other impacts in my area. We saw many people who lost jobs move away. These are people that are skilled at what they do. Driving tractors, irrigating and harvesting. Many of these people didn't come back. We saw in my area the little brown school out in the country that I went to since I was in first grade closed down for lack of enrollment. So, it hurts us a lot to think about that and we should never forget that.

These statements reflect some of the significant socioeconomic impacts of reducing water supplies to the farms, families and businesses that depend of CVP and SWP water. These impacts are very real and must be honestly explored and evaluated in the NEPA process for any alternatives that would reduce CVP and SWP water supply deliveries.

4. Environmental Justice

Although the impacts from reduced water supplies will have significant impacts on people and farmland throughout the state, the hardest hit areas will be in predominantly poor and minority communities—especially in the Central Valley where employment losses and environmental effects will be the most prevalent. As a result, water export losses have the potential to disproportionately impact disadvantaged communities and persons.

5. Biological Resources, Including Fish, Wildlife, And Plant Species

Perhaps more than any other resource category, the evaluation of impacts to biological resources will entail a multi-fold analysis. On one hand, reduced Delta exports will impact biological resources dependent upon imported water from the CVP or SWP for their sustenance. Indeed, wetland and riparian areas across the state, including some national and local wildlife refuges, are maintained, in part, by imported water supplies from the CVP and SWP. The fallowing of fields in response to the reduced availability of CVP and SWP water supplies also increases the proliferation of weeds and other invasive species. Invasive species can harbor disease, choke out native species, adversely affect transportation corridors, and clog irrigation canals.

On the other hand, the EIS will also have to assess the impacts or biological benefits, if any, to the listed species and other biota from the various alternatives evaluated. The Public Water Agencies believe that this portion of the NEPA analyses will provide vital information for the public and decision makers. A major value of NEPA comes in the comparison that may then be made between the effects on the listed species of the no action alternative compared to the other alternatives. Alternatives can also be compared among themselves. In evaluating and comparing these action alternatives, NEPA requires that Reclamation discuss the level of uncertainty and conflicting information in the data used to develop the impacts analyses. Making this information available to the public and decision-makers will allow a fully informed

decision to be made and provide clear explanation and accountability for that discretionary choice.

6. Water Quality

Reduced water supplies impact water quality by reducing water agencies' ability to blend lower quality water (e.g., from local groundwater or recycled water) with the higher quality Delta water, which is frequently needed to make the latter water sources beneficially usable. Increased pumping of local groundwater to offset export losses can adversely affect water quality by drawing poor quality or brackish water into higher quality groundwater basins. Increased reliance on groundwater for irrigation can also negatively impact the water quality of surface water streams due to the leachates present in the groundwater that becomes stream runoff.

7. Air Quality

Reduced Delta water supply deliveries can adversely impact air quality because land fallowing generally results in increased dust and particulate emissions. Additionally, increased air emissions will occur because of the greater amount of energy that is needed for groundwater well pumps to lift water from a lower depth due to the greater reliance on and depletion of groundwater reserves associated with reduced availability of export water supplies.

8. Soils, Geology, And Mineral Resources

Reduced Delta water supplies impact soils, geology, and mineral resources because increased groundwater use results in soil subsidence due to reduced groundwater replenishment. In turn, greater deposits of salts that negatively affect soil quality occur as a result of relying more heavily upon lower quality groundwater sources. In addition, reduced agricultural planting and increased fallowing leads to greater topsoil lost to erosion.

9. Visual, Scenic, Or Aesthetic Resources

Aesthetics are impacted by reduced water supplies because resulting socioeconomic impacts from lost agricultural employment will affect urban decay in regions affected by resulting employment losses. Lower reservoirs and water levels in the upper watersheds from restrictions that require reservoir releases, and barren and decaying farmland where planting and maintenance is infeasible due to the unavailability of delta water supplies, will have negative aesthetic impacts. Increased reliance on groundwater can also negatively impact aesthetic resources by causing damage to infrastructure from land subsidence.

10. Global Climate Change, Transportation, And Recreation

Reduced water supplies from the Delta and increased reservoir releases to meet RPA requirements can also impact climate change due to the greater amount of energy and resulting emissions needed for pumping groundwater from greater depths, reductions in carbon uptake by plants, and changes in the timing and magnitude of project hydropower generation. Transportation can be impacted by greater impediments from blowing dust on fallowed lands,

tumbleweeds, and bird-on-aircraft strikes. Recreation impacts are also likely to occur due to impacts on reservoir levels and upper watershed flows.

B. Comparison Among Alternatives

One of the key values of an EIS is its ability to inform the public and decision-makers of the relative environmental and socioeconomic costs and benefits of each alternative, including the no action alternative. An EIS does so by including information and analyses that allow and provide a comparative assessment of the environmental impacts or benefits among these alternatives. Accordingly, in the forthcoming EIS Reclamation must provide a comparison of the benefits and/or impacts of each alternative on all the various resource categories. Because part of the purpose and need entails ESA compliance by operating the projects to avoid jeopardizing the species or adversely modifying their critical habitats, it is critical that the EIS at a minimum provide analyses and descriptions for the no action alternative and the various other alternatives of the estimated increase or decrease in: (1) the numbers of individuals of each species, (2) the estimated population viability of the listed species, and (3) the amount or quality of their critical habitats. This is not an exhaustive list, and Reclamation should determine if other biological metrics would also be useful and appropriate. Because maintaining the projects' water supply reliability is a key aspect of the purpose and need, Reclamation should provide a commensurate level of analysis and detail regarding the degree to which each alternative would impair the ability of the CVP and SWP to serve their water supply functions.

In addition to including extensive analyses and discussion, the Public Water Agencies agree with Reclamation's recently released NEPA Handbook, which states:

> A summary table comparing the impacts of all alternatives (including no action) should be attached to the end of the alternatives chapter. Whenever possible, numerical comparisons should be used. Brief narrative comparisons are permissible if numerical comparisons cannot be made. ... The graphic display should provide a comparison of the tradeoffs between alternatives and a listing of proportionate effects and merits of each alternative.

NEPA Handbook at 8-13. Dually providing analytic information in both text and tabular or other graphic formats will best provide full and understandable disclosure to the public and decision-makers of the relative merits of each action alternative and the no action alternative, and better inform and support any policy decisions Reclamation makes at the end of the NEPA and ESA consultation processes.

C. Cumulative Impacts

NEPA requires that an EIS also include an analysis and discussion of cumulative environmental impacts, which must discuss the likely long-term impacts from each alternative in conjunction with other reasonably foreseeable actions and future events. As discussed elsewhere in this letter, there are numerous other stressors currently affecting the listed species that are or may be having a cumulative effect on the species. We earlier suggested developing alternatives

to address these impacts. The Public Water Agencies also encourage Reclamation to explore in the EIS whether any mitigation would address these other causes of cumulative effects, which could maintain or improve the conditions of any of the listed species so as to allow sustained and improved project operations for water supply reliability.

Additionally, there are numerous actions that have recently been completed or are currently being implemented by private, local, state, and federal actors throughout the project area to improve the habitat and status of the listed species whose benefits to the species must be taken into account in all the alternatives. These actions include gravel augmentation to improve salmon spawning conditions, changes in the operations or physical character of diversions (better screens or ladders), and modifications to other structures to improve passage for salmonids and green sturgeon. For example, a new biological opinion on the Yuba River requires the Army Corps of Engineers to implement extensive gravel augmentation and improvements to fish ladders on that tributary for the benefit of salmonids. Similarly, the operations of the Red Bluff Diversion Dam on the Sacramento River have been and will be modified in the future in a manner that will benefit survival, spawning, and passage of salmonids and the green sturgeon as a result of construction of new alternate diversion structures to serve the Tehama-Colusa Canal Authority. There are also other extensive habitat restoration plans ongoing in the Delta and on the San Joaquin River, as well as other Delta tributaries. While a comprehensive listing is not possible here, Reclamation must identify and discuss these ongoing and planned projects and programs and include the estimated improvements to the status of the listed species and their habitats in their evaluation of the impacts of the alternatives, including the no action alternative. At a minimum, the expected beneficial impacts of requirements in other biological opinions issued by FWS and NMFS that address the listed species at issue here must be identified and included in the analysis.

D. Disclosure And Discussion Of Scientific Uncertainty And Data Gaps

Part of the value of the NEPA process is its requirement to disclose and discuss the relevance of conflicting, inconsistent data and unavailable or incomplete data. Past regulatory decisions taken without the guiding light of NEPA have been made with an unjustified claim of certainty or necessity without acknowledgment of the significant uncertainty or imprecision that accompanied such actions. This obscures the true weight of the policy decisions set before the agency, and discourages honest and critical evaluation of policy options. Accordingly, when Reclamation is "evaluating the reasonably foreseeable significant adverse effects on the human environment in [the EIS] and there is incomplete or unavailable information," it is required to "always make clear that such information is lacking." 40 C.F.R. § 1502.22. If, for example, there is incomplete or unavailable information regarding the effects of the proposed action and the alternatives on salmonids and/or Delta smelt, Reclamation must disclose and discuss this issue. However, "[e]very effort should be made to collect all information essential to a reasoned choice between alternatives." NEPA Handbook at 8-16. At a bare minimum, if the relevant incomplete information "cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known," Reclamation must include a statement in the EIS explaining the nature of such information, its relevance, a summary of existing credible scientific evidence, and Reclamation's evaluation of potential impacts based on approaches or methods generally accepted in the scientific community. 40 C.F.R. § 1502.22(b).

In 2004, the National Research Council issued a report addressing the degree of scientific certainty, or lack thereof, regarding measures imposed under the ESA for the protection of listed fishes in the Klamath River basin. National Research Council, *Endangered and Threatened Fishes in the Klamath River Basin: Causes of Decline and Strategies for Recovery.* Washington, DC: The National Academies Press, 2004. To accomplish their charge, the committee developed "specific conventions for judging the degree of scientific support for a proposal or hypothesis" in the Klamath biological opinions. *Id.* at p. 35. The committee summarized these conventions in the following table:

TABLE 1-2 Categories Used by the Committee for Judging the Degree of Scientific Support for Proposed Actions Pursuant to the Goals of the ESA

Basis of Proposed Action	Scientific Support	Possibly Correct?	Potential to be Incorrect
Intuition, unsupported assertion	None	Yes	High
Professional judgment inconsistent with evidence	None	Unlikely	High
Professional judgment with evidence absent	Weak	Yes	Moderately high
Professional judgment with some supporting evidence	Moderate	Yes	Moderate
Hypothesis tested by one line of evidence	Moderately strong	Yes	Moderately low
Hypothesis tested by more than one line of evidence	Strong	Yes	Low

These or similar criteria should be explicitly applied in the NEPA process here to assess the strength of any scientific justification for proposals to restrict project operations and intended to benefit listed species. Doing so will assist policymakers and the public in better understanding the choices to be made among alternatives.

Some have sought to justify restrictions on CVP and SWP operations even in the absence of substantial scientific support based on the "precautionary principle." As the Klamath report observed, however, "even when a policy decision is made to apply the precautionary principle, the question of whether the decision is consistent with the available scientific information is important. . . . At some point [] erring on the side of protection in decision-making ceases to be precautionary and becomes arbitrary. One indication that policy-based precaution has given way to bias or political forces is a major inconsistency of a presumed precautionary action with the available scientific information." *Id.* at 315. If the federal agencies make a policy decision to apply the precautionary principle here, that choice should be explicit, so that the choice and the tradeoffs involved are made clear to the public and any reviewing courts. That policy choice has not been made explicit in past decisions. In the litigation regarding the 2009 Salmonid BiOp, for example, NMFS sought to justify a restriction on OMR flows based on precaution, but as the

district court found "nowhere in the BiOp (or any other document in the administrative record cited by the parties) [did] NMFS disclose its intent to use a 'precautionary principle' to design the RPA Actions." *Consolidated Salmonid Cases*, 713 F. Supp. 2d 1116, 1145 (E.D. Cal. 2010).

In sum, Reclamation should be explicit in identifying the scientific uncertainty associated with any restrictions on project operations that are proposed as necessary to comply with the ESA.

E. Information Quality Act

The Information Quality Act (Public Law 106-554) and orders, regulations, and guidelines issued thereunder impose additional requirements on Reclamation that must be applied to this NEPA process. Reclamation recently issued its peer review policy to implement the mandate in the Office of Management and Budget's Bulletin and Guidelines that important scientific information "shall" be peer reviewed by qualified specialists before being used to inform a government decision ("IQA Policy"). Reclamation's IQA Policy requires peer reviews of all scientific information that is determined to be "influential scientific information" or "highly influential scientific assessments." The IQA Policy applies to NEPA documents:

> This policy applies to all scientific information produced, used, or disseminated by Reclamation. This includes scientific information that, along with other factors, informs a policy or management decision. For example, this Policy applies to scientific components of an environmental document prepared pursuant to the National Environmental Policy Act that present a scientific evaluation or are otherwise based upon scientific information.

(Reclamation IQA Policy section 5(B)) The forthcoming EIS will likely qualify for peer review under Reclamation's policy either as a "highly influential scientific assessment" or an "influential scientific assessment" based on the level of controversy, potential for societal and resource impacts or implications, the degree to which the scientific information may be novel or precedent setting, and the clear and substantial impact on important public policies and private sector decisions that may be implicated. Accordingly, the Public Water Agencies urge Reclamation to be prepared to implement the IQA peer review policy.

VI. CONCLUSION

The Public Water Agencies thank Reclamation for providing the opportunity to submit comments for consideration in the scoping process. These comments are intended to provide Reclamation with a clear understanding of a few of the primary concerns of the Public Water Agencies and their member agencies as they continue the important work of providing safe, sufficient water to millions of Californians and hundreds of thousands of acres of highly productive farmland. The Public Water Agencies reserve the right to submit additional comments as the NEPA process proceeds. The Public Water Agencies, including individual SWC member agencies, as appropriate, look forward to participating as cooperating agencies, to hearing from you regarding a meeting to develop an MOU, and to working with Reclamation in a cooperative manner in developing the environmental review for the OCAP.

Sincerely,

Daniel G. Nelson
Executive Director
San Luis & Delta-Mendota Water Authority

Terry L. Erlewine
General Manager
State Water Contractors, Inc.

Thomas Birmingham
General Manager
Westlands Water District

EXHIBIT A

State Water Contractor Member Agencies

The State Water Contractors' members are: Alameda County Flood Control and Water Conservation District Zone 7; Alameda County Water District; Antelope Valley-East Kern Water Agency; Casitas Municipal Water District; Castaic Lake Water Agency; Central Coastal Water Authority; City of Yuba City; Coachella Valley Water District; County of Kings; Crestline-Lake Arrowhead Water Agency; Desert Water Agency; Dudley Ridge Water District; Empire-West Side Irrigation District; Kern County Water Agency; Littlerock Creek Irrigation District; Metropolitan Water District of Southern California; Mojave Water Agency; Napa County Flood Control and Water Conservation District; Oak Flat Water District; Palmdale Water District; San Bernardino Valley Municipal Water District; San Gabriel Valley Municipal Water District; San Gorgonio Pass Water Agency; San Luis Obispo County Flood Control & Water Conservation District; Santa Clara Valley Water District; Solano County Water Agency; and Tulare Lake Basin Water Storage District.

San Luis & Delta-Mendota Water Authority Member Agencies

The Authority's members are: Banta-Carbona Irrigation District; Broadview Water District; Byron Bethany Irrigation District (CVPSA); Central California Irrigation District; City of Tracy; Columbia Canal Company (a Friend); Del Puerto Water District; Eagle Field Water District; Firebaugh Canal Water District; Fresno Slough Water District; Grassland Water District; Henry Miller Reclamation District #2131; James Irrigation District; Laguna Water District; Mercy Springs Water District; Oro Loma Water District; Pacheco Water District; Pajaro Valley Water Management Agency; Panoche Water District; Patterson Irrigation District; Pleasant Valley Water District; Reclamation District 1606; San Benito County Water District; San Luis Water District; Santa Clara Valley Water District; Tranquillity Irrigation District; Turner Island Water District; West Side Irrigation District; West Stanislaus Irrigation District; Westlands Water District.

EXHIBIT B
SCIENTIFIC DEVELOPMENTS
2009-CURRENT

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EXHIBIT C

RATIONALE FOR EXCLUDING ALTERNATIVES FROM THE EIS THAT IMPOSE PROJECT OPERATIONAL RESTRICTIONS FOR MANAGING THE LOCATION OF X2 IN THE FALL

a. Recent Life-Cycle Models Uniformly Conclude That X2 Location Is Not A Significant Factor Affecting Subsequent Delta Smelt Abundance

In the last three years, peer-reviewed delta smelt life-cycle modeling studies have been undertaken by Maunder & Deriso (2011), MacNally et al. (2010), Thomson et al. (2010), and Miller et al. (2012). These published works have assessed the importance of a suite of factors on Delta fish species, with particular focus on delta smelt. None of the studies found evidence of a relationship between the location of X2 and subsequent delta smelt abundance. FWS, First Draft 2011 Formal ESA Consultation on Proposed Coordination of CVP and SWP p. 268 (Dec. 2011).

In addition, the National Research Council reviewed the studies the 2008 Delta Smelt OCAP biological opinion relied upon as support for regulating the position of fall X2 and concluded that the BiOp's reliance on Feyrer et al. (2007) was improper, due to the study's unacknowledged uncertainty arising from improperly linking several statistical models, as well as the lack of rigor in the analysis (National Research Council 2010). A federal district court also examined several of the studies relied upon in the BiOp, including Feyrer et al. (2007, 2011), and reached the conclusion that the best available science did not demonstrate a relationship between fall X2 location and subsequent delta smelt abundance (X2 Decision 2011). The court also noted that the Feyrer analyses were limited to an examination of abiotic habitat factors which ignored species' food supplies and other biotic factors. X2 Decision at 34-36, 132 (2011) (*In re Consol. Delta Smelt Cases*, 812 F. Supp. 2d 1133 (Aug. 31, 2011)). Moreover, the Feyrer studies themselves acknowledged that their analysis was limited and not appropriate for use as a regulatory mechanism (Feyrer et al. 2007).

b. Historical Survey Data Show That Delta Smelt Distribution Only Weakly Overlaps The LSZ, And Thus the LSZ Should Not Be Used As A Habitat Surrogate

Historic survey data show that regulating SWP and CVP operations to manage the location of fall X2 is unnecessary to expand the geographic area utilized by pelagic fish species, such as delta smelt. Contrary to assumptions relied upon, for example, in the 2008 Delta Smelt OCAP biological opinion, applicable survey and other data show that the distribution of delta smelt in the fall occurs over a wide range of environmental and salinity conditions, ranging approximately 40 km from Suisun Bay to the Cache Slough region in nearly all years. The LSZ is often referred to as stretching from 0.5 to 6 psu; however, survey data show that delta smelt can be found at salinities substantially greater than 10 psu downstream from the LSZ, and are frequently found in substantial numbers in freshwater portions of the Delta upstream from the LSZ such as the Cache Slough Complex.

Thorough analysis of data collected in California Department of Fish and Game ("CDFG") Fall Midwater Trawl ("FMWT"), 20 mm, and Summer Townet ("STN") surveys has failed to identify *any* correlation between the location of X2 in the fall and delta smelt distribution, reproduction, or food availability (Hanson 2011). Reclamation's own biologist, Matt Nobriga, testified during a hearing before the federal district court that: "I think that in terms of the historical data, that the three models probably indicate there's – that you're not going to find a correlation out of the historical data." *Consolidated Delta Smelt* Cases, 812 F. Supp. 2d 1133, 1160 (E.D. Cal. 2011). Thus, the analysis of survey data is consistent with the conclusions reached in the delta smelt life-cycle modeling efforts: there is no relationship between fall X2 location and delta smelt abundance.

More recent analyses of the historical survey data also show that the geographic distribution of delta smelt is much broader than previously acknowledged—covering more than 51,800 hectares and areas beyond the LSZ. Merz et al. (2011) extensively reviewed the relevant survey data and concluded that year-round populations of delta smelt are likely present in the lower Sacramento River to Suisun Marsh region, as well as in the Cache Slough, and Sacramento Deepwater Ship Channel region of the northern Delta. Merz et al. (2011) also noted observations of delta smelt at the most upstream sampling station locations, thus indicating that the current surveys may not capture the full extent of smelt distribution upstream of the LSZ. In terms of highest delta smelt densities, the study found that spawning seems to occur in vast regions of the Delta (i.e., Suisun Marsh, Cache Slough, the lower Sacramento River, and Napa River); rearing occurs mainly in Grizzly Bay and the lower Sacramento River; and adults (i.e., the migration phase) tend to occur further east, near the confluence of the Sacramento and San Joaquin Rivers and into the lower Sacramento River region. The existence of a year-round demographic unit of delta smelt in the Cache Slough region also demonstrates that it is likely not a semi-anadromous species as previously believed (Baxter et al. 2010).

The FMWT did not begin surveying in the Cache Slough and Sacramento River Deep Water Ship Channel region until 2009, and the STN survey was not expanded to these areas until 2011. Thus, previous studies ignored a substantial region occupied by the delta smelt population. Indeed, a federal district court, relying on admissions made by the primary author of the studies, found that Feyrer et al. (2007, 2011) studies did not consider the region of Cache Slough in their analyses. 812 F. Supp. 2d at 1155-56; 1201-1202. However, some of the highest densities of larva and juveniles have been sampled in this region in recent years, suggesting that the range of delta smelt spawning and rearing includes areas a significant distance from Suisun Bay. The current scientific consensus is that delta smelt are not restricted solely to the LSZ and that management efforts need to incorporate measures not singly focused on X2 location in the fall.

It is also beyond scientific dispute that habitat is a species-specific concept, and the habitat of a species includes the geographic areas it occupies, all the resources it uses, and the conditional states of those resources. X2 is a poor surrogate of habitat for delta smelt, not only because much of the population resides in areas outside the LSZ, but also because many parts of the LSZ have not been occupied by delta smelt during most of the past decade despite those areas' regularly having salinities within the LSZ range. Thus, it is apparent that delta smelt habitat is not defined by salinity because the LSZ in autumn only weakly overlaps the

distribution of delta smelt. Because extensive areas of the LSZ do not support delta smelt, much of the LSZ should not be considered habitat for delta smelt.

In addition, the delta smelt located in the upstream, freshwater environment of Cache Slough—which in recent years have comprised as much as one-third of the total number of individuals observed in surveys—are largely unaffected by winter and spring objectives related to X2 and outflow. Rather than migrating upstream to spawn and downstream to rear, the delta smelt appear to simply spread out into available habitat.

c. Conclusion Re Fall X2

Productivity in the LSZ has been drastically limited by springtime suppression of phytoplankton blooms from ammonium loading and feeding by the *Corbula amurensis* clam, which has resulted in a reduced carrying capacity in the Suisun Bay region (Glibert 2010, Kimmerer 2009, Kimmerer 2006). However, the delta smelt occupies a much larger area than just the LSZ (Baxter et al. 2010, Hanson 2011). These and other factors show that regulatory efforts should be directed toward life-cycle modeling related to the relevant fish species to help better determine what factors (e.g., ammonium loading and food supply) are contributing to reductions in delta smelt abundance and how those factors can be addressed to improve the health and numbers of the species. Reclamation cannot promote an action based on a one-size-fits-all variable when there are many more complex interacting variables in the Delta ecosystem that must be addressed for the species' recovery.

The Public Water Agencies are legitimately concerned with FWS's and Reclamation's prior presumptions that the LSZ (and thus any impact from the SWP and CVP on the downstream extent of the LSZ) determines species abundance. Efforts to bolster this flawed hypothesis should be abandoned, the location of fall X2 should not be a primary focus of any regulatory regime, and efforts should rather focus on the proven drivers of species abundance that would improve habitat for delta fishes.

EXHIBIT D

ENVIRONMENTAL IMPACTS

As explained above, the Public Water Agencies submit that a scientifically rigorous analysis of the effects of CVP and SWP operations in accordance with ESA section 7 will conclude that operations are not likely to jeopardize the listed species or adversely modify their critical habitat. Accordingly, no major changes to CVP and SWP operations should be required to comply with the ESA, and there should be no loss of water supplies and associated impacts. The proposed action should not include major changes to CVP and SWP operations. However, to the extent that Reclamation considers alternative actions involving changes to CVP and SWP operations, and those changes to operations would reduce water supplies, then Reclamation must analyze and disclose the associated impacts. The following discussion is intended to assist Reclamation in identifying potential impacts related to loss of CVP and SWP water supplies resulting from such alternatives.

1. Water Resources, Including Groundwater

Reduced deliveries of Delta water supplies into the service areas of the Public Water Agencies member agencies have demonstrable, dramatic, and undeniable impacts on groundwater pumping, risk of groundwater overdraft, local surface water supplies, provision of emergency services, the ability to suppress wildfires, and a host of other impacts. Operational changes to the projects necessary to meet OMR and other flow requirements can lead to increased reservoir releases in the spring, decreased reservoir releases in the summer, decreased reservoir carryover storage, and decreased Delta export pumping.

a. Loss Of Surface Water Supplies For End Users

By way of background, it is undeniable that reduced Delta exports result in reduced supplies in the SWP and CVP service areas. It was undisputed in the delta smelt and salmonid district court cases that "every acre-foot of pumping foregone during critical time periods is an acre-foot that does not reach the San Luis Reservoir where it can be stored for future delivery to users during times of peak demand in the water year."[1] It is also "beyond dispute" that water supply reductions from the BiOps have the potential to significantly affect the human environment.[2]

"The quantity of water lost through pumping reductions translates directly into water losses for urban and agricultural users."[3] "In the SWP service area, one acre-foot of water serves about five to seven people for one year."[4] "Water loss for agricultural users results in reduction

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[1] *Consolidated Salmonid Cases*, 713 F. Supp. 2d 1116, 1148 (E.D. Cal. 2010).
[2] *Consolidated Salmonid Cases*, 688 F. Supp. 2d 1013, 1034 (E.D. Cal. 2010).
[3] 713 F. Supp. 2d at 1151.
[4] 713 F. Supp. 2d at 1151; PI Transcript 186:25-187:1-3 (April 6, 2010).

in the number of acres that may be sustained with actual water supply."[5] In the SWP service area, it takes approximately 3 acre-feet of water per acre to sustain a crop for a growing season.[6]

b. Operational Constraints, Non-Project Factors, And Water Demand May Exacerbate Water Supply Impacts From Pumping Restrictions

The level of San Joaquin River flow at Vernalis affects OMR flows, which in turn affects the magnitude of the impact of the OMR flow restrictions.[7] Export facility capacities (either their physical capacity or their operational capacity) can restrict exports under wetter conditions, as occurred in the case of the SWP's pumping facilities on several occasions in January of 2011 due to equipment availability and personnel issues. Project demands can affect the level of exports. Irrigation demands, in particular, are low during the months of December through February, and begin to increase in March and during the later spring months. Storage capacity can restrict or expand exports, particularly during the winter months when demands for direct delivery of project water are lower. Exports at the SWP's Banks Pumping Plant can also be increased when the federal share of San Luis Reservoir fills and pumping capacity at the CVP's Tracy Pumping Plant is available to be used to enhance the pumping capacity otherwise available at the Banks Plant alone. Practical operational considerations can also restrict exports because the project operators will generally operate to meet a lower spring OMR flow level than that specified in the RPAs in order to ensure that they do not exceed the specified level. State Water Resources Control Board Water Right Decision 1641 also restricts exports based on several parameters including the export-to-total Delta inflow ratio, thus providing protections to listed species and their habitats.

c. Groundwater Overdraft, Subsidence, Resulting Dangers

Reductions in Delta exports have a direct impact on groundwater levels across the Public Water Agencies' service areas, particularly in agricultural regions.[8] Reduced Delta water means that Public Water Agencies will not be able to replenish and store groundwater, or will be able to do so at a reduced rate, and will also need to rely more heavily upon groundwater reserves to meet demand.[9]

Shortage of surface water supplies, and the corresponding reliance on groundwater supplies, also leads to groundwater overdraft, which occurs when pumping exceeds the safe yield of an aquifer.[10] When water is removed from the spaces between the particles in the sediment,

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[5] 713 F. Supp. 2d at 1151.
[6] 713 F. Supp. 2d at 1151; PI Transcript 187:22-25 (April 6, 2010).
[7] *See* Erlewine Decl. (Doc 816) at 3, Delta Smelt Consol. Cases (Feb. 2011).
[8] *Consolidated Delta Smelt Cases*, 812 F. Supp. 2d 1133, 1182-87 (E.D. Cal. 2011); Leahigh 2nd Supplemental Declaration re X2 Injunction (Doc. 1006) ¶7, *Consol. Delta Smelt Cases* (Aug. 10, 2011); Erlewine X2 Declaration (Doc. 915) pp. 8-9, *Consol. Delta Smelt Cases* (June 16, 2011).
[9] *Id.*
[10] 713 F. Supp. 2d at 1153; Erlewine X2 Declaration (Doc. 915) pp. 9-11, *Consol. Delta Smelt Cases* (June 16, 2011).

the soils compact, which reduces the volume for water storage.[11] Long-term impacts resulting from overdraft include land subsidence and damage to water conveyance facilities.[12]

Land subsidence is the sinking of the Earth's surface due to subsurface movement of earth materials. The major cause of subsidence in the southwestern United States is the overdrafting of aquifers. The negative effects of land subsidence include the permanent loss of groundwater storage space and changes in elevation and the slope of streams, canals, and drains.[13] Additionally, in some areas where groundwater levels have declined, surface streams lose flow to adjacent groundwater systems.[14] These losses entail significant impacts to hydrology, as well as the biological systems that depend on those groundwater or surface flows. In addition, land subsidence can lead to cracks and fissures at the land surface, which may damage bridges, roads, railroads, storm drains, sanitary sewers, canals, levees, and private and public buildings. Furthermore, land subsidence leads to the failure of well casings,[15] which will require additional well drilling and attendant environmental impacts to air quality.

While urban areas are especially vulnerable to the damaging effects of subsidence, the largest occurrence of land subsidence in the world induced by human activity occurred in California's Central Valley. Prior to the commencement of CVP and SWP surface water imports to the San Joaquin Valley, parts of northwestern Fresno County experienced land subsidence of up to 30 feet as a result of groundwater overdraft in the area.[16] Large portions of the Kern County groundwater basin also experienced subsidence due to overdraft of the aquifer and the lowering of its hydraulic head. In the San Joaquin River and Tulare Lake regions, for example, an area of 5,200 square miles registered at least 1 foot of subsidence.[17] Land subsidence related to groundwater overdraft exceeded 12 feet in portions of Tulare County and 9 feet in the Arvin-Maricopa area.[18]

Since SWP and CVP operations commenced, imported water from the projects has largely eliminated widespread and large-scale subsidence. However, further loss of project water for export threatens to entirely reverse this trend. To the extent the new BiOps involve additional export restrictions, even more groundwater pumping will be required to meet demand, with attendant environmental impacts.[19]

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[11] Declaration of Russ Freeman (Doc. 170) at 5, *Consol. Salmonid Cases* (Jan. 27, 2010).
[12] 713 F. Supp. 2d at 1153; 812 F. Supp. 2d at 1187; Erlewine X2 Declaration (Doc. 915) pp. 9-11, *Consol. Delta Smelt Cases* (June 16, 2011); Declaration of Russ Freeman (Doc. 170) at 5-6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[13] Beck letter, *supra*, at p. 3; Leake, *supra*, at pp. 1-2.
[14] Central Valley Project Improvement Act ["CVPIA"] Programmatic EIS ["PEIS"] (1997) at p. II-5.
[15] Leake, *supra*, at pp. 1-2.
[16] CVPIA PEIS, *supra*, at p. II-28.
[17] *Id.* at pp. II-10, II-28.
[18] *Id.* at pp. II-42, II-43.
[19] Beck letter, *supra*, at p. 2.

d. Increased Demand Upon Alternative Water Supplies Such As Local Surface Water, Local Groundwater, And Colorado River Water

Reduced SWP water supplies will result in increased reliance on Colorado River supplies, which are conveyed through Metropolitan Water District's Colorado River Aqueduct.[20] However, Colorado River supplies have been limited to a basic apportionment of 550,000 acre-feet per year, and they are generally high in salinity (averaging 700 mg/L of total dissolved solids (compared to SWP concentrations that range from 200-300 mg/L)).[21] Thus, blending of SWP water is needed to make use of Colorado River supplies.

e. Responding To Emergencies, Including Earthquakes, Wildfires

Lost surface and groundwater reserves due to reductions and shortages in project supplies additionally impact the ability to store water for dry years and emergencies. This reduced water storage makes areas across central and southern California increasingly vulnerable to emergencies such as wildfires, because less water is available to suppress and control wildfires and to respond to other emergencies.[22]

If a severe earthquake occurred that disrupts or damages SWP infrastructure, inadequate surface and groundwater reserves would also put human health and safety at risk.[23] Furthermore, earthquake damage to levees inside the Delta could significantly disrupt Delta exports and cause the loss of millions of acre-feet of water, further constraining water supplies if adequate reserves are not replenished and maintained with adequate SWP and CVP supplies.[24]

2. Land Use, Including Agriculture

Reduced project deliveries, and the resulting unavailability of adequate water supplies, will result in significant changes in land use. Related impacts include the removal of prime agricultural land from production, fallowing of land, loss of topsoil, shifts toward planting permanent crops, reduced production and yield of crops due to reduce water quality, increased costs to obtain supplemental water, and negative impacts to water management plans that act as source documents for evaluating land use projects.

a. Fallowing Land And Taking Prime Agricultural Land Out Of Production

The federal district court in the *Consolidated Salmonid Cases* found that evidence was established that water losses caused by the NMFS BiOp's RPA would result in a variety of adverse impacts to the human environment, including "irretrievable resource losses" from the

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[20] MWD (Nov. 2008).
[21] MWD (Nov. 2008).
[22] *See* MWD (Nov. 2008); DWR, California's Drought, Water Conditions & Strategies to Reduce Impacts pp.16-17 (March 2009); Governor's Proclamation, State of Emergency-Water Shortage p.3 (Feb. 27, 2009).
[23] *See* MWD (Nov. 2008).
[24] DWR Delta Risk Management Strategy (Feb. 2009) available at http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/drms_execsum_ph1_final_low.pdf.

loss of "permanent crops, fallowed lands, destruction of family and entity farming businesses [and] social disruption and dislocation...."[25]

Agricultural operations in Fresno County, Tulare County, Kern County, San Diego County, and other areas of the State rely on Delta water, and this supply of water has already been impaired by the prior BiOps, with concomitant environmental effects. Farmers have been forced to fallow hundreds and thousands of acres of prime agricultural land as a result of reduced water supplies and uncertainty regarding future water supply.[26] As previously noted, in the SWP service area, it takes approximately 3 acre-feet of water per acre to sustain a crop for a growing season.[27] In the CVP service area, it has been estimated that approximately 400 acres of land may remain out of production for every 1000 acre-feet of water lost.[28] Thus for any reductions in the water supply there will be commensurate reductions in the acreage of crops that can be sustained. Conversely, farmers anticipate that increased water allocations would mitigate anticipated damage to crops in proportion to the amount of water received.[29]

b. Losing Top Soil Due To Erosion

The fallowing of land also leads to greater soil erosion from wind and water, which comprises an additional irretrievable resource loss.[30] Such actions may result in substantial soil erosion and loss of topsoil.[31]

c. Shift To Permanent Crops

Reductions in water supplies have resulted in changed farming practices, such that more permanent crops are grown.[32] However, permanent crops carry an additional risk, because farmers cannot cut back further on the water supply without destroying the crops.[33]

d. Salt Intolerance Limits Some Crops From Being Produced And Reduces Yields

In response to reduced surface water deliveries, farmers must increase their reliance on groundwater, which in many locations is an inferior water source due to its higher salinity.[34] Unfortunately, not all fields and crops can be irrigated with groundwater, and the increased soil salinity from irrigating with saline groundwater impacts the ability to grow certain salinity

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[25] 713 F. Supp. 2d at 1155; Declaration of Russ Freeman (Doc. 170) at 3, *Consol. Salmonid Cases* (Jan. 27, 2010).
[26] 713 F. Supp. 2d at 1152; Declaration of Russ Freeman (Doc. 170) at 3-4, *Consol. Salmonid Cases* (Jan. 27, 2010).
[27] 713 F. Supp. 2d at 1152.
[28] 713 F. Supp. 2d at 1152.
[29] 713 F. Supp. 2d at 1151.
[30] *Consolidated Salmonid Cases*, 688 F. Supp. 2d 1013, 1033-34 (E.D. Cal. 2010).
[31] Beck letter, *supra*, at p. 3.
[32] 713 F. Supp. 2d at 1151.
[33] 713 F. Supp. at 1151-52.
[34] 713 F. Supp. 2d at 1153; Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).

intolerant crops in those areas.[35] Because some crops are particularly sensitive to salinity concentrations, the use of high-salinity water may reduce the yields of these crops.[36]

e. Increased Cost And Infeasibility Of Supplemental Water

Farmers would be required to make up for any shortfall in imported water deliveries by purchasing supplemental water at drastically increased costs, if such supplemental water is even available.[37]

f. Impacts To Water Management Planning Related To Land Use

California law requires all urban water suppliers to prepare urban water management plans every five years to ensure adequate water supplies and for use as a source document for analyzing water supply issues for specific projects under SB 610, SB 221, and the California Environmental Quality Act. The plans must identify and discuss factors affecting current and projected water supplies and demand, and they must identify steps being taken to ensure availability and reliability of supplies. ESA regulatory restrictions that reduce water deliveries for the protection of fish species are one of the main constraints facing water suppliers for providing adequate supplies.[38] Therefore, development projects and land use planning decisions that depend on these plans will also be constrained by any future imported water supply reductions caused by the new BiOps.

3. Socioeconomics

Reduced Delta water supplies also cause socioeconomic impacts. In response to reduced water supplies, farmers fallow fields and this reduced agricultural productivity results in layoffs, reduced hours for agricultural employees, and increased unemployment in agricultural communities. Reduced agricultural productivity also has socioeconomic impacts for agriculuture-dependent business and industries. In addition, the unavailability of stable and sufficient water supplies reduces farmers' ability to obtain financing and result in employment losses, due to the reduced acreage of crops that can be planted and the corresponding reduction in the amount of farm labor needed to manage that reduced acreage. Reduced project export water supplies and the resulting employment losses also cause cascading socioeconomic impacts in affected communities, including increased poverty, hunger, and crime, along with dislocation of families and reduced revenues for local governments and schools.

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[35] *See* 713 F. Supp. 2d at 1153; Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[36] MWD (Nov. 2008); Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[37] 713 F. Supp. 2d at 1151.
[38] Southern California Water Committee, Urban Water Management Plans Fact Sheet, available at http://www.socalwater.org/images/SCWC.UWMP_Fact_Sheet.9.21.11.pdf.

a. Lack Of Ability To Obtain Financing

Water supply uncertainties interfere with farmers' abilities to secure financing for continuing their farming operations.[39] Reduced water availability from the projects frequently results in depletion of supplemental water supplies from local groundwater, which removes the additional water supplies that would be needed for obtaining financing for farming operations.[40] Additionally water constraints would lead to increased payments for supplemental water, which would further affect farmers' cash flows.[41] These financial constraints affect hiring decisions, strain liquidity, and create difficulties for farmers in meeting their payroll obligations.[42]

b. Employment Losses And Resulting Community Impacts

Water supply losses can also be linked to unemployment and related sociological impacts, including poverty, hunger, and crime.[43] Regardless of the season, socioeconomic impacts are likely to result from reduced water supplies.[44] For example, the 2009 delivery reduction that resulted from implementing FWS's 2008 BiOp's RPA resulted in a loss of 9,091 jobs in the San Joaquin Valley, relative to the year 2005, most likely as a result of reduced agricultural acreage under production.[45] Even during wet years, reduced water supplies caused by imposing onerous RPAs can impact employment.[46]

Increased project water allocations prevent layoffs to farm employees.[47] It was undisputed in the federal district court "that farm employees and their families have faced devastating losses due to reductions in the available water supply" and that severe impacts have occurred in the farm economy due to a combination of drought and diversion limitations from the BiOps.[48] The decrease in productive agricultural acres resulted in reduced employee hours, salaries, and positions, which had devastating effects on farm employees and their families.[49] The removal of 250,000 acres from production translated into the loss of approximately 4,200 permanent agricultural worker positions, with even more jobs lost in adjunct businesses, such as packing, processing, and other related services.[50] In spring 2010, it was estimated that wage losses in the agriculture industry would be as much as $1.6 billion during that year.[51]

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[39] 812 F. Supp. 2d at 1187; Stiefvater Declaration re X2 Injunction (Doc. 918) *Consol. Delta Smelt Cases* (June 16, 2011); Mettler Declaration re X2 Injunction (Doc. 919) *Consol. Delta Smelt Cases* (June 16, 2011); 713 F. Supp. 2d at 1152.
[40] 812 F. Supp. 2d at 1187-88.
[41] 812 F. Supp. 2d at 1187-88.
[42] 812 F. Supp. 2d at 1187-88.
[43] 812 F. Supp. 2d at 1188; Sunding Declaration re X2 (Docs. 916 & 986) *Consol. Delta Smelt Cases* (June 16, 2011 & July 15, 2011).
[44] 812 F. Supp. 2d at 1187-88; Sunding Declaration re X2 (Docs. 916) at 1, *Consol. Delta Smelt Cases* (June 16, 2011).
[45] 812 F. Supp. 2d at 1188.
[46] 812 F. Supp. 2d at 1188.
[47] 713 F. Supp. 2d at 1151; Declaration of Chris Hurd (Doc 171) at 3, *Consol. Salmonid Cases* (Jan. 27, 2010).
[48] 713 F. Supp. 2d at 1152; Declaration of Daniel G. Nelson (Doc 172) at 4, *Consol. Salmonid Cases* (Jan. 27, 2010).
[49] 713 F. Supp. 2d at 1152; Declaration of Chris Hurd (Doc 171) at 2, *Consol. Salmonid Cases* (Jan. 27, 2010).
[50] 713 F. Supp. 2d at 1152; Declaration of Russ Freeman (Doc 170) at 7, *Consol. Salmonid Cases* (Jan. 27, 2010).
[51] 713 F. Supp. 2d at 1152; Declaration of Chris Hurd (Doc 171) at 3, *Consol. Salmonid Cases* (Jan. 27, 2010).

Unemployment resulting from water delivery reductions has led to hunger in the impacted San Joaquin Valley communities. For example, one food bank serving Fresno, Madera, and Kings Counties estimated in 2010 that 435,000 people in the area did not have a reliable source of food, that hunger in these communities would continue to increase, and that at least 42,000 people served by the food bank in October 2009 were employed in the farm industry before losing their jobs.[52]

4. Environmental Justice

Although the impacts from reduced water supplies will have significant impacts on people and farmland throughout the state, the hardest hit areas will be in predominantly poor and minority communities—especially in the Central Valley where employment losses and environmental effects will be the most prevalent. These characteristics of the counties in the San Joaquin Valley are illustrated in the tables below, using data from the U.S. Census Bureau.[53]

	Race/Ethnicity, percent of persons, 2010							
County	**White**	**Black**	**American Indian, Alaska Native**	**Asian**	**Native Hawaiian, Other Pacific Islander**	**Reporting 2+ Races**	**Hispanic or Latino Origin**	**White Persons Not Hispanic**
Fresno	55.4	5.3	1.7	9.6	0.2	4.5	50.3	32.7
Kern	59.5	5.8	1.5	4.2	0.1	4.5	49.2	38.6
Kings	54.3	7.2	1.7	3.7	0.2	4.9	50.9	35.2
Madera	62.6	3.7	2.7	1.9	0.1	4.2	53.7	38.0
Merced	58.0	3.9	1.4	7.4	0.2	4.7	54.9	31.9
San Joaquin	51.0	7.6	1.1	14.4	0.5	6.4	38.9	35.9
Stanislaus	65.6	2.9	1.1	5.1	0.7	5.4	41.9	46.7
Tulare	60.1	1.6	1.6	3.4	0.1	4.2	60.6	32.6
California	57.6	6.2	1.0	13.0	0.4	4.9	37.6	40.1

	Income, 2006 - 2010		
County	**Per Capita Money Income in Past 12 Months (2010 dollars)**	**Median Household Income**	**Persons below Poverty Level**
Fresno	$20,329	$46,430	22.50%
Kern	$20,100	$47,089	20.60%
Kings	$17,875	$48,684	19.30%
Madera	$18,724	$46,039	19.30%
Merced	$18,041	$43,844	21.80%
San Joaquin	$22,851	$54,341	16.0%
Stanislaus	$22,064	$51,094	16.40%
Tulare	$17,966	$43,851	22.90%
California	$29,188	$60,883	13.70%

[52] 713 F. Supp. 2d at 1153; Declaration of Dana Wilkie (Doc 173) *Consol. Salmonid Cases* (Jan. 27, 2010).
[53] Information gathered from the U.S. Census Bureau, at: http://quickfacts.census.gov/qfd/states/06/06107.html.

This is even more apparent at the level of local communities within these counties. According to U.S. Census Bureau data, in Huron 96.6% of the population is of Hispanic or Latino origin, and 54.5% of the population is below poverty level. In Mendota, 96.6% of the population is of Hispanic or Latino origin, and 44.6% of the population is below poverty level. In Firebaugh, 91.2% of the population is of Hispanic or Latino origin, and 33.5% of the population is below poverty level. In 2009, each of these communities suffered severe dislocation as a result of water shortages brought about in significant part by ESA related restrictions on water supplies.

5. Biological Resources, Including Fish, Wildlife, And Plant Species

Reduced delta water supplies will have impacts on biological resources, including the reduced ability to supply areas dependent on water supplies from the projects, including wetlands that are maintained, in part, by those supplies. An indirect impact of resulting reduced agricultural production will be the proliferation of weeds and other invasive species, which adversely affect other biological resources.

The EIS will also have to determine and show whether there is any biological benefit to the listed species associated with the alternatives being evaluated. These issues need to be fully addressed in the EIS.

a. Lack Of Water For Wetlands And Species Outside The Delta

Although a biological opinion's purpose is to aid the recovery of listed species, if the expected new BiOps result in reduced project exports, there will also be a significant impact on other protected species, which impacts should be analyzed.

For example, the northwestern portion of Kern County is home to 14,000 acres of flooded water habitat, including the Kern National Wildlife Refuge, where migratory birds, including protected and listed species, nest and feed during the fall and winter. An additional 11,000 acres of recharge ponds are located in the Kern River fan area, which provides seasonal habitat during recharge cycles. These complexes depend on the fall and winter delivery of imported surface water to provide for migratory bird habitat. If the federal action significantly decreases water exports, no Delta water will be available to fill these ponds. Because local surface water supplies to fill the ponds are only available in locally wet years, curtailment of imported water deliveries for the purported benefit of salmonid and delta smelt species would result in the destruction of this habitat for other protected species.[54]

Another example of protected and listed species that could be harmed is found within the boundaries of the Santa Clara Valley Water District—which receives water from both the SWP and CVP. Of the 163 miles of local streams used by Santa Clara for instream groundwater recharge, 129 miles are considered to be habitat for threatened or endangered species, including 32 species of plants, 50 species of wildlife, six amphibians, and three aquatic species listed as special status species under State or federal law. Local reservoirs, streams, and artificial recharge ponds provide habitat for 11 native species and 19 nonnative species of fish. Populations of protected steelhead trout are known to exist in Coyote Creek, Guadalupe River,

[54] Beck letter, *supra*, at p. 3.

Stevens Creek, and San Francisquito Creek and their tributaries. Santa Clara's average in-stream flow releases for groundwater recharge are normally about 104,000 acre-feet. Project export restrictions could reduce these flow releases, which in turn could significantly impact these species.[55]

Furthermore, in the San Joaquin Valley, there are protected oak woodlands that serve as habitat for many other sensitive species. These woodlands and the species they support rely on groundwater and would be injured by further drops in groundwater levels due to increased pumping in response to a curtailment of imported water deliveries.[56] Similar impacts would be felt on other protected species throughout the SWP and CVP service areas. These potential impacts to other listed species must be analyzed in the EIS.

b. Proliferation Of Weeds

Non-cultivated fallow fields can be excellent habitat for non-native weed species such as tumbleweeds (Russian thistle), which break from the soil and are transported with the wind. Proliferation of these weeds in turn "clog irrigation systems, are hazardous to automobile traffic, spread wildfires and harbor insect pests that transmit viruses to many vegetable crops."[57]

c. Beneficial Effects On The Listed Delta Species

The EIS must analyze both adverse and beneficial effects.[58] Therefore, a discussion must also be included to show the beneficial effects of the action, if any, on the listed species. These statements must be objective, balanced, and substantiated with evidence.

6. Water Quality

Reduced imported water supplies impact water quality by reducing water agencies' abilities to blend lower quality water with the higher quality Delta water. For example, local water agencies' beneficial use of recycled water frequently requires blending. Increased reliance on groundwater supplies also affects water quality by drawing in unusable saline, poor quality water from areas adjacent to usable sources. Use of groundwater also impacts the water quality of surface water streams due to the leachates that are present in the groundwater that becomes runoff into local streams.

a. Need For High Quality Delta Water For Blending

Because of varying levels of quality in the water sources available, some water agencies must manage the salinity of the water they provide in order to maximize water use and meet the

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[55] *See* Declaration of Joan Maher in Reply to Proposal on Interim Remedy, *NRDC v. Kempthorne*, No. 1:05-cv-1207-OWW-LJO ¶ 17 (Aug. 10, 2007).
[56] Beck letter, *supra*, at p. 3.
[57] Lincoln Smith, Biological Control of Russian Thistle (Tumbleweed) (2008) http://www.cwss.org/proceedingsfiles/2008/90_2008.pdf.
[58] Ron Bass, The NEPA Book p 110 (2001); 40 C.F.R. § 1508.8 ("Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.").

demands for drinking water of the citizens they serve. Water from the Delta, which is of high quality, is necessary to allow for the utilization of other water supplies. For example, Delta water is frequently mixed with lower quality water from other sources before it is provided to Southern California residents for drinking and agricultural uses. The saline geology in the Colorado River Basin causes water from that source to generally be high in total dissolved solids, averaging about 700 mg/L. By contrast, SWP supplies tend to have low TDS concentrations in the range of 200-300 mg/L.[59] Because Colorado River water is highly saline, State Contractor member agencies that use Colorado River water, including Metropolitan, must blend that water with higher quality SWP water in order for the Colorado River water to be usable for drinking water uses or for water banking.[60]

Metropolitan's blending practices provide an example of the necessity of high quality SWP water deliveries. Metropolitan has adopted a policy to achieve blends of these source waters that do not exceed TDS concentrations of 500 mg/L. Metropolitan adopted this standard because salinities higher than this level would increase service costs, decrease the amount of water available, and reduce operating flexibility. For example, high salinity water has a residential impact resulting from the increased degradation of water heaters and other plumbing fixtures. Further, direct treatment of saline water without blending is costly and typically results in losses of up to 15 percent of the water processed. In addition, water with a high salinity content results in more saline wastewater, which lowers its usefulness and increases the costs of treating and utilizing recycled water.[61] If low salinity water is not available, membrane treatment must be used, which result in losses of up 15 percent of the water processed and increased costs.[62]

Unless higher salinity water is treated or blended, it will affect agricultural use and degrade the quality of soils in their service areas. In addition, degradation of the water available for groundwater recharge could limit the use of local groundwater basins for storage due to the inability to meet basin plan water quality objectives established by the RWQCBs. Thus, when SWP supply water is inadequate to blend with more saline Colorado River water supplies, imported Colorado River water cannot be used to recharge groundwater basins without concern for compromising the water quality objectives of the groundwater basins.[63] This would exacerbate the impacts to groundwater caused by any water curtailments required by the action.[64]

b. Inability To Use Recycled Water

Groundwater basins within the service areas of some of the SWC's member agencies are recharged with recycled water, thereby reducing the demand for imported water. However, each cycle of urban use of recycled water typically adds 250 to 400 milligrams per liter ("mg/L") of total dissolved solids ("TDS"). When wastewater flows already have high salinity concentrations, the use of recycled water becomes more limited or will require much more

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[59] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 1.
[60] Andrew, John T., *Water Quality, California, 2004: California Water Plan Update 2005*, at pp. 21-22.
[61] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 1; CVPIA PEIS, *supra*, at p. II-16, attached hereto and made a part hereof.
[62] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 1.
[63] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 3.
[64] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 1.

expensive treatment. Consequently, more and more high quality blend water is required to render this recycled water usable for groundwater recharge and other activities. Some Regional Water Quality Control Boards of the State of California ("RWQCBs") have adopted water quality control plans for groundwater basins within their jurisdictions that include water quality objectives for maximum amounts of TDS. When inadequate amounts of high-quality SWP or CVP blend water are available to meet the water quality requirements of RWQCB orders for recycled water recharge, recycled water cannot be used for recharge and member agencies must consequently defer, or abandon, water recharge efforts. Loss of high quality water to blend with recycled water for recharge thus contributes to additional groundwater recharge losses and the growing overdraft of groundwater basins in Southern California and the San Joaquin Valley.[65]

Recycled water is also frequently used for landscape and agricultural irrigation, as well as industrial applications. However, such reuse becomes problematic at TDS concentrations of more than 1,000 mg/L. Some crops are also particularly sensitive to high TDS concentrations, and the use of high salinity recycled water may reduce the yields of these crops. In addition, concern for water quality in groundwater basins may lead to restrictions on the use of recycled water for irrigation on lands overlying those basins. In the past, reduced SWP supplies have been responsible for increased total dissolved solids concentrations in Metropolitan's blends, which has resulted in documented impacts to Metropolitan's ability to utilize recycled water and provide replenishment service to groundwater basins.[66] Further reductions in delivered SWP and CVP supplies would result in even greater impacts of this type in Metropolitan's and other service areas.[67]

c. Increased Infiltration Of Poor Quality Water In The San Joaquin Valley

In the San Joaquin Valley, there are large areas of saline, poor quality groundwater adjacent to usable, higher quality groundwater.[68] When replenishment of groundwater is reduced, higher quality groundwater levels are drawn down and cause the poor-quality groundwater to be intermixed with good-quality groundwater, thus leading to significant groundwater quality impacts.[69]

d. Runoff Affects Streams

There could also be potential impacts to local streams and wildlife caused by the heavier reliance upon water groundwater for irrigation.[70] Selenium levels are often high in runoff from farms due to concentrations found in the groundwater.[71]

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[65] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 3.
[66] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 4.
[67] Metropolitan, *Impacts of Loss of SWP Supplies*, *supra*, at p. 3.
[68] 812 F. Supp. 2d at 1187.
[69] 812 F. Supp. 2d at 1187.
[70] 688 F. Supp. 2d at 1033-34.
[71] *See, e.g.*, Reclamation, Grassland Bypass Project, http://www.usbr.gov/mp/grassland/.

7. Air Quality

Reduced delta water supplies impact air quality in areas that can no longer sustain the same acreage of agricultural crops because of the increased dust and particulate emissions resulting from land fallowing. There will also be emission impacts related to the greater amount of energy that is needed for groundwater well pumps to lift water from a lower depth due to the greater reliance on groundwater reserves.

a. Dust From Fallowing

Water losses caused by reduced project exports can result in air quality reduction because fallowing land increases the levels of airborne dust and particulate matter.[72] Non-irrigated fields in this semi-arid region can often produce dust during frequent wind events that occur throughout the region compounding the already significant number of respiratory ailments associated with the San Joaquin Valley such as asthma. Increased airborne dust also increases the risk of exposure to a fungus that lives in the San Joaquin Valley soils, which causes the infection commonly referred to as "Valley Fever." Valley Fever typically causes an infection in the lungs but in some cases, the infection spreads throughout the body and can cause death.

The San Joaquin valley is designated as nonattainment for PM 2.5 and PM 10 under state standards, and for PM 2.5 under federal standards.[73] Those conditions are worsened by dust emissions resulting from water shortages. For example, additional fallowing and under-irrigation of agricultural lands that could result in Kern County Water Agency, one of the SWC member agencies, due to further restrictions on Delta exports could add hundreds of tons per year of wind-borne particulates in the air in the San Joaquin air basin.[74] The same emission effect occurs from reductions in CVP water supplies to members of the SLDMWA that serve agricultural uses.

As one study explained: "Wind-blown fugitive dust is a widespread problem in the arid west resulting from land disturbance or abandonment and increasingly limited water supplies. Soil-derived particles obstruct visibility, cause property damage and contribute to violations of health-based air quality standards for fine particles (PM-10). These dry lands are often difficult to revegetate, yet they may require immediate stabilization. ... As the forces exerted by the wind overcome the forces that bind soil particles to the surface, soil loss occurs. Dislodged soil particles may roll across the surface (creep), or they may bounce (saltation), dislodging further particles with each impact. This process leads to a cascade effect resulting in massive emissions of dust. Fugitive dust affects crops and native vegetation by abrading and burying plants and by blocking sunlight."[75]

In addition to addressing such impacts under NEPA, Reclamation and the other federal agencies involved here must comply with the federal Clean Air Act, 42 U.S.C. § 7401 et seq.

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[72] 713 F. Supp. 2d at 1152; Declaration of Russ Freeman (Doc 170) at 7-8, *Consol. Salmonid Cases* (Jan. 27, 2010).
[73] San Joaquin Valley Unified Air Pollution Control District, http://www.valleyair.org/aqinfo/attainment.htm.
[74] Beck letter, *supra*, at p. 3.
[75] *California Agriculture* 52(4):14-18. DOI: 10.3733/ca.v052n04p14. July-August 1998.

Among other requirements, no federal agency is permitted to engage in an activity that does not conform to an implementation plan. 42 U.S.C. § 7506.

b. Emissions From Pumping Lift Increases

Increased reliance on groundwater reserves for water supplies also results in increased energy use due to increased pumping lift needed to access deeper groundwater.[76]

8. Soils, Geology, And Mineral Resources

Reduced Delta water supplies could impact soils, geology, and mineral resources, by causing, for example: 1) groundwater overdraft and the resulting subsidence of the soil; 2) the fallowing of lands and the resulting loss of topsoil; and 3) increased reliance on lower quality saline groundwater sources and the resulting increase in soil salinity.

a. Subsidence

As previously noted, surface water shortages and corresponding increases in groundwater usage lead to groundwater overdraft, which occurs when pumping exceeds the safe yield of an aquifer.[77] When water is removed from the spaces between sediments, the soil compact and lose their volume.[78] Long-term impacts resulting from overdraft include land subsidence and damage to infrastructure, including water conveyance facilities.[79]

b. Loss Of Topsoil

As discussed above, fallowing land increases the levels of airborne dust and particulate matter, which thus results in greater erosion and loss of topsoil resources from prime agricultural land.[80]

c. Increased Reliance On Groundwater Degrades The Quality Of The Soil

As previously noted, increased reliance on groundwater reduces the quality of water applied to the soil because groundwater is often more saline than surface water supplies and the application of groundwater, in turn, increases soil salinity.[81] This increased salinity in the soil degrades the quality of the soil for use in agriculture because it impacts the ability to grow certain salinity intolerant crops in those areas and affects the yield of many other crops.[82]

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[76] 812 F. Supp. 2d at 1187; Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[77] 713 F. Supp. 2d at 1153.
[78] Declaration of Russ Freeman (Doc 170) at 5, *Consol. Salmonid Cases* (Jan. 27, 2010).
[79] 713 F. Supp. 2d at 1153; 812 F. Supp. 2d at 1187.
[80] 713 F. Supp. 2d at 1152.
[81] 713 F. Supp. 2d at 1153; Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[82] *See* 713 F. Supp. 2d at 1153; MWD (Nov. 2008); Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).

9. Visual, Scenic, Or Aesthetic Resources

Aesthetics will be impacted from reduced water supplies due to urban decay from socioeconomic impacts, barren and decaying farmland, damage to infrastructure from subsidence, and lower reservoirs and water levels in the upper watersheds.

a. Urban Decay Due To Economic Problems

As previously noted, socioeconomic impacts would result from reduced water supplies. A by-product of resulting poverty would be urban decay in many centers where displaced workers live.

b. Fallowed Land, Dead Crops, Destruction Of Permanent Orchard Crops

As also noted, reduced water supplies result in fallowed land and destruction of permanent orchard crops.[83] In these areas, an otherwise healthy and vibrant landscape, will be replaced with barren and desolate ground, potentially covered with dying or decaying plants.

c. Damage From Subsidence

Overdraft of groundwater reserves can result in land subsidence, which can also result in unsightly damage to infrastructure, including water conveyance facilities.[84]

d. Lowering Of Reservoirs, Lack Of Flows In Upper Watersheds

Restrictions that call for additional, episodic releases from reservoirs in the upper watershed,[85] have potential to substantially alter upper watershed aesthetics by lowering reservoir levels and reducing releases and flows that otherwise would have occurred throughout the year.

10. Global Climate Change, Transportation, And Recreation

Reduced water supplies can impact climate change, due to greater energy being needed and reduce carbon uptake by plants. Transportation can be impacted by greater impediments from blowing dust, tumbleweeds, and bird-on-aircraft strikes. Recreation impacts are also likely due to impacts to reservoir and upper watershed flows.

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[83] 713 F. Supp. 2d at 1151-52.
[84] 713 F. Supp. 2d at 1153; 812 F. Supp. 2d at 1187; Erlewine X2 Declaration (Doc. 915) pp. 9-11, *Consol. Delta Smelt Cases* (June 16, 2011); Declaration of Russ Freeman (Doc. 170) at 5-6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[85] *See, e.g.*, 812 F. Supp. 2d at 1187.

a. Climate Change

Increased reliance on groundwater reserves for water supply will result in increased energy usage due to increased pumping lifts needed to access deeper groundwater.[86]

Land fallowing that results from failing to obtain sufficient water allocations to plant crops will also reduce the amount of carbon sequestration that would have otherwise occurred by planting crops, and would have thereby removed carbon dioxide and other greenhouse gases from the atmosphere.[87]

In addition, use of hydroelectric power in California avoids over 29 million metric tons of carbon pollution each year—equal to the output of over 5.5 million passenger cars.[88] Because of the operational changes to project reservoir releases, reservoir carryover, and Delta export pumping needed for meeting flow requirements, there is potential for drastic changes in the timing and magnitude of project hydropower generation. This impacts the availability and cost of clean electricity, and it also requires energy managers to rely on unclean sources of electricity.

b. Transportation

Increased wind-blown and aerosolized dust and particulate matter from land fallowing, as previously discussed above, in turn impairs major transportation routes throughout the Central Valley.[89]

Fallowing can also increase the incidence of bird-on-aircraft strikes, which impacts air transportation for both domestic and national security purposes.[90]

Fallowed fields are an excellent habitat for tumbleweeds (Russian thistle), which break from the soil and are transported with the wind.[91] Proliferation of these species can hamper highways and canals, among other deleterious effects.[92]

c. Recreation

Lower reservoir levels affect recreation. Restrictions that call for additional, episodic releases from reservoirs in the upper watershed[93] have the potential to substantially alter usability of the upper watershed for recreational purposes by reducing releases and flows that otherwise

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[86] 812 F. Supp. 2d at 1183; Declaration of Russ Freeman (Doc. 170) at 6, *Consol. Salmonid Cases* (Jan. 27, 2010).
[87] *See* 812 F. Supp. 2d at 1187.
[88] Risks Ahead: Flows and the Delta: The Consequences of Using a One-Dimensional Approach to Address a Complex Problem, p.6 (March 2012); Hydrologic Modeling Results and Estimated Potential Hydropower Effects Due to the Implementation of the Sacramento Water Resources Control Board Delta Flow Criteria, December 2011, http://www.sfcwa.org/category/programs/delta_governance_water_management/.
[89] 713 F. Supp. 2d at 1152; Declaration of Russ Freeman (Doc. 170) at 7-8, *Consol. Salmonid Cases* (Jan. 27, 2010).
[90] 713 F. Supp. 2d at 1152.
[91] Lincoln Smith, Biological Control of Russian Thistle (Tumbleweed) (2008) http://www.cwss.org/proceedingsfiles/2008/90_2008.pdf.
[92] Lincoln Smith, Biological Control of Russian Thistle (Tumbleweed) (2008) http://www.cwss.org/proceedingsfiles/2008/90_2008.pdf.
[93] *See, e.g.*, 812 F. Supp. 2d at 1183.

would have occurred throughout the year, and lowering reservoir levels throughout the projects' service areas.[94] Reduced water levels in these areas disrupt recreation and impact entire recreation-based industries that rely on visitors in upper watershed regions such as Shasta, Folsom, and Oroville Reservoirs.[95]

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[94] Risks Ahead: Flows and the Delta: The Consequences of Using a One-Dimensional Approach to Address a Complex Problem, p.7 (March 2012); Hydrologic Modeling Results and Estimated Potential Hydropower Effects Due to the Implementation of the Sacramento Water Resources Control Board Delta Flow Criteria, December 2011, http://www.sfcwa.org/category/programs/delta_governance_water_management/.

[95] Risks Ahead: Flows and the Delta: The Consequences of Using a One-Dimensional Approach to Address a Complex Problem, p.7 (March 2012); Hydrologic Modeling Results and Estimated Potential Hydropower Effects Due to the Implementation of the Sacramento Water Resources Control Board Delta Flow Criteria, December 2011, http://www.sfcwa.org/category/programs/delta_governance_water_management/.