1D.1.12 North Coast Rivers Alliance

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September 28, 2015

VIA EMAIL

Ben Nelson
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Re: NCRA Comments on Draft Environmental Impact Statement: Coordinated Long-Term Operation of the Central Valley Project and State Water Project (Agency/Docket Numbers: RR02800000, 15XR0680A1, RX.17868946.0000000)

Mr. Nelson:

On behalf of North Coast Rivers Alliance ("NCRA") we submit the following comments on the Bureau of Reclamation's ("Reclamation's") Draft Environmental Impact Statement for the Coordinated Long-Term Operation of the Central Valley Project and State Water Project ("DEIS"), which was prepared pursuant to the National Environmental Policy Act, 42 U.S.C. §§ 4332 et seq. ("NEPA"). NCRA strongly supports the *No Action* Alternative, which fully implements the Reasonable and Prudent Alternative ("RPA") actions identified in the 2008 Fish and Wildlife Service Biological Opinion ("2008 FWS BiOp") and 2009 National Marine Fisheries Service Biological Opinion ("2009 NMFS BiOp") (collectively, "BiOps"). NCRA 1

INTRODUCTION

The continued long-term operation of the Central Valley project ("CVP") and State Water Project ("SWP") will adversely affect numerous species reliant on the Delta. The 2008 FWS BiOp "[c]oncluded that 'the coordinated operation of the CVP and SWP, as proposed, [was] likely to jeopardize the continued existence of the Delta Smelt' and 'adversely modify Delta Smelt critical habitat.'" DEIS 1-7. Similarly, the 2009 NMFS BiOp declared that continued operation of the CVP and SWP would "[j]eopardize the continued existence of Sacramento River winter-run Chinook Salmon, Central Valley spring-run Chinook Salmon, Central Valley Steelhead, [and] Southern DPS of North American Green Sturgeon," and "[d]estroy or adversely modify critical habitat" for those species. DEIS 1-7. Federal, state, and local agencies are tasked with the duty to preserve these species and therefore any continued operation of the CVP and SWP must be accompanied by protection and conservation measures. NCRA 2

As the situation in the Delta becomes more dire and fish populations continue their precipitous decline, the impacts of the continued long-term operation of the CVP and SWP become more severe.[1] For example, fishing yields for Chinook salmon have seen a steep decline in recent years.[2] Indeed, the 2014 commercial catch shrunk to 151,367 Chinook from 285,592 in the previous year. *Id.* At the tail end of the 2015 commercial season, preliminary yield numbers were only 96,878 Chinook. *Id.* Recreational yields for Chinook have likewise fallen, from 112,022 Chinook in 2013 to 65,936 in 2014. *Id.* As of August 31, 2015, this year's yield so far was only 25,541 Chinook. *Id.* Protection of the Delta is paramount to the survival of these species. The RPAs identified in the BiOps help protect the Delta's many imperiled fish species *before* their populations are extirpated. The ongoing drought plaguing the state will only exacerbate these potential impacts, further highlighting the importance of implementing the No Action Alternative and subsequently *all* of the RPAs. If we fail to protect these species now, we may not have a chance in the future.

NCRA 2 continued

A. The Bureau Must Not Implement *Any* of the Action Alternatives Presented in the DEIS

None of the action alternatives considered in the DEIS can be approved. DEIS ES-7 to ES-14, 3-30 to 3-42. Three out of five action alternatives – Alternatives 1, 3, and 4 – fail to implement *any* of the RPAs identified in the BiOps and Alternative 2 only incorporates some of the RPAs. DEIS ES-11to ES-13, 3-31 to 3-40. Failing to fully implement the RPAs would not only risk entire populations of fish species, but it would also violate the Endangered Species Act, 16 U.S.C. §§ 1531 et seq. ("ESA"). Furthermore, the one action alternative that does implement all of the RPAs – Alternative 5 – is poisoned by the DEIS' attempt to sneak in an additional 32,000 acre-feet/year ("afy") water diversion. DEIS ES-14, 3-41 to 3-42. Since none of the action alternatives implement *all* of the RPAs while maintaining or lessening water diversions, Reclamation should approve the No Action Alternative.

NCRA 3

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[1] Phillip Reese and Ryan Sabalow, *Feds scramble to avoid another mass salmon die-off in the Sacramento River,* SACRAMENTO BEE (Sept. 5, 2015) (detailing some of the most recent challenges facing Chinook salmon), attached as Exhibit 1and also available at: http://www.sacbee.com/news/state/california/water-and-drought/article34197762.html#storylink=cpy

[2] Pacific Fisheries Council, Status Report for the 2015 Ocean Salmon Fisheries off Washington, Oregon and California, Supplemental Informational Report 13 (Sept. 2015), attached as Exhibit 2 and also available at: http://www.pcouncil.org/wp-content/uploads/2015/09/SUP_IR13_Salmon_Catch_Update_SEPT2015BB.pdf

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1. Failing to Fully Implement the RPAs Would Violate the ESA

As noted above, approval of Alternatives 1 through 4 would violate the Endangered Species Act, 16 U.S.C. §§ 1531 et seq. ("ESA"). The main goals of the ESA are "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such . . . species." 16 U.S.C. § 1531(b); *See also* 50 C.F.R. § 402.01. The ESA also declares that all "Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance" of these purposes. 16 U.S.C. § 1531(c). Thus Reclamation must "seek to conserve" the species that continue to be decimated by the major water diversions associated with the coordinated long-term operation of the CVP and SWP. *Id.*; 50 C.F.R. §§ 402.02; 402.14, 402.15.

The United States courts have ardently reaffirmed the importance of the ESA. The Supreme Court held in *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 180 (1978) ("*TVA*"), that the ESA "represented the most comprehensive legislation for the preservation of endangered species ever enacted by any nation," and "that Congress intended endangered species to be afforded the highest of priorities." *Id.* at 174. Indeed, the court noted that endangered species should be given "*priority over* the 'primary missions' of federal agencies." *TVA*, 437 U.S. at 185, emphasis added. If, like here, a proposed action presents a possibility of jeopardy to an endangered or threatened species or its habitat, the agency *must* consult with FWS and NMFS to create biological opinions that include RPAs to mitigate that jeopardy. 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(h).

Indeed, the ESA "affirmatively command[s] all federal agencies 'to insure that actions *authorized*, *funded*, or *carried out* by them do not jeopardize the continued existence' of an endangered species or '*result* in the destruction or modification of habitat of such species . . . .'" *TVA*, 437 U.S. at 173, *quoting* 16 U.S.C. § 1536, emphasis in original. This includes the affirmative requirement to adopt RPAs where necessary. 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(h). Agencies cannot ignore reliable information provided by FWS and NMFS in the BiOps. "Although the agency is technically not bound by findings of the . . . biological opinion[s], courts give great deference to the expertise of the FWS [and NMFS] on these issues, and an agency that attempts to proceed with an action in the face of a critical . . . biological opinion will almost certainly be found to have acted arbitrarily and capriciously and contrary to law." *Lone Rock Timber Company v. U.S. Department of the Interior*, 842 F.Supp. 433, 440 (D.Or. 1994), *citing Sierra Club v. Marsh*, 816 F.2d 1376, 1386 (9th Cir.1987) *and TVA*, 437 U.S. 153, internal citations omitted. A decision to continue long-term operation of the CVP and SWP without implementing all of the RPAs "in the face of reliable information that [it] will adversely impact protected species" violates the ESA. *Id.*

NCRA 4

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The Ninth Circuit Court of Appeals has "recognize[d] that the preparation of an EIS will not alter Reclamation's obligations under the ESA." *San Luis & Delta-Mendota Water Authority v. Jewell*, 747 F.3d 581, 653 (2014). Here, the DEIS and both BiOps state that the continued operation of the CVP and SWP *is likely to* adversely affect protected species and their habitat, and jeopardize their continued existence. DEIS 1-7. This admission alone is more than enough to trigger these agencies' duty to insure that their actions in operating the CVP and SWP do not "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species." 16 U.S.C. § 1536(a)(2), (b)(3)(A); 50 C.F.R. § 402.14(h). In order to insure that no such jeopardy is likely, the No Action Alternative should be approved and all of the RPAs identified in the BiOps should be implemented. NCRA 5

2. Alternative 5, the *Only* Action Alternative that Fully Implements the RPAs, Cannot Stand

Like the No Action Alternative, Alternative 5 would fully implement the RPAs. However, Alternative 5 also includes water contracts for the El Dorado County Water Agency ("EDCWA") and the El Dorado Irrigation District ("EID"). One of the contracts would allow EID to store up to 17,000 afy of non-CVP water in Folsom Dam; the other would provide up to 15,000 afy of CVP water to EDCWA from Folsom Dam. These contracts would result in reduced outflow from Folsom Dam rather than the greater flows needed for imperiled fish as noted above and discussed below. Neither the project's purpose and need, nor the RPAs, provide any specific justification for including these water contracts in any of the Action Alternatives. NCRA questions the decision to include these contracts in Alternative 5. NCRA 6

When compared with the No-Action Alternative, Alternative 5 would increase egg mortality for fall-run Chinook Salmon within the Sacramento and Feather River Systems during critically dry and below normal years, respectively. DEIS 9-347. The DEIS acknowledges that these effects would be more adverse than the No-Action Alternative. Therefore the No-Action Alternative must be selected.

There is an additional reason why Alternative 5 must be rejected. Its impacts are worse than those revealed in the DEIS. The DEIS should be revised to fully account for the likely increase in below normal rainfall years due to climate change. Although the DEIS does assume that climate change will increase short-duration, high-rainfall events that reduce snow-pack, and increase water temperature, it does not mention intensified drought conditions. Yet emerging research confirms that impacts associated with drought conditions – such as an increase in below NCRA 7

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normal rainfall years – are likely to increase with California's average temperature.[3] An increase in so-called below normal and critically dry years will amplify Alternative 5's detrimental effects on fall-run Chinook Salmon. For this additional reason, Alternative 5 must not be approved. NCRA 7 continued

CONCLUSION

For the reasons stated above, NCRA strongly urges adoption of the No-Action Alternative as the best hope to prevent extirpation of California's native fish. NCRA 8

Respectfully submitted,

Stephan C. Volker
Attorney for North Coast Rivers Alliance

SCV:taf

[3] *See* Williams, A. P., R. Seager, J. T. Abatzoglou, B. I. Cook, J. E. Smerdon, and E. R. Cook, (2015), Contribution of anthropogenic warming to California drought during 2012–2014, Geophys. Res. Lett., 42, 6819–6828, doi:10.1002/2015GL064924, attached as Exhibit 3(finding that human caused warming intensified drought impacts). While Appendix 5A states that CalSim II modeling examined climate change effects, the DEIS does not state that CalSim II modeling included any consideration of rising temperature's impact on drought intensity. Instead, CalSim II applies historic trends forward.

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Mr. Ben Nelson
Bureau of Reclamation, Bay-Delta Office
September 28, 2015
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Exhibit List

1. Phillip Reese and Ryan Sabalow, *Feds scramble to avoid another mass salmon die-off in the Sacramento River,* SACRAMENTO BEE (Sept. 5, 2015)

2. Pacific Fisheries Council, Status Report for the 2015 Ocean Salmon Fisheries off Washington, Oregon and California, Supplemental Informational Report 13 (Sept. 2015)

3. Williams, A. P., R. Seager, J. T. Abatzoglou, B. I. Cook, J. E. Smerdon, and E. R. Cook, (2015), Contribution of anthropogenic warming to California drought during 2012–2014, Geophys. Res. Lett., 42, 6819–6828, doi:10.1002/2015GL064924,

1D.1.12.1 Attachments to Comments from North Coast Rivers Alliance

Attachments to the North Coast Rivers Alliance Comment letter are included in Attachment 1D.4 located at the end of Appendix 1D.

1D.1.12.2 Responses to Comments from North Coast Rivers Alliance

NCRA 1: Comment noted.

NCRA 2: The conclusions of the 2008 USFWS BO and 2009 NMFS BO cited in this comment discussed conditions that would likely jeopardize the continued existence of listed species prior to implementation of the RPA actions included in each BO. The existing conditions and the future conditions under the No Action Alternative, as described in the EIS, include implementation of the RPA actions for the coordinated long-term operation of the CVP and SWP. The RPAs contained in the BOs provide actions to modify the operations in order to avoid jeopardy of listed species or adverse modifications or destruction of critical habitat.

NCRA 3: The commenter's support of the No Action Alternative is acknowledged.

The EIS analysis compares conditions under Alternatives 1 through 5 with the No Action Alternative to identify beneficial and adverse impacts for a broad range of physical, environmental, and human resources. The NEPA analysis does not determine if the alternatives would change the findings of the biological opinions in the determination of the likelihood of the alternatives to cause jeopardy to the continued existence of the species, or destroy or adversely affect their critical habitat.

NCRA 4: The commenter's opposition of Alternatives 1 through 4 is acknowledged. As discussed in the response to Comment NCRA 3, the EIS does not determine if the alternatives would be likely to cause jeopardy to the

continued existence of the species, or destroy or adversely affect their critical habitat.

NCRA 5: The comment related to the text on page 1-7 of the Draft EIS is a citation and a summary of information presented in the 2008 USFWS BO and 2009 NMFS BO. This information presented on page 1-7 of the Draft EIS is not a conclusion of the EIS.

NCRA 6: Alternative 5 was developed as part of the range of alternatives to be considered in the EIS. The commenter's opposition to Alternative 5 and support of the No Action Alternative are acknowledged.

NCRA 7: The analysis in the EIS includes a range of hydrologic conditions projected to occur with a projected 2030 level of demand and regulatory requirements (including implementation of the 2008 USFWS BO and 2009 NMFS BO. As described in Appendix 5A, Section A, CalSim II and DSM2 Modeling, of the EIS, the range of hydrologic conditions analyzed in the EIS includes severe droughts and flood periods that have occurred in a 82-year hydrology with changes for projected climate change and sea level rise. The climate change assumptions are incorporated with historical hydrologic patterns to develop projected conditions in the Year 2030 for all alternatives considered in the EIS. As indicated in the comment, the projected pattern and frequency of water year types in the Year 2030 analysis in the EIS is different than under existing conditions.

The commenter's opposition to Alternative 5 is acknowledged.

NCRA 8: The commenter's support of the No Action Alternative is acknowledged.

1D.1.13 Restore the Delta

From: **Tim Stroshane** <spillwayguy@gmail.com>
Date: Fri, Sep 18, 2015 at 2:16 PM
Subject: Request for 30-day comment period extension - OCAP
To: bcnelson@usbr.gov
Cc: Barbara Barrigan-Parrilla <barbara@restorethedelta.org>

Restore the Delta 1

I write to request a 30-day extension of the comment period on the OCAP documents.

Thank you,

Tim Stroshane
Policy Analyst
Restore the Delta

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Ben Nelson

Natural Resources Specialist

Bureau of Reclamation, Bay-Delta Office

916-414-2424

1D.1.13.1 Responses to Comments from Restore the Delta

Restore the Delta 1: At the time the request for extension of the public review period was submitted, the Amended Judgement dated September 30, 2014 issued by the United States District Court for the Eastern District of California (District Court) in the *Consolidated Delta Smelt Cases* required Reclamation to issue a Record of Decision by no later than December 1, 2015. Due to this requirement, Reclamation did not have sufficient time to extend the public review period. On October 9, 2015, the District Court granted a very short time extension to address comments received during the public review period, and requires Reclamation to issue a Record of Decision on or before January 12, 2016. This current court ordered schedule does not provide sufficient time for Reclamation to extend the public review period.

1D.1.14 South Valley Water Association

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September 29, 2015

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Attn: Ben Nelson, Natural Resources Specialist

Re: Comment on Draft EIS for the Coordinated Long-Term Operation of the Central Valley Project and State Water Project

Mr. Nelson:

The following comments are made on behalf of the South Valley Water Association ("SVWA"), an association of Friant Division Central Valley Project contractors made up of the following member irrigation and water districts: Delano-Earlimart Irrigation District, Exeter Irrigation District, Ivanhoe Irrigation District, Lower Tule River Irrigation District, Pixley Irrigation District, Shafter-Wasco Irrigation District, Stone Corral Irrigation District and Tea Pot Dome Water District. SVWA 1

The SVWA Members have direct and indirect interests in the operations of the Central Valley Project as affected by the two biological opinions ("BiOps") that are the subject of the Draft Environmental Impact Statement ("EIS") published on July 31, 2015. Consistent with those interests, we provide the following comments:

Comment 1: The public comment period should be extended.

As you are no doubt aware, the Draft EIS is an extremely voluminous document containing complicated and technical analyses. The importance and sophistication of the issues addressed in the document warrant detailed treatment, but also require a commensurate level of public analysis and review. Consequently, we respectfully request that the Bureau extend the comment period by at least thirty days. Pending your response to this request, we provide the balance of the comments while reserving the possibility of enlarging on them should the comment period be extended. SVWA 2

Comment 2: The Bureau should receive and consider comments related to its selection of a Preferred Alternative and an Environmentally Preferred Alternative SVWA 3

40 C.F.R. § 1502.14(e)[1] requires the lead agency to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement,.." Similarly, § 1502(b) requires that the Record of Decision "specify[] the alternative or alternatives which were considered to be environmentally preferable."

[1] Unless otherwise noted, all code citations refer to Title 40 of the Code of Federal Regulations.

The Bureau should, as soon as reasonably practicable, announce which Alternatives it intends to select as the Preferred Alternative and the Environmentally Preferable Alternative and why it believes those Alternatives to be superior to the others for their respective categories. Pursuant to its authority under § 1503.1(b),[2] the Bureau should then solicit comments on its tentative selections to ensure the public has an opportunity to participate in these crucial decisions. In this way, the Bureau will allow for greater public scrutiny and input, improve the quality of the ultimate decision, and provide greater transparency into the decision-making process.[3]

SVWA 3 continued

In any event, the Final EIS must include in the Executive Summary a clear and concise explanation regarding the Bureau's selection of a Preferred Alternative and the evidence used to arrive at that conclusion.[4] Further, because an EIS must "serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made,"[5] such explanation should include a discussion of the Alternatives *not* selected as the Preferred Alternative, and an explanation as to why the Bureau declined to select those Alternatives as the Preferred Alternative.

Comment 3: The Draft EIS fails to address significant and reasonably foreseeable effects on CVP contractors resulting from water deliveries to the San Joaquin River Exchange Contractors from the San Joaquin River

The Final EIS must include a discussion of the effects of the agency action and the significance of those effects.[6] Effects can be "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative."[7] "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."[8]

SVWA 4

Chapter 5 of the Draft EIS shows the changes in CVP water deliveries under the Alternatives as compared to the No Action Alternative and the Second Basis of Comparison according to CalSim II modeling results. For each comparison, the San Joaquin River Exchange

[2] § 1503.1(b) provides that "[a]n agency may request comments on a final environmental impact statement before the decision is finally made." Because the Bureau has not yet announced its selection of a Preferred Alternative, that decision will be part of the final environmental impact statement. Accordingly, this provision authorizes the Bureau to request comments on that decision before it is finally made.
[3] See § 1500.2 ("Federal agencies shall to the fullest extent possible ... encourage and facilitate public involvement in decisions which affect the quality of the human environment."); Westlands Water Dist. v. U.S. Dep't of Interior, 376 F.3d 853, 868 (9th Cir. 2004) ("The touchstone for [judicial] inquiry [into the adequacy of an EIS] is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation.").
[4] See § 1502.14(e); § 1502.1 ("Statements shall be concise, clear, and to the point, and shall be supported by evidence...").
[5] § 1502.2(g).
[6] § 1502.16(a)-(b).
[7] § 1508.8.
[8] Id.

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Contractors, which are described as a "South of Delta" contractor, are shown to experience no change in CVP water deliveries.[9]

SVWA 4 continued

The Exchange Contractors ordinarily receive water from the Delta but can, under certain circumstances, receive water from the San Joaquin River. Indeed, for the past two years, the Exchange Contractors have received less than 75% of their allotment from the Delta, with the remaining portion being diverted from the San Joaquin River. However, the model underlying the Draft EIS assumes that *all* water received by the Exchange Contractors, under all alternatives and in all water year types, will be satisfied exclusively from the Delta. This assumption simply does not comport with the reality.

When the Bureau delivers to the Exchange Contractors water from the San Joaquin River, that water is no longer available for CVP contractors who ordinarily receive their water from that source—namely the members of the SVWA, among others. As a result, these CVP contractors receive less water than they would have if the Exchange Contractors' water had been diverted exclusively from the Delta. However, because the Draft EIS assumes that all water received by the Exchange Contractors is derived exclusively from the Delta, it does not, and indeed cannot, account for the effects on the Friant Division CVP contractors when this does not occur, as it has in the past two years.

The impacts of this shortfall are significant.[10] By way of example, last year Friant Division contractors, including the SVWA members, received a zero percent contract allocation. Prior to the announcement that the Exchange Contractors would be receiving water from the San Joaquin River, the anticipated delivery to these contractors as a group was approximately a 15-20 percent Class 1 supply. Thus, as a direct result of the Exchange Contractors' receipt of water from the San Joaquin River, rather than the Delta, the Friant Division contractors experienced an extreme impact as compared to a scenario in which all of the Exchange Contractor entitlement is received from sources in the Delta. Because this shortage affects the entire Friant Division service area, constituting millions of acres of productive farm land, it is a cumulatively significant impact.[11] Moreover, in light of disputes regarding the nature of rights held by the Exchange Contractors, these impacts are highly controversial. Further, by failing to address these impacts, the Bureau may establish a precedent that they need not be considered in an EIS.[12]

The failure to first acknowledge and then analyze the impacts of the inability to satisfy all Exchange Contractor demands from Delta sources constitutes a major failing of the Draft EIS. As noted in the Bureau's own material announcing the availability of the Draft EIS for public comment, a major purpose of the current EIS process is to satisfy a directive from a federal court that it consider impacts to the human environment associated with the BiOps' implementation. As

[9] See Draft EIS, Ch. 5, Tables 5.26 (at 5-93), 5.43 (at 5-122), 5.60 (at 5-150), 5.77 (at 5-176), 5.94 (at 5-203), 5.111 (at 5-231).
[10] See § 1508.27 (reciting factors relevant to determination of significance).
[11] See § 1508.27(7)("Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by ... breaking it down into small component parts.")
[12] See § 1508.27(4)("The degree to which the effects on the quality of the human environment are likely to be highly controversial."); § 1508.27(6)("The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.").

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discussed above, the Draft EIS omits an entire area of severe impacts to the human environment that do not require any speculation or modeling because they are *actually occurring and readily quantifiable*. This renders the Draft EIS inadequate on its face. SVWA 4 continued

The reduction in water deliveries to south-of-delta contractors due to the Exchange Contractors receipt of water from the San Joaquin River is a significant effect or impact within the meaning of NEPA. Additionally, because this effect has actually occurred in each of the two preceding water years, it is a reasonably foreseeable consequence of the continued operation of the CVP. Therefore, consistent within its obligations pursuant to NEPA, the Bureau must include in the Final EIS an analysis and discussion of these effects, including a discussion of possible mitigation measures.[13]

Comment 4: Including two baselines of comparison (the No Action Alternative and the Second Basis of Comparison) undermines the EIS's fundamental purpose. The Second Basis of Comparison should be rebranded as the No Action Alternative and all discussion of the current No Action Alternative should be relocated to an appendix or removed entirely.

NEPA's purpose is to "foster excellent action … [by] help[ing] public officials make decisions that are based on understanding of environmental consequences."[14] Because "scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA,"[15] EISs must be "concise, clear, and to the point,"[16] "must concentrate on the issues that are truly significant to the action in question" and must not "amass[] needless detail."[17] Accordingly, agencies preparing an EIS are instructed to generate a document that is "*no longer than absolutely necessary* to comply with NEPA and [its] regulations."[18] Further, the document must be analytic rather than encyclopedic, written in plain language, follow a clear format, and emphasize the portions of the EIS that are useful to decision makers and the public.[19] SVWA 5

In response to comments received during the scoping process, the Bureau decided to include two bases of comparison in the Draft EIS: the No Action Alternative and the Second Basis of Comparison. While the Bureau's motives in making this decision were perhaps laudable—namely to appease critics on both sides regarding what the appropriate baseline for comparison should be—in practice, the inclusion of two baselines fundamentally impairs the Draft EIS's utility because it distracts from the core issues, effectively doubles the amount of analysis necessary to understand and comment upon the Draft EIS, and confuses the public as to what information will be considered in reaching a final decision about the continued operation of the CVP and SWP.

The inclusion of two baselines of comparison is a distraction because it forces the reader to focus on issues that are not truly significant to the environmental consequences of continued

[13] See § 1502.16(h)("[The EIS] shall include discussions of … means to mitigate adverse environmental impacts.").
[14] § 1500.1(c).
[15] § 1500.1(b).
[16] § 1500.2(b).
[17] § 1500.1(b).
[18] § 1502.2(c) (emphasis added).
[19] See § 1500.4.

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CVP/SWP operations, such as what the two baselines are designed to represent, how to effectively interpret the results of both comparisons, and to what extent each will be relied upon in reaching an ultimate decision. The Draft EIS' failure to adequately emphasize the purposes for which each baseline is useful only exacerbates this problem. SVWA 5 continued

Furthermore, including two baselines for comparison effectively doubles the amount of analysis and review necessary to understand and comment upon the document. The impacts of continued CVP/SWP operations are wide-ranging and varied. However, it is precisely for this reason that the Final EIS must be streamlined to enable that the decisionmaker to concentrate on the issues that are truly significant and not be distracted by extraneous information.

To interpret the data in the Draft EIS, the reader must compare the baseline with five alternatives across seventeen different impact categories, many of which are subdivided based on the impacts to different locations or species. The Surface Water Resources and Water Supplies category, for instance, contains eighteen different subdivisions. Further, within this category, each subdivision is divided yet again according to the six different water-year types. And, in many cases, the impacts within each water-year type are then discreetly analyzed for each month of the year where results differ. Thus, to interpret the data related to the Surface Water Resources and Water supply category, the reader must analyze nearly 6,500 data points.[20] If a second baseline for comparison is factored in, that number is doubled to nearly 13,000—and this is for only one of seventeen impact categories. Of course, these figures do not account for the fact that often times numerous data points can be addressed and considered simultaneously; however, they do illustrate to some degree the extent of the demand placed on the reader to understand and interpret the results of the Draft EIS.

The net effect of analyzing two separate bases of comparison in the substantive portions of the Draft EIS is to mask the gravity of impacts to the human environment. It does not facilitate understanding; it overwhelms the reader with an unmanageable jumble of analysis that obfuscates the issues surrounding continued CVP/SWP operations.

As the Bureau has acknowledged, it is obligated pursuant to the District Court's instruction on remand to include a "basis of comparison" similar to conditions prior to the RPAs' implementation.[21] That directive, combined with NEPA's requirements regarding the form and contents of an EIS—particularly, that it "be no longer than absolutely necessary to comply with NEPA"—mandate that the Second Basis of Comparison be rebranded as the No Action Alternative and that all discussion of the current No Action Alternative be relocated to an appendix or removed entirely. SVWA 6

Comment 5: The Preferred Alternative and the Environmentally Preferable Alternative should not be based on the 2008 BiOps.

Alternatives 2 and 5 should not be selected as the Preferred Alternative or the Environmentally Preferable Alternative because they rely on the fundamentally flawed 2008 BiOps SVWA 7

[20] 5 (alternatives) x 18 (impact category subdivisions) x 6 (water-year types) x 12 (months per year) = 6,480.
[21] See Draft EIS, at ES-8 ("The [District Court's] comments indicated that the EIS should include a 'basis of comparison' for the alternatives that was similar to conditions prior to implementation of the RPAs.").

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and would cause serious environmental and socioeconomic harm in exchange for minimal environmental benefits.

SVWA 7 continued

The 2008 BiOps are fundamentally flawed

The continued operation of CVP and SWP facilities must be based on the best available science. However, Alternatives 2 and 5 are based on scientific conclusions that we now know to be fundamentally flawed.

Rather than reiterate comments that have already been made on several occasions, we would join in comments from San Luis & Delta-Mendota Water Authority, Westlands Water District, and the Center for Environmental Science, Accuracy & Reliability as they pertain to scientific flaws and inadequacies in the 2008 BiOps, including:

- the excessive focus on X2 location as a indicator of smelt abundance;
- the insufficient focus on food availability is a driver of smelt abundance;
- the importance of considering turbidity triggers and normalized salvage in OMR flow application to reduce entrainment;
- the importance of temperature control for salmonids;
- the effects of recreational and commercial fishing on salmonids;
- the effects of ocean conditions on salmonids;
- the effects of competition from and control of hatchery fish on salmonids;
- the importance of using delta smelt life cycle models; and
- the detrimental effects of ammonia deposition on delta smelt food supply.[22]

Relative to other Alternatives, Alternatives based on the 2008 BiOps would cause serious environmental and socioeconomic harm by reducing groundwater levels and increasing groundwater extraction

Groundwater is a vital resource for California. The negative consequences associated with excessive groundwater use are well-known and numerous. Excessive groundwater extraction can cause failed wells, deteriorated water quality, environmental damage, and irreversible land subsidence that damages infrastructure and diminishes the capacity of aquifers to store water for the future.[24] In Judge Wanger's words, "[t]he potential environmental impact of groundwater overdraft is beyond reasonable dispute."[25]

SVWA 8

[22] See SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, WESTLANDS WATER DISTRICT, STATE WATER CONTRACTORS, INC., Comment 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 the State Water Project, June 28, 2012, p. 17-23; CENTRAL FOR ENVIRONMENTAL SCIENCE, ACCURACY & RELIABILITY, Comments in response to the U.S. Bureau of Reclamation Federal Register notice of March 28, 2012, requesting suggestions and information on the alternatives and topics to be addressed and any other important issues related to the EIS on the continued long-term operation of the CVP, in a coordinated manner with the SWP, June 28, 2012, p. 14-15; CENTER FOR ENVIRONMENTAL SCIENCE, ACCURACY & RELIABILITY, Letter re inadequacies of 2008 Biological Assessments, June 17, 2008.

[24] See also SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, WESTLANDS WATER DISTRICT, STATE WATER CONTRACTORS, INC., Comment re Notice of Intent and Scoping under the National Environmental Policy Act

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The enactment by the State of California in 2014 of the Sustainable Groundwater Management Act, which mandates actions to achieve sustainable groundwater management by 2034 testifies to the fundamental importance of groundwater in California and to the state's commitment to protecting this priceless resource. In enacting this historic legislation, the California Legislature declared that "[i]t is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses."[26]

Based on the results described in the Draft EIS, Alternatives 2 and 5 would not only jeopardize this vital resource in direct contravention of the express policy of the state of California,[27] they would fail to realize any countervailing benefits capable of justifying the damage that would be caused to the state's groundwater resources.

Implementation of Alternative 2 would increase groundwater extraction and reduce groundwater levels

According to the Draft EIS, the No Action Alternative and Alternative 2 would lead to identical outcomes with respect to groundwater resources.[28] Referring to the No Action Alternative, the EIS explains that "CVP and SWP water deliveries would be less in 2030 than under recent historical conditions" and "these reductions ... would result in a greater reliance on groundwater, especially during dry and critical dry years."[29] Further, according to the Bureau, "it does not appear to be reasonable and foreseeable that sustainable groundwater management would be achieved by 2030."[30] Consequently, the increased reliance on groundwater anticipated under Alternative 2 would likely lead to overdraft. Even worse, compared with the Second Basis of Comparison, Alternative 2 would increase groundwater pumping in the San Joaquin Valley by approximately 8 percent and would reduce July groundwater levels in all water-year types, ranging from up to 10 feet in central and southern San Joaquin Valley to up 200 feet in the Westside subbasin.[31] As the Draft EIS acknowledges, this reduction in groundwater levels could cause additional land subsidence.

SVWA 8 continued

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on Remanded Biological Opinions on the Coordinated Long-term Operation of the Central Valley Project and the State Water Project, June 28, 2012, Exhibit D Environmental Impacts.
[25] San Luis & Delta-Mendota Water Auth. v. Salazar, 686 F. Supp. 2d 1026, 1050 (E.D. Cal. 2009).
[26] Cal. Water Code § 113.
[27] See Draft EIS, Ch. 7, at 7-117 ("Under the No Action Alternative, it is anticipated that increased groundwater withdrawals due to reductions in CVP and SWP water supplies and reduced groundwater recharge due to climate change could result in increased irreversible land subsidence..."); Table ES.1, Comparison of Alternatives 1 through 5 to the No Action Alternative, at ES-xiii (showing that under Alternative 5 groundwater levels in all water year types would decline approximately 2 to 10 feet in most of the central and southern San Joaquin Valley and 25 to 50 feet in the Westside subbasin); ES.9 Impact Analysis, at ES-15 (indicating no changes between No Action Alternative and Alternative 2).
[28] See Draft EIS, Executive Summary, at ES-15.
[29] See Draft EIS, Ch. 7, at 7-120.
[30] Id.
[31] See Draft EIS, Executive Summary, at ESxlii-xliii.

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These results are unacceptable. By increasing reliance on groundwater, Alternative 2 would undermine the implementation of the Sustainable Groundwater Management Act and jeopardize California's ability to manage its most important natural resource in accordance with its stated policy.[32] SVWA 8 continued

Implementation of Alternative 5 would increase groundwater extraction and reduce groundwater levels

The Draft EIS found that, as compared with the No Action Alternative, which, as noted above, would increase groundwater reliance, Alternative 5 would *reduce groundwater levels in all water-year types*, ranging from as much as 10 feet in the Central and Southern San Joaquin Valley to as much as 50 feet in the Westside Subbasin.[33] Here too, the results are even worse when compared against the Second Basis of Comparison. Similar to the comparison with Alternative 2, under Alternative 5 groundwater pumping would increase by approximately 8 percent in the San Joaquin Valley. Further, July groundwater levels would decline in all water-year types, ranging from up to 10 feet in central and southern San Joaquin Valley to up to *500 feet* in the Westside Subbasin. SVWA 9

This cannot be allowed. At a time when the state's aquifers are at historic lows, any action that would have the effect of lowering the water table—thereby exacerbating a host of negative environmental, social, and economic consequences—should be endorsed, if at all, only with an extraordinary level of justification. However, as discussed below, to the extent any benefits would result from the implementation of Alternative 2 or 5, they would be insufficient to justify the immense collateral damage to the state's groundwater resources.

Implementation of Alternatives 1, 3, and 4 would reduce groundwater pumping and increase groundwater levels[34]

Unlike Alternatives 2 and 5, Alternatives 1, 3, and 4, all resulted in meaningful benefits to the state's groundwater resources. While the data suggests similar groundwater levels and pumping under Alternatives 1 and 4 in the Sacramento Valley, both Alternatives resulted in an 8% reduction in groundwater pumping in the San Joaquin Valley.[35] Further, July groundwater levels were predicted to increase in all water-year types by as much as 10 feet in Central and Southern San Joaquin Valley, up to 50 feet in the Delta-Mendota, Tulare Lake, and Kern County subbasins, and by as much as 500 feet in the Westside subbasin, where some of the most severe overdraft anywhere in the state is occurring. SVWA 10

[32] To the extent that the Draft EIS fails to address this conflict, the Final EIS must remedy that deficiency. The discussion of environmental consequences must include discussions of, inter alia, "possible conflicts between the proposed action and the objectives of .... State... policies ... for the area concerned." See § 1502.16(c); see also § 1506.2(d)("To better integrate environmental impact statements into State or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federal sanctioned). Where an inconsistency exists, the statement should describe the extent to which eh agency would reconcile its proposed action with the plan or law.).
[33] See Draft EIS, Table ES.1 Comparison of Alternatives 1 through 5 to the No Action Alternative, at ES-xiii
[34] Unless otherwise noted, all comparisons in this section are to the No Action Alternative.
[35] See Draft EIS, Table ES.1 Comparison of Alternatives 1 through 5 to the No Action Alternative, at ES-xiii

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Similarly, Alternative 3, while expected to produce similar results in the Sacramento Valley, would cause a 6% reduction in groundwater pumping in the San Joaquin Valley, with July groundwater levels in all water year types expected to increase in step with the increases under Alternatives 1 and 4 (up to 10 feet in the Central and Southern San Joaquin Valley, up to 50 feet in the Delta-Mendota, and up to 500 feet in the Westside subbasin). SVWA 10 continued

On balance, Alternatives based on the 2008 BiOps would fail to produce any meaningful benefits to fish and aquatic resources.

According to the Draft EIS, Alternative 2 would not result in any reduction of adverse effects to the species considered. In fact, the effects may become more adverse for the Steelhead and Chinook Salmon in the Sacramento River System and the Stanislaus River/Lower San Joaquin River.[37] All other effects would be similar to those under the No Action Alternative.[38] Similarly, as compared with the Second Basis of Comparison, the Draft EIS predicts that implementation of Alternative 2 would result in adverse effects for the Chinook Salmon and Steelhead and similar effects for most other species considered.[39] Only the Delta Smelt and the Longfin Smelt are predicted to experience a reduction in adverse effects within this comparison. SVWA 11

Because the only reduction in adverse effects predicted under Alternative 2 is to the Delta and Longfin Smelt, and because Alternative 2 would also increase the adverse effects to Chinook Salmon and Steelhead, there is, on balance, no meaningful benefit in terms of fish and aquatic resources. Any benefit to the Delta and Longfin Smelt is effectively negated by the increased adverse effects on Chinook Salmon and Steelhead.

Likewise, the Draft EIS predicts that implementation of Alternative 5 would not result in any reduction of adverse effects to any of the species considered, as compared with the No Action Alternative.[40] On the contrary, the only change predicted by the Draft EIS would be an increase in adverse effects for Lamprey, Hardhead, and Striped Bass in the Stanislaus and San Joaquin rivers. On the other hand, when compared against the Second Basis of Comparison, the effects of implementing Alternative 5 are largely mixed. Although potentially beneficial for some species, the effects are highly uncertain in some cases and would be accompanied by increased adverse effects for many other species. In total, the Draft EIS predicts six instances of increased adverse effects and six instances of reduced adverse effects, with the balance of effects classified as similar or uncertain.[41] Thus, as with Alternative 2, Alternative 5 would fail to produce any meaningful benefit to fish and aquatic resources. SVWA 12

[37] See id., at ES-xviii.
[38] See Draft EIS, Table ES.2 Comparison of Alternatives 1 through 5 to the Second Basis of Comparison, at ES-xlvii.
[39] See id., at ES-xliv.
[40] See Draft EIS, Table ES.1 Comparison of Alternatives 1 through 5 to the No Action Alternative, at ES-xxiii.
[41] See Draft EIS, Table ES.2 Comparison of Alternatives 1 through 5 to the Second Basis of Comparison, at ES-lii-lv (summary below).

- Trinity River Region:
  - Similar results for all species
- Sacramento River System:
  - Uncertain effects for Chinook Salmon species

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Accordingly, given the host of environmental, social, and economic consequences associated with groundwater overdraft, the effects of implementing the Alternatives based on the 2008 BiOps on fish and aquatic resources cannot justify the associated cost to California's groundwater resources. SVWA 13

Sincerely,

PELTZER & RICHARDSON, LC

Alex M. Peltzer
AMP/nc

- Increased adverse effects on 5 species: Steelhead, Green Sturgeon, White Sturgeon, Sacramento Splittail, and Pacific Lamprey
- Reduced adverse effects on 4 species: late fall-run Chinook Salmon in the Sacramento River; reduced adverse effects on the Delta Smelt, Longfin Smelt, and Black Bass
- Similar effects for 3 species: Striped Bass, American Shad, and Hardhead

- Stanislaus River/Lower San Joaquin River:
  - Similar effects for 2 species: Striped Bass and Steelhead
  - Increased adverse effects for 1 species: Reservoir fishes
  - Reduced adverse effects for 2 species: fall-run Chinook salmon and Steelhead

1D.1.14.1 Responses to Comments from South Valley Water Association

SVWA 1: Comment noted.

SVWA 2: At the time the request for extension of the public review period was submitted, the Amended Judgement dated September 30, 2014 issued by the United States District Court for the Eastern District of California (District Court) in the *Consolidated Delta Smelt Cases* required Reclamation to issue a Record of Decision by no later than December 1, 2015. Due to this requirement, Reclamation did not have sufficient time to extend the public review period. On October 9, 2015, the District Court granted a very short time extension to address

comments received during the public review period, and requires Reclamation to issue a Record of Decision on or before January 12, 2016. This current court ordered schedule does not provide sufficient time for Reclamation to extend the public review period.

SVWA 3: The Preferred Alternative is described in Section 1.5 of Chapter 1, Introduction, of the Final EIS. The Environmentally Preferred Alternative will be identified and discussed in the Record of Decision, as required by the CEQ regulations.

SVWA 4: The EIS analysis assumes all water deliveries to the San Joaquin River Exchange Contractors are conveyed through the Delta; and water deliveries from Millerton Lake would be similar under all alternatives and the Second Basis of Comparison in all water year types. However, it is recognized that during extreme droughts, water can be delivered to the San Joaquin River Exchange Contractors from Millerton Lake and CVP deliveries to users along the Friant and Madera canals can be reduced. Droughts have occurred throughout California's history, and are constantly shaping and innovating the ways in which Reclamation and DWR balance both public health standards and urban and agricultural water demands while protecting the Delta ecosystem and its inhabitants. The most notable droughts in recent history are the droughts that occurred in 1976-77, 1987-92, and the ongoing drought. More details have been included in Section 5.3.3 of Chapter 5, Surface Water Resources and Water Supplies, in the Final EIS to describe historical responses by CVP and SWP to these drought conditions, including recent deliveries of CVP water to the San Joaquin River Exchange Contractors.

SVWA 5: The comment is noted that inclusion of two basies of comparison does increase the number of alternative comparisons. The results of the impact assessment were presented separately for the alternatives as compared to the No Action Alternative and to the Second Basis of Comparison. The purposes of what the two basis of comparison represent are presented in Section 3.3 of Chapter 3, Description of Alternatives.

SVWA 6: As described in Section 3.3, Reclamation had provisionally accepted the provisions of the 2008 USFWS BO and 2009 NMFS BO, and was implementing the BOs at the time of publication of the Notice of Intent in March 2012. Under the definition of the No Action Alternative in the National Environmental Policy Act regulations (43 CFR 46.30), Reclamation's NEPA Handbook (Section 8.6), and Question 3 of the Council of Environmental Quality's Forty Most Asked Questions, the No Action Alternative could represent a future condition with "no change" from current management direction or level of management intensity, or a future "no action" conditions without implementation of the actions being evaluated in the EIS. The No Action Alternative in this EIS is consistent with the definition of "no change" from current management direction or level of management. Therefore, the RPAs were included in the No Action Alternative as Reclamation had been implementing the BOs and RPA actions, except where enjoined, as part of CVP operations for approximately three years at the time the Notice of Intent was issued (2008

USFWS BO implemented for three years and three months, 2009 NMFS BO implemented for two years and nine months).

As described in Section 3.3, Reclamation included the Second Basis of Comparison to identify changes that would occur due to actions that would not have been implemented without Reclamation's provisional acceptance of the BOs, as required by the District Court order. However, the Second Basis of Comparison is not consistent with the definition of the No Action Alternative used to develop the No Action Alternative for this EIS. Therefore, mitigation measures have not been considered for changes of alternatives as compared to the Second Basis of Comparison.

SVWA 7: The commenter's opposition to Alternatives 2 and 5 is acknowledged.

SVWA 8: The commenter's discussion of groundwater conditions under Alternative 2 as compared to the No Action Alternative and Second Basis of Comparison are consistent with the discussion of the impact analysis in Section 7.4.3.3 of Chapter Groundwater Resources and Groundwater Quality of the EIS. The commenter's opposition to Alternative 2 is acknowledged.

SVWA 9: The commenter's discussion of groundwater conditions under Alternative 5 as compared to the No Action Alternative and Second Basis of Comparison are consistent with the discussion of the impact analysis in Section 7.4.3.6 of Chapter Groundwater Resources and Groundwater Quality of the EIS. The commenter's opposition to Alternative 5 is acknowledged.

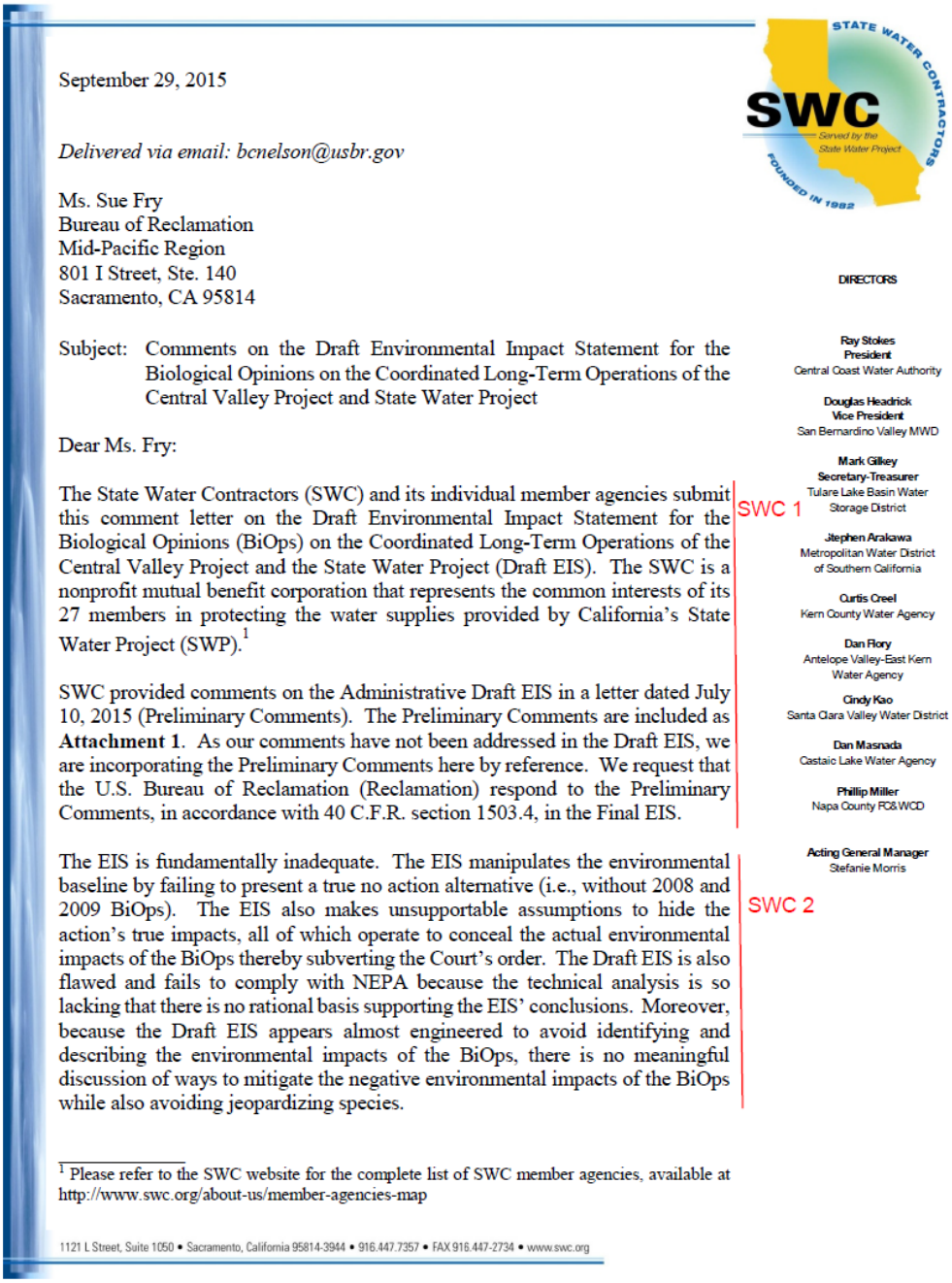
SVWA 10: The commenter's discussion of groundwater conditions under Alternatives 1, 3, and 4 as compared to the No Action Alternative and Second Basis of Comparison are consistent with the discussion of the impact analysis in Sections 7.4.3.2, 7.4.3.4, and 7.4.3.5 of Chapter Groundwater Resources and Groundwater Quality of the EIS. The commenter's support of Alternatives 1, 3, and 4 is acknowledged.

SVWA 11: The commenter's opposition of Alternative 2 is acknowledged.

SVWA 12: The commenter's opposition of Alternative 5 is acknowledged.

SVWA 13: The commenter's opposition to the No Action Alternative and Alternatives 2 and 5 is acknowledged.

1D.1.15 State Water Contractors



September 29, 2015

Delivered via email: bcnelson@usbr.gov

Ms. Sue Fry
Bureau of Reclamation
Mid-Pacific Region
801 I Street, Ste. 140
Sacramento, CA 95814

Subject: Comments on the Draft Environmental Impact Statement for the Biological Opinions on the Coordinated Long-Term Operations of the Central Valley Project and State Water Project

Dear Ms. Fry:

The State Water Contractors (SWC) and its individual member agencies submit this comment letter on the Draft Environmental Impact Statement for the Biological Opinions (BiOps) on the Coordinated Long-Term Operations of the Central Valley Project and the State Water Project (Draft EIS). The SWC is a nonprofit mutual benefit corporation that represents the common interests of its 27 members in protecting the water supplies provided by California's State Water Project (SWP).[1] SWC 1

SWC provided comments on the Administrative Draft EIS in a letter dated July 10, 2015 (Preliminary Comments). The Preliminary Comments are included as **Attachment 1**. As our comments have not been addressed in the Draft EIS, we are incorporating the Preliminary Comments here by reference. We request that the U.S. Bureau of Reclamation (Reclamation) respond to the Preliminary Comments, in accordance with 40 C.F.R. section 1503.4, in the Final EIS.

The EIS is fundamentally inadequate. The EIS manipulates the environmental baseline by failing to present a true no action alternative (i.e., without 2008 and 2009 BiOps). The EIS also makes unsupportable assumptions to hide the action's true impacts, all of which operate to conceal the actual environmental impacts of the BiOps thereby subverting the Court's order. The Draft EIS is also flawed and fails to comply with NEPA because the technical analysis is so lacking that there is no rational basis supporting the EIS' conclusions. Moreover, because the Draft EIS appears almost engineered to avoid identifying and describing the environmental impacts of the BiOps, there is no meaningful discussion of ways to mitigate the negative environmental impacts of the BiOps while also avoiding jeopardizing species. SWC 2

[1] Please refer to the SWC website for the complete list of SWC member agencies, available at http://www.swc.org/about-us/member-agencies-map

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The SWC would like to work with Reclamation to resolve these issues, as compliance with the National Environmental Policy Act (NEPA) and the Endangered Species Act are not mutually exclusive. There are feasible alternatives that can cause less impacts to water supply and agricultural resources while also avoiding jeopardy. The SWC have included as **Attachment 2** a suite of proposed actions that are a cohesive, standalone alternative to the RPAs and should have been analyzed as a separate alternative, or alternatively as mitigation measures. Some of the actions are already being implemented to some extent. SWC 3

I. THE EIS FAILS TO EVALUATE A "WITHOUT RPA" ALTERNATIVE AND/OR A "WITHOUT PROJECT" NO ACTION ALTERNATIVE AND IS THEREFORE FLAWED.

The Draft EIS is contrary to the Court's order and NEPA. The United States District Court for the Eastern District of California stated: "Reclamation's implementation of the BiOp [Biological Opinions] is a major federal action because it ***substantially alters the status quo*** in the Project's operations." Memorandum Decision Re Cross Motions for Summary Judgment of NEPA Issues, Doc. 339, at pp. 42-43, E.D. Cal. Case No. 09-407 (Nov. 13, 2009) (OCAP NEPA Decision), emphasis added. Specifically, the Court explained that the potential adverse effects including, but not limited to, loss of jobs, increased groundwater pumping, fallowing land, land subsidence, air pollution resulting from heavier reliance on groundwater pumping and a decrease in surface irrigation were in and of themselves the kind of "serious questions" about whether a project may cause significant degradation of the human environment. The Court ordered Reclamation to comply with NEPA. Order Granting and Denying Cross-Motions for Summary Judgment on NEPA Issues, at p. E.D. Cal. Case No. 09-407, at p. 2 (Dec. 2, 2009). SWC 4

The Draft EIS unlawfully circumvents the Court's order by incorporating the Reasonable and Prudent Alternatives (RPAs) that the Court ordered Reclamation to analyze relative to a no-action (no RPA) alternative under NEPA into the baseline (i.e., the no action alternative). This masks the effects of the RPAs. An EIS that is developed to cure a past violation may not rationalize or justify a decision already made by assuming that the action being validly undertaken is part of the status quo and, thus, constitutes a no-action alternative. *Pit River Tribe v. United States Forest Serv.* 469 F.3d 768, 786 (9th Cir. 2006). While the CEQ's regulations and guidance note that the No Action alternative is typically the maintenance of the status quo, the CEQ has also explained that "no action" typically means that the proposed activity would not take place. *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations,* Question 3, 46 Fed Reg. 18026 (Mar. 23, 1981). The regulations "require the analysis of the no action alternative even if the agency is under a court order or legislative command to act" and including the alternative of no action "is necessary to inform the Congress, the public, and the President as intended by NEPA." *Id*

Reclamation cannot place the RPAs in the environmental baseline and characterize these as the "no action" alternative and fulfill its Court-ordered obligation to analyze the effects of accepting the RPAs as compared to the no RPA, no-action alternative.

The use of a Second Basis of Comparison as an alternative no action baseline fails to satisfy the Court's order, in part, because the EIS does not treat the Second Basis of Comparison as a true No Action Alternative. For example, when the No Action Alternative (existing biological opinions

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baseline) is compared to the Second Basis of Comparison (no biological opinions), there is no discussion of mitigation of the effects of the biological opinions as the comparative analysis was "just for discussion purposes." (*see*, *e.g.* EIS at pp. ES-14 and 15.)

SWC 4 continued

Reclamation also failed to evaluate the RPAs' effects because neither the Second Basis of Comparison nor Alternative 1 exclude all of the regulatory requirements contained in the biological opinions. All of the RPA Actions described in section 3.3.1.2, "Actions included in the 2008 USFWS BO and 2009 NMFS BO that Would Have Occurred without Implementation of the Biological Opinions," should have been excluded from the Second Basis of Comparison and Alternative 1. There is no basis for concluding that if Reclamation and the Department of Water Resources ("DWR") were not required to implement these RPAs, Reclamation and DWR would nevertheless have the funding and the manpower to undertake the RPAs. Furthermore, evidence of progress toward implementation of the RPAs does not suggest that these actions would have been implemented if the biological opinions did not exist, rather it merely suggests that DWR and Reclamation have been working diligently to satisfy their existing regulatory obligations. Finally, because the fishery agencies felt compelled to include all of these actions as RPAs suggests that the fishery agencies did not have confidence that these actions would occur if they were not included as requirements in the biological opinions. The EIS violates the Court's order because it failed to exclude the RPAs from the without biological opinion baseline/alternative.

SWC 5

The EIS states that near-term impacts (prior to year 2030) are not addressed. (Draft EIS at p. 4-3 ["As described above, this EIS only addresses long-term operational impacts."] and p. 4-1 ["This EIS does not address interim changes that would occur between now and 2030."].) The document analyzes future conditions projected to the year 2030, based on a recognition that coordinated long-term operation of the CVP and SWP will continue to at least 2030 (p. ES-7). The analysis, however, should be focused on the impacts of implementing the RPAs and the RPA changes in the CVP and SWP operations, an action that has already started and will occur between now and 2030. The study period approach that focuses on impacts expected to occur in 2030, combined with an analysis that centers on the assumption that the no action/status quo alternative is the implementation of the RPAs, leads to flaws in the impacts analysis. The cumulative impacts analysis, for example, assumes that several projects not currently in existence will happen and will lessen or alter the impacts of implementing the RPAs. This assumption is made even though the RPAs' impacts will be felt immediately and the listed projects may not be undertaken for many years. Furthermore, many of the projects were meant to create additional supplies not to replace dwindling baseline supplies. The analysis should recognize that the RPAs, and their resulting reductions in water supplies will be occurring between now and 2030. If the short-term impacts of implementing the RPA actions were acknowledged, it would be clear that the RPA implementation will result in significant impacts.

SWC 6

Reclamation should revise and recirculate the EIS so it will comply with the Court's order to analyze the environmental consequences of changing the status quo by adopting the RPAs, in accordance with NEPA.

SWC 7

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II. THE DRAFT EIS FAILS TO ADEQUATELY ANALYZE DIRECT AND INDIRECT IMPACTS

The Draft EIS fails to adequately consider the effect of the RPAs on surface water resources, groundwater resources, agricultural resources and fishery resources. SWC 8

The CEQ regulations require that an EIS contain a "full and fair discussion" of significant environmental impacts. 40 C.F.R. § 1502.1. "The agency shall make available to the public high quality information, including accurate scientific analysis and expert agency comments, before decisions are made and actions are taken." Daniel R. Mandelker, *NEPA Law and Litigation* § 10:18 (2013 Ed.), citing 40 C.F.R. § 1500.1 (b). "To satisfy NEPA, the federal agency should consider every significant aspect of the environmental impact of a proposed action and inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Earth Island Inst. v. U.S. Forest Serv.*, 442 F.3d 1147, 1153-54 (9th Cir. 2006) (internal quotation marks and citation omitted).

As such, NEPA requires a searching and transparent investigation of the environmental consequences of federal actions. The "agency must either obtain information that is essential to a reasoned choice among alternatives, or explain why such information was too costly or difficult to obtain." *Native Village of Point Hope v. Jewell*, 2014 U.S. App. LEXIS 1150, at p. *6 (9th Cir. Jan. 22, 2014), citing 40 C.F.R. § 1502.22. If essential information is unavailable, the EIS must state that the information provided is incomplete or unavailable and the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts, summarize the existing credible evidence that is relevant, and document that the agency's evaluation is based on generally accepted methodology. 40 C.F.R. § 1502.22.

The above standards ensure that an EIS meets its primary purpose as an "action-forcing device." *See* 40 C.F.R. § 1502.1. The purpose of an EIS is to "foster both informed decision-making and informed public participation." *See State of Cal. v. Block*, 690 F.2d 753 (9th Cir. 1982). "An environmental impact statement is more than a disclosure document." 40 C.F.R. § 1502.1. "It shall be used by Federal officials in conjunction with other relevant material to plan actions and make decisions." *Ibid.*; *see also*, *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Kent Connaughton*,763 F.3d 755, 762-63 (9th Cir. 2014) ("Federal agencies must undertake a "full and fair" analysis of the environmental impacts of their activities. This is a crucial cornerstone of NEPA.").

When reviewing the adequacy of an EIS, courts demand a well-reasoned discussion. As the U.S. Supreme Court has stated, "[t]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). "In order for an agency decision to pass muster under the APA's [Administrative Procedure Act's] arbitrary and capricious test the reviewing court must determine that the decision makes sense. Only by carefully reviewing the record and satisfying [itself] that the agency has made a reasoned decision can the court ensure that agency decisions are founded on a reasoned evaluation of the relevant factors." *Dubois v. U.S. Dept. of Agriculture*, 102 F.3d 1273, 1285 (1st Cir. 1996), internal quotations omitted. The Draft EIS fails to meet NEPA's requirements.

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"Whether there may be a significant effect on the environment requires consideration of two broad factors: context and intensity. Context simply delimits the scope of the agency's action, including the interests affected. Intensity relates to the degree to which the agency action affects the locale and interests identified in the context part of the inquiry." *Native Village of Chickaloon v. Nat'l. Marine Fisheries Serv.,* 947 F.Supp.2d 1031, 1069-70 (D. Ak. 2013), internal quotations omitted. Factors relevant to the intensity of an effect include whether the effects are likely to be highly controversial. 40 C.F.R. § 1508.27, subds. (b)(4) and (b)(8). SWC 8 continued

A. The EIS failed to properly analyze the effects of the RPAs on surface water supplies.

Specific issues in the analysis and its treatment of direct and indirect impacts from water supply reductions include the following:

1. The Draft EIS improperly assumes that water suppliers will be able to meet demands without adequately analyzing the impacts of the actions that may be undertaken to satisfy this assumption.

In Chapter 5, the Draft EIS explains that under the No Action Alternative and Second Basis of Comparison, it is assumed that, on a regional scale, water demands would be met on a long-term basis and in dry and critical dry years using a combination of conservation, CVP and SWP water supplies, other imported water supplies, groundwater, recycled water, infrastructure improvements, desalination water treatment, and water transfers and exchanges. The same assumptions apply for the comparison of the No Action Alternative and Alternative 1, but there is no adequate analysis of the impacts of utilizing other imported supplies, groundwater pumping, additional infrastructure projects, desalination, or other means of satisfying demands. There is no recognition of the impacts from using these alternative supplies, or the likelihood that they can adequately mitigate the impacts of CVP and SWP reductions. SWC 9

2. The Draft EIS fails to properly analyze the impacts of the RPAs on the ability to transfer water.

The Draft EIS states that it is assumed that transfers will occur in a similar manner as have occurred for the past 10 years, while simultaneously acknowledging impacts to transfers from the limits on conveyance capacity during certain months under the RPA actions but providing no measures to mitigate this impact. There are numerous inconsistencies in the manner in which the Draft EIS discusses water transfers and the impacts of the RPA actions on the ability to undertake cross Delta water transfers. SWC 10

On Page 5-64, and elsewhere throughout the document, the Draft EIS acknowledges that the 2008 USFWS BiOp and 2009 NMFS BiOp include export restrictions that limit the use of conveyance capacity for transfers in certain months. Table 5.42 purportedly includes these reductions in the comparison of Alternative 1 and the No Action Alternative.

Elsewhere, however, the document assumes that overall impacts to water supplies will be limited because of the availability of transfer water (*see, e.g.* p. 19-57). Table 5D.50 in Appendix 5D discussing MWD's water demand and supplies includes Yuba River Accord purchases, even

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though the ability to receive these supplies has been limited in recent years. Similarly, on Page 19-79 (lines 23 – 25), in the discussion of socioeconomic impacts, the Draft EIS states that it is assumed that communities that do not have alternative water supplies would utilize water transfers. This assumption is included even though the document notes elsewhere that implementation of the RPAs will impact the ability to undertake water transfers. SWC 10 continued

While the Draft EIS includes a discussion of "effects related to cross Delta water transfers" (*e.g.*, EIS p. 5-125) and "effects related to water transfers" (*e.g.*, EIS p. 6-81) in several sections, these discussions do not analyze or disclose the impacts of limiting the ability of water suppliers to obtain alternative supplies through water transfers, particularly when these alternative supplies are necessary to mitigate the impacts on reductions in contract deliveries that are caused by the implementation of the RPAs. Instead, the discussion examines impacts to flow patterns and other factors from undertaking additional water transfers, evaluating, in cursory detail, the impacts from undertaking water transfers and citing to recent analyses in a separate NEPA document examining proposed water transfers. Reclamation should revise this analysis to focus on the impacts of limiting water transfer opportunities both as a result of restrictions on conveyance capacity and a reduction in Sacramento Valley supplies and include appropriate measures to mitigate the RPA's restrictions on water transfers.

3. **The Draft EIS fails to adequately consider the cumulative water supply effect of potentially reduced CVP-SWP supplies as water supply needs develop upstream.**

In section 5.4.2.1.2, Draft EIS p. 5-66, the analysis considers General Plan development in the Sacramento Valley, which estimates that upstream development will increase demand by 443,000 acre-feet by 2030. The reported predicted an increase in demand would include CVP contractors as well as non-water contractors. The assumption that this projected increase in demand would occur and that it would directly result in a corresponding decrease in water supply to the non-Sacramento Valley state and federal water contractors is speculative. The Draft EIS fails to evaluate whether the existing Sacramento Valley water rights includes almost a half million acre-feet of additional supply. If Sacramento Valley water use were to increase demand by nearly a half million acre-feet, without the development of additional surface storage, there would likely be an impact on other senior water rights in the Delta watershed that would need to be addressed. Conversely, if in-Delta watershed demand were to occur, then there could be a significant impact on SWP-CVP water supplies (surface and groundwater), and this impact should have been evaluated in the cumulative impact section as it would exacerbate 2030 water supply impacts resulting from the biological opinions. SWC 11

4. **The Draft EIS fails to mitigate significant water supply impacts.**

In the Executive Summary and elsewhere (*see*, *e.g.* pp ES-14 and15), the Draft EIS states that mitigation measures are not included to address adverse impacts for the alternatives as compared to the Second Basis of Comparison, because this analysis was included for informational purposes only. Prior comments have pointed out the problem with this approach. Reclamation is required to propose mitigation measures: "The mitigation measures discussed in an EIS must cover the range of impacts of the proposal . . . Once the proposal itself is considered as a whole to have significant effects, all of its specific effects on the environment (whether or not 'significant') must SWC 12

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SWC 12 continued

be considered, and mitigation measures must be developed where it is feasible to do so." CEQ, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed.Reg. 18026, Question 19 (March 23, 1981). With respect to water supply impacts, in the comparison of Alternative 1, which is identical to the Second Basis of Comparison, and the No Action Alternative, the analysis fails to fully identify the impacts of the No Action Alternative on water supply reductions relative to the Second Basis of Comparison, or to propose any mitigation for these impacts.

Draft EIS Tables 3.5 and 3.7 on pages 3-56 and 3-92, which compare the No Action Alternative and Second Basis of Comparison, disclose that long-term average annual exports would be 18 percent less under the No Action Alternative (i.e. implementation of the BiOps), and that deliveries without Article 21 water to SWP South of Delta water contractors would be reduced by 19 percent in dry years, and 22 percent in critical dry years, with deliveries of Article 21 water to SWP South of Delta contractors reduced by over 80 percent. However, the Draft EIS indicates that mitigation is not proposed for the No Action Alternative. The Draft EIS also concludes that mitigation is not necessary in Table, 3.6 (comparing Alternative 1 and the No Action Alternative) despite the same estimates of a reduction in deliveries to CVP and SWP contractors. These erroneous conclusions appear to be based on the assumption set forth in Section 5.4.2.1.3 that M&I contractors will make up for CVP and SWP supply reductions using imported water supplies, groundwater, recycled water, infrastructure improvements, desalination, and water transfers and exchanges, but simply setting forth this assumption does not satisfy the NEPA requirement to evaluate the significant effects to the human environment.

The discussion in Chapter 5 and the tables in Chapter 3 also minimize the impacts to water supplies and the related socioeconomic and other impacts by separately listing impacts in each region (*e.g.* up to 14.4 percent reductions in storage in Shasta Lake and up to 12.5 percent reduction in Lake Oroville) without discussing the cumulative or combined impact of the reductions in flows and storage levels. The overall impact of implementing the RPAs should be evaluated, with an examination of the direct and indirect impacts of implementing the RPAs and recommended mitigation to reduce the impacts.

B. The Draft EIS failed to properly analyze the effect of the RPAs on groundwater resources.

Specific issues in the analysis and its treatment of direct and indirect impacts to groundwater resources include the following:

1. The Draft EIS' position that groundwater pumping could fully mitigate reductions in surface water deliveries fails to account for existing, and the resulting future, water quality and overdraft conditions.

SWC 13

The Draft EIS acknowledges that groundwater quality and groundwater overdraft limit the agricultural sector's reliance on groundwater.[2] *See, e.g.,* Draft EIS, at pp. 12-5, 7-26, 7-34 and 7-

[2] The groundwater modeling conducted for the Draft EIS focused on reasonably foreseeable changes in groundwater quality and levels as a result of the Action. *See* Draft EIS, Appendix 7A at p. 7A-3. The results of these projections

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11. However, this admission is not reflected in the analysis as the Draft EIS fails to account for groundwater quality, subsidence and/or overdraft as limiting conditions on regional groundwater withdrawals for the agricultural sector. *See* Draft EIS at p. 12-24. The Draft EIS' conclusions are inadequately supported by the facts.

SWC 13 continued

For example, the Draft EIS states that under the No Action Alternative, it is anticipated that increased groundwater withdrawals due to reductions in CVP and SWP water supplies and reduced groundwater recharge due to climate change could result in increased irreversible land subsidence and continue to degrade water quality in portions of the Central Valley that are already characterized by low quality groundwater. Draft EIS, at p. 7-117-118. Groundwater levels under the No Action Alternative, as compared to the Second Basis of Comparison, could decline by as much as 200 feet in some years in portions of the central and southern San Joaquin Valley. Draft EIS, at p. 7-121. July average groundwater levels decline 10 to 50 feet in the Delta-Mendota, Tulare Lake, and Kern County subbasins; and 100 to over 200 feet in the Westside subbasin in all water year types. *Ibid.* In critical dry years, groundwater levels decline by up to 200 feet in the Westside subbasin. *Ibid.* These declines significantly exceed historic groundwater declines for the referenced regions and suggest that groundwater resources are not a sustainable replacement source of water for the agricultural sector. *See* Draft EIS, Chapter 7, Section 7.3.

Secondly, the Draft EIS quantifies the incremental changes in groundwater quality and levels, and resulting regional subsidence, but fails to state whether these changes would foreclose certain regions from relying on groundwater resources to offset reduced CVP and SWP deliveries. *See, generally*, Draft EIS, Chapter 7, and Section 7.4. This information is clearly essential to the analysis of each of the Alternative's effects on agricultural resources because Reclamation assumes that groundwater resources can offset the Action's effects and should be included in the Draft EIS. *See Native Village of Point Hope v. Jewell*, *supra*, 2014 U.S. App. LEXIS 1150, at p. *6 (9th Cir. Jan. 22, 2014), citing 40 C.F.R. § 1502.22.

SWC 14

The Draft EIS appears to acknowledge that historically, groundwater resources have not effectively mitigated reductions in surface water supplies. The Draft EIS provides that "[i]n extreme dry periods, such as 2014 when there were no deliveries of CVP water to San Joaquin Valley water supply agencies with CVP water service contracts, permanent crops were removed because the plants would not survive the stress of no water or saline groundwater (Fresno Bee 2014)." Draft EIS, at p. 12-10. Elsewhere, the Draft EIS states that "[d]ue to the increased frequency of water supply reductions, especially in drier years . . . the amount of fallowed and non-harvested lands has increased as a percentage of total lands within Westlands Water District. *Id.* at 12-12. The Draft EIS also states that since 2000, farmers have increased the amount of fallowed and non-harvested acres to 10 to 34 percent of the total land in the [Westlands water] district. *Id.* at 12-15. These admissions undermine Reclamation's conclusion that implementing the RPAs would have a less than significant effect on agricultural resources.

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are used in the Statewide Agricultural Production model (SWAP) to estimate the Action's long-term effects on agricultural resources. Draft EIS, Appendix 12A at pp. 12A-3, 12A-22 ("Groundwater is an alternative source to augment local surface, SWP, and CVP water delivery in all SWAP regions. The cost and availability of groundwater therefore has an important effect on how SWAP responds to changes in delivery. However, SWAP is not a groundwater model and does not include any direct way to adjust pumping lifts and unit pumping cost in response to long-run changes in pumping quantities. Economic analysis using SWAP must rely on an accompanying groundwater analysis.").

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Reclamation should revise and recirculate the Draft EIS with a discussion on whether changes in groundwater quality and levels due to increased pumping would limit the agricultural sector's reliance on groundwater as a replacement source. Alternatively, if Reclamation is unable to characterize these effects, it is required to supplement the EIS to state why the analysis cannot be feasibly conducted. SWC 14 continued

2. The Draft EIS failed to properly consider the impact of the Sustainable Groundwater Management Act.

Throughout Chapter 7, the Draft EIS makes incorrect assumptions regarding groundwater and the ability to pump groundwater as replacement water in the future. First, while the Draft EIS acknowledges the California Sustainable Groundwater Management Act (SGMA), it fails to adequately consider it. Specifically and repeatedly throughout this chapter, it assumes that there can be continued groundwater pumping. This has the effect of masking significant economic and environmental impacts. SWC 15

The Draft EIS assumes that by 2030, groundwater sustainability plans (GSPs) will not be implemented. (See 7-109). This is incorrect. The GSPs must be completed by 2020 or 2022. These GSPs will identify a sustainable yield, which will require groundwater pumping to stay within the sustainable yield. One does not reach a sustainability goal in a year. Rather, it takes infrastructure projects and potential reductions in groundwater pumping to achieve sustainability over time. For this reason, groundwater use reduction measures will have to be implemented well in advance of 2030 to meet sustainable yield by 2042.

The Draft EIS incorrectly assumes that because full compliance must be achieved by 2042, reductions in pumping will not occur before 2042. That is a blatantly faulty conclusion and is inconsistent with the SGMA. The SGMA requires DWR to review plan implementation at least once every five years to ensure that the plan is meeting the sustainability goal. (Cal. Water Code, §10733.6 ["The department shall issue an assessment for each basin for which a plan or alternative has been submitted in accordance with this chapter, with an emphasis on assessing progress in achieving the sustainability goal within the basin. The assessment may include recommended corrective actions to address any deficiencies identified by the department."].) Thus, a local agency may not simply submit a GSP and then do nothing until 2042 as this EIS suggests. To the contrary, California law requires GSP implementation to occur before 2042 and if pumping exceeds the sustainable yield, pumping must be reduced or additional supplemental sources of water must be made available to meet the demand.

Additionally, SGMA allows the State, through the State Water Resources Control Board (SWRCB) to manage a basin through a probationary plan if the Department in consultation with the SWRCB determines that a groundwater sustainability plan is inadequate or that the groundwater sustainability program is not being implemented in a manner that will likely achieve the sustainability goal. (Water Code, § 10735.2.) The SWRCB through a probationary plan, and one year after the determination that certain conditions are not met, the plan can implement certain actions, including reductions in groundwater extractions. (Water Code, § 10735.8.) This can occur after 2020 for basins designated as critically overdrafted basins and after 2022 for all other basins subject to SGMA. (Water Code § 10735.2)

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Furthermore, the Draft EIS identifies that the pumping caused by reductions in surface water supply (Alternatives 5) will cause large drops in groundwater levels which will cause increased subsidence. (Draft EIS, at p. 7-136-137.) The impacts to groundwater for other alternatives are essentially masked because the No Action Alternative includes the RPAs and thus the Draft EIS does not adequately analyze or disclose the impacts caused by each of the alternatives studied. Furthermore, in Alternative 5, which specifically shows drops of water levels as high as 200 feet per year, it assumes that SGMA would not apply. However, as indicated above, that is not correct. Since the definition of a sustainability goal includes operating within the sustainable yield, and sustainable yield is defined as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result," this requires that the basin not have undesirable results. (Water Code, § 10721 subd. (v).) Undesirable results include "chronic lowering of groundwater levels" and "significant and unreasonable land subsidence that interferes with surface land uses." (Water Code, § 10721 subd.(w).) Thus it is not acceptable to assume that with increased pumping, decreasing water levels and potential increased subsidence that pumping can continued unfettered after 2020 or 2022 depending on the basin.[3] SWC 15 continued

Reclamation's assumption in Draft EIS section 7.4 that groundwater pumping can continue unchecked is without basis. This faulty assumption renders the analysis of groundwater impacts in the Draft EIS inadequate. Reclamation is required to grapple with the realities of groundwater use and regulation in California. Notably, the list of groundwater basins that are in critical overdraft included in the Draft EIS is out of date. DWR, in accordance with the SGMA, recently updated the list of critically overdrafted basins in California. As such, we request that Reclamation include the updated list in the Final (and supplemental) EIS. SWC 16

C. The Draft EIS failed to properly analyze the effect of the RPAs on socioeconomics resulting from diminished water supplies.

Specific issues in the analysis and its treatment of direct and indirect impacts to socioeconomics include the following: SWC 17

1. The Draft EIS failed to properly analyze the effect of the RPAs on the cost and availability of urban water supplies.

Throughout the discussion of socioeconomic impacts, the analysis assumes that shortages in municipal and industrial supplies will be minimal, due to increased use of alternative supplies. By using the long-term study period time frame, the analysis fails to recognize the significant time period required to plan and construct many infrastructure improvements, as well as recycled water, desalination, and other projects. For the short-term, there is little support for the assumption that impacts from a reduction in supplies will be minimal. Recognizing that the impacts set forth in Draft EIS Tables 19.78 and 19.79 are likely greater than the assumptions, particularly over the short term, there is no support for the failure to recognize the need to mitigate impacts.

[3] The key basins analyzed are all subject to SGMA because they are designated as high or medium priority under the California Statewide Groundwater Elevation Monitoring Program (CASGEM). (Water Code, § 10720.7.)

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In Draft EIS section 19.4.3.9.1, in the final section of the socioeconomic impact discussion, the analysis apparently assumes that the future water resource management projects included in the cumulative effects analysis, including the recycled water projects, desalination projects, and groundwater storage and recovery projects listed in Chapter 3, will reduce any adverse economic impacts associated with a reduction in supplies, even though some of these projects may not be producing water for several years and some of them produce supplies at significantly increased costs, and with associated impacts which are not accounted for in the analysis. Furthermore, many of these projects are meant to support future water demands and not to supplement the reduction of existing water supplies. SWC 17 continued

2. The Draft EIS fails to analyze the short-term impacts of reductions in water demands or the impacts of using alternative supplies.

Throughout the discussion of socioeconomic impacts, the analysis assumes that shortages in municipal and industrial supplies will be minimal, due to increased use of alternative supplies. By using the long-term study period time frame, the analysis fails to recognize the significant time period required to plan and construct many infrastructure improvements, such as as recycled water, desalination, and other projects and that many projects are planned for meeting future demands not to make up for dwindling water supplies. For the short-term, there is little support for the assumption that impacts from a reduction in supplies will be minimal. Recognizing that the impacts set forth in Tables 19.78 and 19.79 are likely greater than the assumptions, particularly over the short term, there is no support for the failure to recognize the need to mitigate impacts. SWC 18

In section 19.4.3.9.1, in the final section of the socioeconomic impact discussion, the analysis apparently assumes that the future water resource management projects included in the cumulative effects analysis, including the recycled water projects, desalination projects, and groundwater storage and recovery projects listed in Chapter 3, will reduce any adverse economic impacts associated with a reduction in supplies, even though some of these projects may not be producing water for several years and some of them produce supplies at significantly increased costs, and with associated impacts which are not accounted for in the analysis.

It should be noted that a number of the projects discussed in Section 3.5 of Chapter 3 are contingent on additional analysis and future actions, and in some cases, Congressional authorization, before they can be fully implemented. This is recognized in section 1.6, where the Draft EIS states that several projects discussed as part of the cumulative effects analysis will be incorporated into a change in operations after 2030, Thus, any assumptions that these projects will reduce the socioeconomic, water quality, public health or other impacts associated with a reduction in water supplies is inappropriate. Many of these projects were meant to support future water demands and not to mitigate the reduction of existing water supplies.

3. The Draft EIS fails to properly analyze the impacts that the RPAs would have on the cost and availability of agricultural water supplies.

Reclamation concludes in the Draft EIS that implementing the RPAs and alternative RPAs would have a less than significant effect on agricultural productivity in the long-term, and in dry and SWC 19

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critical dry years. This conclusion rests entirely on Draft EIS' assumption that "[m]ost of the change in CVP and SWP irrigation supplies would be offset by changes in groundwater pumping, with only small changes in crop acreage in production." *See, e.g.*, Draft EIS at pp. 19-39,[4] 19-48, 19-53, 19-55, 19-56, 19-59, 19-64, 19-66, 19-67, 19-70, 19-77, 19-79, 19-81, 19-86, 19-88 and 19-90. The Draft EIS' conclusion is invalid because it is contradicted by the Draft EIS and is otherwise unsupported. *See* SWC Comments, *supra,* Section III (B)(1). SWC 19 continued

The Draft EIS fails to explain its conclusion that a one percent reduction in regional agricultural production from implementing the RPAs is less than significant. *See, e.g.*, Draft EIS at pp. 19-39, 12-27-59, 19-48, 19-53, 19-55, 19-56, 19-59, 19-64, 19-66, 19-67. Even less than a one percent reduction in agricultural production in the Central Valley may be significant. As is acknowledged in the Draft EIS in the introduction to socioeconomic impacts, certain locations are likely to experience severe economic impacts due to limited alternative water supplies. *See, e.g.,* Draft EIS at p. 19-39 ("Individual growers that rely on CVP and SWP supply and have no access to groundwater would have their irrigated acreage affected by larger amounts."). Nevertheless, the Draft EIS concluded that impacts were less than significant, not requiring mitigation.

D. The Draft EIS failed to properly analyze the effect of the RPAs on agricultural resources.

The Draft EIS' discussion of agricultural resources is based on the same modeling and assumptions used in the socioeconomic and water supply analyses, and most of the errors in those sections are repeated in the agricultural resources section. For example, the conclusions of "no effect" in the agricultural resources section is also based on the incorrect assumption that lost surface supplies will be replaced by groundwater, without consideration of the availability and quality of those supplies. (*See e.g.*, pp. 12-28, 12-30, 12-33, 12-43, 12-24 (SWAP model does not restrict groundwater withdrawals based on overdraft or water quality conditions).) The analysis of agricultural resources is further flawed because it fails to analyze short-term impacts to agricultural resources resulting from the implementation of the RPAs. (*See e.g.*, 12-24 (GSP discussion) and p. 12-25 (climate change would reduce available supply but effects not considered between 2008/2009 and 2030)). As a result of the Draft EIS' failure to identify impacts to agricultural resources, the Draft EIS also fails to identify potentially significant indirect effects caused by large scale land fallowing, particularly in dry years, including but not limited to impacts to air quality (dust). SWC 20

E. The Draft EIS failed to properly analyze the effect of RPAs on fishery resources.

Specific issues in the analysis and treatment of direct and indirect impacts to fishery resources include the following:

1. The Draft EIS violates the Court's order and NEPA by using the existing BiOp RPAs as the metric for evaluating the effects of the project.

[4] The Draft EIS contains significant analytical overlap between the socioeconomic and agricultural resources sections, with the socioeconomic chapter providing greater specificity as to how the analysis was conducted.

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The Draft EIS unlawfully circumvents the Court's order by using the same RPAs that the Court ordered Reclamation to analyze as the metric for measuring the environmental effects of the RPAs and alternatives. The RPAs cannot be used as the metrics for evaluating the effects of the RPAs. Examples include: SWC 21

- Delta Smelt Fall Abiotic Index: The Draft EIS uses the Fall X2 RPA to measure the biological effects of the alternatives and Second Basis of Comparison. (Draft EIS, at p. 9G-2.) This undermines the Court's order as the EIS not only fails to consider the effects of the biological opinions, but it uses the biological opinion (in this case the Fall X2 RPA) as the measure of success or failure for each of the alternatives.

  See above regarding the Draft EIS' description of Feyrer *et al*. 2011.[5] The Draft EIS at p. 9G-2 (as well as other locations) mischaracterizes what Feyrer *et al*. concluded.

- Delta Smelt OMR: The EIS uses the biological opinion's equation for estimating Delta Smelt entrainment, which is the basis for the Delta Smelt OMR RPAs. (Draft EIS, at p. 9G-2.) As further evidence of keeping to the confines of the 2008 Delta Smelt biological opinion RPAs, the EIS fails to update the biological opinion's equation with the most recent (approximately) 10-years of data. Then, each of the alternatives were compared to the estimated entrainment in the biological opinion (No Action Alternative), and deviations from the biological opinion's estimated entrainment were used to identify potentially significant impacts.

2. The Draft EIS fails to identify a scientific rationale for determinations of significance.

In Section 9.4, significance criteria are inconsistently identified. For example, there is no presentation of the approach that will be used to assess differences among alternatives for the "Analysis of Fish Passage, Predator Control Programs, and Ocean Salmon Harvest Restrictions." This is inconsistent with other mechanisms such as "Changes in Fish Entrainment and Salmonid Production" where the models used for evaluating potential effects are presented. This approach is inadequate because an EIS "shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement." 40 C.F.R. § 1502.24. SWC 22

A related, but separate, issue within the analysis of mechanisms of impact (Section 9.4), is the lack of development and application of significance criteria. (*See e.g.*, Draft EIS, at p. 9-108 [What is the logic behind the assumption that differences in monthly average flows of greater than 5% are biologically meaningful and how does that relate to the analysis of flooded habitat (Yolo Bypass)?]; *see id. at* p. 9-110 [What is the justification for assumption that differences in modeled monthly average temperatures greater than 0.5°F are biologically meaningful?]). SWC 23

Several criteria are presented in the Affected Environment Section as being biologically meaningful (e.g., a change of 1% monthly average flow of less than 0.5°F (Draft EIS p. 9-153 to

[5] Feyrer, F., Newman, K., Nobriga, M., Sommer, T. 2011. Modeling the Effects of Future Outflow on the Abiotic Habitat of an Imperiled Estuarine Fish. *Estuaries and Coasts*, published online. DOI 10.1007/s12237-010-9343-9.

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9-154).) Yet, these criteria are not applied consistently in the alternatives analysis. (*See, e.g.,* Draft EIS at p. 9-221 [Draft EIS should not have found that differences less than 0.5°F are biologically meaningful according to stated significance criteria].) Moreover, the significance terminology is undefined and inconsistently applied. Sometimes temperature differences less than 0.5°F are considered "similar" and sometimes a "slight or minor increase/decrease." SWC 23 continued

The reliance on qualitative comparisons among alternatives rather than statistical analyses makes it difficult to evaluate biologically meaningful differences between alternatives. For example, in order to truly appreciate the potential effect of an absolute difference of 1°F, it is necessary to know confidence in that value, or in other words the variation around that metric, and the probability that the difference will actually occur. Accepted professional standards would suggest that a change of 1°F with a variance of 1°F or 80% confidence would not be different than no change at all. While meaningful statistical analyses should be used to detect real difference in alternatives effect, this may not always be appropriate, particularly for model outputs. In these cases, it would be appropriate to use sensitivity analysis to determine how sensitive the model is to variation in inputs. Statistical tools are invaluable in considering multiple effects as they quantify the potential for change, remove potential for subjectivity, and minimize interpretative bias.

Related to the above comment, the conclusions made for individual mechanisms of impact throughout the alternatives analysis are difficult to evaluate due to the use of subjective qualitative comparisons. As noted, the analysis is replete with characterization of numeric relationships as "similar," "slightly," "somewhat" and/or "moderately different" yet there is no attempt to define nor numerically justify these characterizations. This leads to subjective application where in one instance a temperature of less than 0.5 °F is considered a "relatively minor temperature change," (page 9-172) but in another instance the same temperature was stated to be "slightly higher" (page 9-171). Additional confusion arises from the use of terms such as "likely to have little effect." It is not clear if such a conclusion is intended to state a "no effect" or a "likely to adversely affect" conclusion. Although not preferable to statistical analyses, qualitative comparisons can be useful where statistics are unsuitable. However, it is important to define and apply standardized criteria consistently across all comparisons, so that the same change in the environment is always considered similarly.

Although the Draft EIS contains a series of tables at the end of Chapter 9 that serve to summarize the environmental consequences and highlight differences between the alternatives, the tables are entirely narrative and laden with qualitative assessments; e.g., "unlikely to be affected," "small likelihood," "slightly lower," "generally would be slightly less," etc. Again, the end result is that the reader can't track the logic behind the assessment calls made regarding potential impacts. SWC 24

3. The Draft EIS' conclusions are not well supported by the comparison of model outputs.

Draft EIS Appendices 9J, 9L, and 9M include the results of entrainment, salvage, and passage models. These results for comparative purposes are visually depicted as box plots with no presentation of values for descriptive metrics (mean, median, standard deviation, interquartile range, etc.), nor any statistical analysis comparing the model results across alternatives. Since no analysis is provided, it is not possible to determine the usefulness of the model output to compare SWC 25

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alternatives. Distributional differences among alternatives that are described in the text are often not intuitively obvious from the box plots where median values are slightly offset and interquartile ranges show substantial overlap. *See, e.g.*, Draft EIS, at p. 9-170, Fig. 9M.1 [Unclear that any of the differences, particularly March and June are statistically different]; *id.* at p. 9-180 [Box plots in Appendix 9J (Fig. 9J) do not provide visually intuitive depictions of statistically different survival estimates]; *id.* at pp. 9-204 and Fig. 9K.5 and 9L.4, p. 9-208 and Fig. 9L.2; *id.* at p. 9-237; *id.* at Appendix 9J, Fig. 9J; *id.* at p. 9-256 and 9-285, Appendix 9L, Fig. 9L.10, Fig. 9L.1, and Fig. 9L.12; EIS p. 9-330, Appendix 9M, Fig. 9M-4. SWC 25 continued

This lack of analysis results in subjective interpretation of the data (graphs) that leads to apparent discrepancies across stocks. Examples of different interpretations from the same data/graph include hydrodynamic (pages 9-169 and 9-178; 9-178 and 9-223) and salvage (pages 9-324 and 9-327). Furthermore, it is possible that the large sample size, 81 water years, could result in statistically significant differences in predicted metrics that are not relevant to the fish population due to inherent variances, and/or model sensitivity. Therefore, some discussion of the biological significance of the predicted difference in survival at the population level is needed to adequately evaluate alternatives.

4. The Draft EIS fails to disclose scientific uncertainty and disagreements among experts.

The Draft EIS describes a body of science without acknowledging that there is significant uncertainty and disagreements between experts. SWC 26

NEPA requires disclosure of uncertainty and scientific disagreements between experts. 40 C.F.R section 1502.9(b) states: "The agency shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the agency's response to the issues raised." As explained in *Center for Biological Diversity v. United States Forest Service*, "The Service's failure to disclose and analyze opposing viewpoints violates NEPA and 40 C.F.R § 1502.9(b) of the implementing regulations." 349 F.3d. 1157, 1167 (9th Cir. 2003). Further, "…NEPA's requirement that responsible opposing viewpoints are included in the final impact statement 'reflects the paramount Congressional desire to internalize opposing viewpoints into the decision-making process to ensure that an agency is cognizant of all environmental trade-offs that are implicit to the decision'." (*Ibid.*, citing *Cal. v. Block*, 690 F. 2d. 753, 770-771 (9th Cir. 1982).

There are many examples of where the Draft EIS fails to acknowledge scientific uncertainty. This error raises significant questions regarding the validity of the Reclamation's conclusions. While the Draft EIS appropriately states at p. 9-119 that, "…the analysis attempts to identify the level of uncertainty and qualify effect conclusions where competing hypotheses may exist," the Draft EIS both fails to identify uncertainty and fails to identify the universe of scientific information that should have informed its "level of certainty" decisions. While the Draft EIS appropriately proposes a weight of evidence approach at p. 9-199, it only considers a small subset of the entire body of relevant scientific literature, thus it does not apply a weight of evidence approach.

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a) The Draft EIS fails to acknowledge the significant uncertainty associated with the factors affecting Delta Smelt distribution, particularly the role of salinity.

The Draft EIS fails to acknowledge the significant scientific uncertainty associated with the factors affecting Delta Smelt distribution. (*See e.g.*, Draft EIS, at pp. 9-64 to 9-65 and 9-115; Appendix 9B, pp. 125-126.) While Manly *et al.* (2014)[6] is mentioned, it is misconstrued. Manly *et al.* raises significant uncertainty as to whether Delta Smelt distribution is primarily influenced by salinity (position of the low salinity zone). Manly *et al.* re-evaluated Feyrer *et al.* (2011) and showed that since turbidity, salinity and geography are highly cross-correlated it is difficult to determine which, if any of these factors are most influential. Latour (2015)[7] also found that geographic location and salinity were collinear so the covariates are indistinguishable in effect. Kimmerer *et al.* (2013)[8] should also have been considered as they made a similar conclusion (p. 13): SWC 27

> The lack of consistent parallels between the availability of salinity-based habitat and abundance could have had several causes. First, our use of salinity as the only variable that defines habitat is clearly inadequate. For example, turbidity is consistently important as a covariate in analyses of delta smelt distribution (Feyrer et al, 2007; Nobriga et al. 2008). Given the difficulty in determining the controls on the delta smelt population, it is not surprising that such a simple descriptor of habitat is inadequate for this species.

The Draft EIS should also have acknowledged the issues of survey inefficiency for Delta Smelt. Bennett and Burau (2014)[9] have shown that the tidal cycle significantly influences Delta Smelt catchability in the open water where the sampling occurs. Latour (2015) identified the influence of month, region, and turbidity in determining Delta Smelt catchability. If the survey data are biased by these inefficiencies and not adjusted accordingly, then Feyrer *et al.* (as well as all other studies relying on the survey data) may not be accurately describing Delta Smelt distribution irrespective of the highly cross-correlated nature of the covariates.

Relevance: These studies are highly relevant as they raise questions as to whether salinity can be used as the sole factor defining Delta Smelt habitat, as was done in the 2008 FWS biological opinion, and whether the abiotic habitat index is an appropriate metric for evaluating potential impacts of project operations on Delta Smelt fall habitat. Draft EIS, Appendix 9-G at pp. 203. These studies also raise significant questions as to whether salinity can be used to change Delta Smelt distribution and expand the available habitat. For example, Delta Smelt might inhabit the

[6] Manly, B.F.J., Fullerton, D., Hendrix, A.N., Burnham, K.P. 2013. Comments on Feyrer *et al.* "Modeling the Effects of Future Outflow on the Abiotic Habitat of an Imperiled Estuarine Fish." Coastal and Estuarine Research Federation. Available: DOI 10.1007/s12237-014-9905-3.
[7] Latour, R. 2015. Explaining patterns of pelagic fish abundance in the Sacramento-San Joaquin Delta. *Estuaries and Coasts*. Published online. DOI 10.1007/s12237-01509968-9.
[8] Kimmerer, W.J., MacWilliams, M.L., Gross, E.S. 2013. Variation of Fish Habitat and Extent of the Low-Salinity Zone with Freshwater Flow in the San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 11(4). Available: http://scholarship.org/ic/item/3pz7x1x8.
[9] Bennett, W.A., Burau, J.R. 2014. Riders on the storm: selective tidal movements facilitate the spawning and migration of threatened Delta Smelt in the San Francisco Estuary. *Estuaries and Coasts*. pub. online. DOI 10.1007/s12237-014-9877-3.

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low salinity zone due to its proximity to productive wetland areas, or some other geographically oriented factor, irrespective of the location of the X2 isohaline. Even if the volume of the low salinity zone is a meaningful descriptor of Delta Smelt habitat, changes in the location of X2 have not been directly linked to changes in species abundance. Kimmerer *et al.* (2013) at p. 13 explains that X2, or the volume of the low salinity zone, is not a driver of Delta Smelt abundance, which calls into question the potential biological significance of any change in the location of X2 in the fall. SWC 27 continued

b) The Draft EIS improperly assumes that SWP-CVP operations have caused the location of X2 to move further upstream in the fall (September-December).

The EIS improperly uses analyses from the 2008 FWS biological opinion to conclude that there have been project-related changes in the location of X2 (September –December). Draft EIS Appendix 9G at p.2; EIS at p. 9-73. The Draft EIS should consider Hutton *et al.* (in press)[10] which shows that the full period of record demonstrates a statistically significant trend toward a more westerly (i.e. fresher) X2 location in September and no statistically significant trend in October. Hutton *et al*. further explains that the full record does reveal a statistically significant trend toward a more easterly (i.e. saltier) X2 location in November. However, there is no statistically significant difference between pre-project (water years 1922-1967) and post-project (water years 1968-2012) November X2 position in wet and above normal water years (the water year categories targeted under the current RPA). Even though there is a statistically significant easterly trend in November X2 location using the full period of record, the cause of the trend is uncertain because there are multiple diverters in the Bay-Delta watershed of a total magnitude comparable to that of the CVP-SWP. SWC 28

Relevance: A comparison of the pre-project and post-project time periods informs the question of project-related effects on outflow. The data do not support the conclusion that project operations have significantly moved X2 more easterly in September and October compared to pre-project conditions and project operations have only potentially impacted X2 location in November.

c) The Drat EIS fails to acknowledge the significant scientific uncertainty associated with the interpretation of the Longfin Smelt average Jan.-June X2: FMWT correlation.

There is a statistically significant relationship between Longfin Smelt FMWT and average January-June X2 location (Jassby *et al.* 1995,[11] Kimmerer 2004,[12] Kimmerer *et al.* 2009,[13] SWC 29

[10] Hutton, P.H., Rath, J.S., Chen, L., Ungs, M.J., Roy, S.B. (*In Review*) Nine Decades of Salinity Observations in the San Francisco Bay and Delta: Modeling and Trend Evaluation. *ASCE Journal of Water Resources Planning and Management.*

[11] Jassby, A.D., Kimmerer, W.J., Monismith, S.G., Armor, C., Cloern, J.E., Powell, T.M., Schubel, J.R., Vendlinski, T.J. 1995. Isohaline position as a habitat indicator for estuarine populations. *Ecological Applications*, 5(1), pp. 272-289.

[12] Kimmerer, W. 2004. Open water processes of the San Francisco Estuary: from physical forcing to biological responses. *San Francisco Estuary and Watershed*. 2(1).

[13] Kimmerer, W.J., Gross, E.S., MacWilliams, M.L. 2009. Is the response of estuarine nekton to freshwater flow in the San Francisco estuary explained by variation in habitat volume? *Estuarines and Coasts*, 32, p. 375-389.

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Kimmerer 2013[14]). The uncertainty and the disputes between experts are related to how that correlation should be interpreted, and whether it can reasonably be used to predict project related effects on Longfin Smelt. SWC 29 continued

The Draft EIS analysis assumes that Longfin Smelt spawn upstream of the confluence, spring outflows carry the larvae downstream for feeding, and then the species migrate out of the Delta (*i.e.*, larval transport hypothesis). *See e.g.*, Draft EIS, Appendix 9G at p. 3. Since the location of X2 (used to define the location of the low salinity (LSZ) habitat) is the only constituent of early life stage habitat being analyzed, the Draft EIS is assuming that the mechanism underlying the Longfin Smelt FMWT: January-June X2 correlation changes in the volume or location of early life stage LSZ habitat. The analysis uses the Kimmerer *et al.* (2009) correlation between Longfin Smelt FMWT: January:June X2 to predict future changes in species abundance based on changes in the location of X2 over the entire January-June averaging period. *Ibid.* The Draft EIS therefore concludes that winter and spring outflow is the largest factor driving abundance. *See e.g.*, Draft EIS, at p. 67 [also evidenced by no other flow other than outflow being evaluated in the analysis].

The Draft EIS fails to acknowledge the dispute between experts and the high degree of uncertainty, as described below:

(1) The Draft EIS fails to acknowledge that because the underlying biological mechanism is unknown, any interpretation of the Longfin Smelt FMWT correlation is uncertain.

The literature has cautioned against doing the type of analysis contained in the Draft EIS because the biological mechanism(s) explaining the Longfin Smelt abundance: winter-spring X2 correlations are largely unknown. As Kimmerer *et al.* (2002),[15] p. 1285 explained, "Predicting these responses is contingent on understanding the mechanisms underlying the flow relationships." Experts cannot reliably predict how Longfin Smelt abundance would respond to changes in reservoir releases, as compared to changes in outflow originating from (for example) wet hydrology and/or inflows to tributaries to the Bay, because the biological mechanism that would explain the observed statistical relationship is unknown. If the biological mechanism is, for example, turbidity, then increasing reservoir releases will have no effect because turbidity does not increase with reservoir releases. Kimmerer *et al.* (2002), p. 1285, explains: SWC 30

> Even for a single species, the timing and duration of flow-based management should coincide with the mechanism by which the species responds to flow. This implies knowledge of the species' mechanism. A mechanism involving an increase in brackish habitat during the rearing season (mechanism 10, Table 1) may require a long period of increased flow, and opportunities for efficiency will be limited; a mechanism involving tidal stream transport and gravitational circulation in the lower estuary (mechanism 11) may occur over a relatively brief period of larval or juvenile recruitment into the estuary.

[14] Kimmerer, W.J., MacWilliams, M.L., Gross, E.S. 2013. Variation of Fish Habitat and Extent of the Low- Salinity Zone with Freshwater Flow in the San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 11(4). Available: http://scholarship.org/ic/item/3pz7x1x8.

[15] Kimmerer, W.J. 2002. Effects of freshwater flow on abundance of estuarine organisms: physical effects or trophic linkages. Mar. Ecol. Prog. Ser., 243, pp. 39-55.

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> As a more specific example, Sacramento splittail clearly respond to increasing flow through inundation of floodplains during early spring (Sommer *et al.* 1997). This effect may occur through access to spawning habitat, in which case the period of effectiveness would be fairly brief, or rearing habitat, which would require a longer period of inundation. Distinguishing between these mechanisms and determining their importance to overall abundance of the species are important research objectives….

SWC 30

The Longfin Smelt life cycle model by Maunder *et al.* further illustrates this point (Maunder *et al.* 2015).[16] The results of that model suggest that flow may be important to species abundance, but just as Kimmerer observed above, the question is "which flow?" Hydrology, Delta outflow, X2 and inflows to the Bay from smaller tributaries are all cross-correlated. The Maunder and Deriso model selected Napa River flow, which could be used as a surrogate for Bay inflow, as being the strongest predictor of increased Longfin Smelt abundance. If the model is correct, the most effective Longfin Smelt management action may be restoration activities within the Bay's smaller tributaries or restoration of the marshes around the Bay.

Relevance: Since the biological mechanism is unknown, it cannot be assumed that X2 is directly related to Longfin Smelt abundance. It is equally possible that Longfin Smelt abundance is being driven by some other flow or environmental condition that is cross-correlated with flow. The Draft EIS should explain that the FMWT: January-June X2 correlation cannot be interpreted reliably until the underlying biological mechanism is identified.

(2) The Draft EIS improperly assumes that the biological mechanism underlying the Longfin Smelt FMWT: Jan-June X2 correlation is a change in LSZ habitat.

The Draft EIS analysis defines Longfin Smelt habitat only in terms of salinity, and equates project effects to changes in the size and location of low salinity conditions. (Draft EIS Appendix 9G, p. 3 [larval transport/LSZ habitat mechanism].) However, the literature does not support the assumption that the size and location of the winter-spring LSZ is the biological mechanism underlying the FMWT: January- June X2 correlation.

SWC 31

In the original Jassby *et al.* (1995) paper, X2 was characterized as an estuarine habitat indicator. However, that doesn't mean that the size of the LSZ is the mechanism underlying the species abundance: X2 relationships. As Kimmerer *et al.* (2013), p. 5, explained:

> …it is important to distinguish between the LSZ as a particular habitat and the numeric value of X2 as a measure of the wide variety of the physical responses of the estuary to flow (Kimmerer 2002b). In particular, abundance of various fish species may respond to X2 or its correlates through mechanisms that are not directly related to LSZ characteristics (Kimmerer 2002b, Kimmerer et al. 2009).

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[16] Maunder, M.N., Deriso, R.B., Hanson, C.H. 2014. Use of state-space population dynamics models in hypothesis testing: advantages over simple log-linear regressions for modeling survival, illustrated with application to longfin smelt (*Spirinchus thaleichthys*). Fisheries Research, 164, pp. 102-111.

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SWC 31 continued

Kimmerer *et al.* (2013), p. 15, investigated whether the size of the LSZ, rather than the numerous other non-salinity components of habitat, is the mechanism underlying the various species abundance:X2 relationships and they concluded that:

> Despite the similarity among the relationships of habitat index to X2, the abundance-X2 relationships (Kimmerer *et al*. 2009) differed greatly among the species (Fig. 8). This finding together with the lack of correspondence for some species between the habitat-X2 and abundance-X2 relationships (Fig. 8), suggest that variation in the volume (or area, not shown) of physical habitat as defined by salinity is not a strong influence on abundance of many of these fish.

See also, Reed *et al.* 2014, p. 33.[17] Longfin Smelt is one of the species where changes in the size of the LSZ habitat was considered and rejected as an explanatory mechanism. This conclusion has been confirmed on several occasions. Kimmerer *et al.* (2013), p. 14, concluded:

> Nevertheless, the observed [longfin smelt] X2-abundance relationships are inconsistent with a mechanism that involved extent of low-salinity habitat…

Kimmerer *et al.* (2009), p. 10, concluded:

> Confidence limits for relationships of abundance with X2 for longfin smelt, bay shrimp, and starry flounder did not overlap with those of any of the corresponding habitat estimates. Thus, other mechanisms are likely operating to cause these species to increase in abundance with increasing flow.

And,

> The modest slope of habitat to X2 would allow for only about a twofold variation in abundance index over that X2 range. Furthermore, the extent of the longfin smelt population in terms of distance up the axis of the estuary decreases with increasing flow. Therefore, although increases in quantity of habitat may contribute, the mechanisms chiefly responsible for the X2 relationship for longfin smelt remains unknown. It may be related to the shift by young fish toward greater depth at higher salinity, possibly implying a retention mechanism.

Kimmerer (2002), p. 1283 concluded:

> Data for striped bass and longfin smelt both fail to support a mechanism by which habitat area increase with flow.

These conclusions should not be surprising as Kimmerer, one of the Jassby *et al.* (1995) co-authors who advised caution when interpreting the longfin smelt abundance:X2 correlation. "Jassby *et al.* (1995) recognized that other factors that influence species abundance, but are not correlated with

[17] Reed, D., Hollibaugh, J., Korman, J., Peebles, E., Rose, K., Smith, P., Montagna, P. 2014. Workshop on Delta Outflows and Related Stressors Panel Summary Report. Prepared for Delta Stewardship Council, Delta Science Program.

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X2, should be considered, and cautioned against 'blind adherence' to X2 as a management tool." Reed *et al.* (2014), p. 22, citing Jassby *et al.* (1995), p. 275.

SWC 31 continued

Relevance: Since the biological mechanism is unknown, it cannot be assumed that X2 is directly related to Longfin Smelt abundance. It is equally possible that Longfin Smelt abundance is being driven by some other flow or environmental condition that is cross-correlated with flow. The Draft EIS should explain that the assumed biological mechanism of changes in the size or volume of LSZ habitat is uncertain.

(3) The Draft EIS assumes that Longfin Smelt spawn on the Sacramento River upstream of the confluence, and that flows are needed to transport larvae to Suisun Marsh and ultimately to the Bay. In so doing, the Draft EIS assumes that the biological mechanism explaining the Longfin Smelt FMWT: January-June X2 correlation is larval transport. This assumption is unsupported.

SWC 32

The Draft EIS assumes that the mechanism underlying the Longfin Smelt FMWT: January-June correlation is larval transport. Draft EIS Appendix 9G, p. 3 (larval transport/LSZ habitat mechanism). The Draft EIS also assumes that the geographic location of Longfin Smelt larvae is closely associated with the position of X2. *See, e.g.,* Draft EIS, at p. 9-67; EIS at p. 9B-138.[18] These assumptions are not supported by best available science.

There is little support for the assumption that the mechanism underlying the Longfin Smelt FMWT: January-June X2 correlation is larval transport. In fact, the fishery agencies have concluded that the mechanism underlying the Longfin Smelt correlation is unknown. For example, in its Longfin Smelt listing decision, the United States Fish and Wildlife Service acknowledged that the mechanism underlying the Longfin Smelt FMWT: January-June X2 correlation is unknown, listing larval transport as only one of several potential mechanisms. The 2012 FWS Longfin Smelt listing decision states: "Despite numerous studies of Longfin Smelt abundance and flow in the Bay Delta, the underlying causal mechanisms are still not fully understood." 77 Fed. Reg. 19,756 – 19,766 (April 2, 2012).

In several of Kimmerer's publications he also agreed that the mechanism underlying the Longfin Smelt X2 correlation is unknown. *See, e.g.,* Kimmerer *et al.* (2009), p. 11. During the 2010 SWRCB flow proceedings, Kimmerer further explained that while Longfin Smelt have a strong abundance-flow relationship, they are generally distributed at locations downstream of the LSZ, and therefore the mechanism explaining the abundance-flow relationship is likely related to conditions far outside of the LSZ Dr. Kimmerer, SWRCB, WQCP Workshop 1, Day 1, video available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/comp_review_workshops.shtml.

The Delta Regional Ecosystem Restoration Implementation Plan ("DRERIP"), which is the working conceptual model for the fishery agencies and Bay-Delta scientific community, concludes similarly at p. 9 stating:

[18] Contrary to statements in the Draft EIS at p. 9-67, a preliminary analysis of Dege and Browns 2004 data does not support the conclusion that the center of the Longfin Smelt distribution is a X2 (Grimaldo, *unpub.*).

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> The mechanism behind this relationship is not completely understood, and it is quite likely that more than one mechanism is behind the overall effect. High flows may increase available spawning habitat, increase hatching success, decrease predation on LFS larvae, increase success of larval-juvenile transformation (e.g., by increasing food sources), or some combination of these factors. Baxter (1999) and Dege and Brown (2004) observed that larval densities did not respond significantly to freshwater flow conditions. This argues against mechanisms that produce positive correlation between egg-larval increase in available spawning territories or improved egg hatching success and for mechanisms that increase success of larvae-juvenile transition….

SWC 32 continued

As explained in the DRERIP model, Longfin Smelt spawning in the upper estuary is not correlated well with outflow. In wet years, there are generally low numbers of larvae captured in the upper Estuary, a likely explanation is that Longfin Smelt descend into the San Pablo Bay to spawn (Tracy Fish Facilities Report, Vol. 38, p. 41). Longfin Smelt spawning density is higher in the upper Estuary in dry years, particularly in Suisun Bay (Tracy Fish Facilities Report, Vol. 38, p. 41). Therefore, it is unlikely that increased spawning and larvae survival in the upper estuary in high outflow years is the biological mechanism behind the Longfin Smelt abundance: X2 relationship.

There is uncertainty regarding whether the geographic location of Longfin Smelt larvae is closely associated with the position of X2. *See, e.g.*,Draft EIS, at p. 9-67; *id.* at p. 9B-138.) The analysis in the EIS also fails to account for the Longfin Smelt that spawn outside of the Delta. For Longfin Smelt spawning downstream of the Delta, larval transport from the Delta cannot be a biological mechanism explaining the correlation.

The IEP surveys do not include larval sampling in the low salinity zone areas within the tributaries to the Bay, so the existence and magnitude of spawning downstream of the confluence is unknown.[19] However, there is enough evidence to suggest that downstream spawning could be substantial, particularly in wet years. Rosenfield (2010) at p. 6 explained:

> The CDFG 20 mm survey catches relatively large numbers of LFS larvae in the Napa River estuary, especially during wet winters (CDFG 20mm Survey database), indicating that spawning habitat may be periodically available in that area as well. Finally, some maturing LFS migrate into the South Bay during the fall and winter suggesting that spawning may occur in tributaries to the South Bay (*e.g.*, Coyote Creek).

In Merz *et al.* (2013),[20] the authors mapped the distribution of larval Longfin Smelt. The maps suggest that the Delta is the eastern edge of the species range. It also suggests that longfin spawn east of the confluence.

[19] The Bay Study did perform larval surveys in the 1980s, but those surveys sampled the channels rather than the shore areas where larvae would be expected, and therefore have limited informational value.
[20] Merz, J.E., Bergman, P.S., Melgo, J.F., Hamilton, S. Longfin smelt: spatial dynamics and ontogeny in the San Francisco estuary, California. California Fish and Game, 99(3), pp. 122-148.

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There have been several limited surveys of the tributaries to the Bay, and those surveys identified Longfin Smelt larvae. In 2001 (a dry year), the Department of Fish and Wildlife ("DFW") performed the 20 mm survey in the Napa River near the City of Napa and identified densities of Longfin Smelt larvae that were an order of magnitude higher than in the Sacramento River.[21] DFW completed another survey in the Napa Estuary portion of the Napa River north of Vallejo in 2006 and again identified numbers of Longfin Smelt larvae that were an order of magnitude higher than in the Sacramento River. Delta smelt larval survey data available at ftp://ftp.delta.dfg.ca.gov/Delta%20Smelt. Stillwater Sciences, a consultant to the City of Napa, sampled in the Napa River near the City of Napa in 2001-2005, and found large densities of Longfin Smelt larvae in 2001 and 2003 (dry years). (U.S. Army Corps of Engineers, 2005).[22] In the 1980s, large numbers of Longfin Smelt larvae and juveniles were captured in the Napa River (Tracy Fish Facilities Report, Vol. 38, p. 39[23] ("Juveniles are abundant in the Napa River…. ")). The sampling during this period was in the open channel so it is possible that even higher densities would have been identified in shallows, where spawning is thought to occur. The 20 mm survey consistently catches Longfin Smelt at high densities in the Napa River between Vallejo and a few miles north of Mare Island. The 20 mm survey does not start until March, which is after spawning has begun, but it nevertheless suggests that Longfin Smelt are spawning in the area.

SWC 32 continued

The Draft EIS should have also discussed the more recent larval Longfin Smelt sampling studies, some of which were funded by Reclamation. These studies have also shown that Longfin Smelt spawning occurs in the tidal marshes surrounding Suisun Bay, and early results show Longfin Smelt larvae presence in Napa Marsh Complex, Petaluma River, Suisun Bay, and South Bay. (Grimaldo, Delta Science Conference presentation, 2014; Parker *et al.*, IEP Poster, 2014.)

The Draft EIS should explain that the scientific community generally agrees that the mechanism underlying the FMWT: January-June X2 correlation is unknown. The Draft EIS should have also acknowledged that here is compelling evidence suggesting that larval transport is not the mechanism underlying the correlation.

Relevance: Since the biological mechanism is unknown, the analysis is uncertain because it cannot be assumed that X2 is directly related to Longfin Smelt abundance. It is equally possible that Longfin Smelt abundance is being driven by some other flow or environmental condition that is cross-correlated with flow.

(4) The Draft EIS fails to acknowledge the significant uncertainty associated with Longfin Smelt abundance trends.

The Draft EIS should have discussed uncertainties created by different survey efficiencies. For example, the EIS should have acknowledged that the FMWT or the 20 mm survey only covers a small fraction of the Longfin Smelt's range. *See e.g.*, Draft EIS p. 9- 67; *id.* at p. 9B-138. The

SWC 33

[21] 20mm survey data available at ftp://ftp.delta.dfg.ca.gov/Delta%20Smelt.
[22] U.S. Army Corps of Engineers, Sacramento District. 2006. Napa River Fisheries Monitoring Program Annual Report 2005. Contract # DACW05-01-C-0015. Prepared by: Stillwater Sciences.
[23] Bureau of Reclamation. 2007. Tracy Fish Facilities Studies, spawning, early life stages, and early life histories of the Osmerids found in the Sacramento- San Joaquin Delta of California, Vol. 38.

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SWC 33 continued

Draft EIS should have also discussed Latour's 2015 findings false zeros were associated with turbidity, which suggests turbidity related survey bias.

Longfin Smelt abundance trends are uncertain, which may be a result of survey inefficiencies. For example, the mid-water trawl and the otter trawl suggest different abundance trends, with the otter trawl suggesting much less of a decline in abundance (Acuna *et al*., Delta Science Conference, 2014). Therefore, there is uncertainty as to which surveys are the more representative of species abundance trends, and whether the differences suggest significant survey bias in the fall midwater trawl.

Relevance: The reliability of the surveys is relevant to all conclusions regarding species biology and project-related effects that are based on those surveys.

d) There is significant uncertainty about the effects of the CVP-SWP on salmonids related to Delta hydrodynamics, route selection, reach specific survival, and the effects of salvage.

SWC 34

The Affected Environment of the Draft EIS, in particular section 9.3.4.12.1 (Fish in the Delta), relies heavily on fish survival and entrainment information from 2000-2009, the majority of which was collected from mark-recapture studies with coded wire tagged fish. There is an abundance of more recent data developed in the past 5 years that provides additional information on Delta hydrodynamics, route entrainment, reach specific survival and effects of salvage. For the Draft EIS, the results from a few more recent acoustic tagging studies are used for specific analyses, e.g., changes in salvage, but they are not applied broadly. In some cases, these study results have called into question the validity of using the more historic results to infer effects under more recent Delta conditions as well as the applicability of current model(s) to predict fish and flow relationships. A list of citations for relevant studies and analyses that should be incorporated into the Draft EIS are provided in the reference list below.

SWC 35

This lack of updated information is also apparent in the use of the Delta Passage Model ("DPM"). The DPM was used to evaluate baseline conditions and changes in Fish Passage and Routing (Section 9.4.1.3.4). As it is described in Appendix 9J, this model has weaknesses that call into question its utility in predicting passage differences among the Draft EIS Alternatives. The DPM should have been updated to reflect the current state of the science. Specific comments on the DPM include:

- The source documents used to develop the biological functionality of the model are too limited and result in a simplistic depiction of Delta hydrodynamics and fish biology that does not reflect current conditions. Key critical documents that address Delta hydrodynamics, fish entrainment and survival are missing including: Perry *et al.* 2015,[24]

[24] Perry, R. W., P. L. Brandes, J. R. Burau, P. T. Sandstrom, and J. R. Skalski. 2015. Effect of Tides, River Flow, and Gate Operations on Entrainment of Juvenile Salmon into the Interior Sacramento–San Joaquin River Delta. Transactions of the American Fisheries Society 144:445-455.

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SWC 35
continued

Cavallo *et al.* 2015,[25] Buchanan *et al.* 2015,[26] Delaney *et al.* 2014,[27] Zeug and Cavallo 2013,[28] SJRGA 2013,[29] Buchanan *et al.* 2013.[30]

- The DPM operates on a daily average time step using daily average flows even though this level of analysis is too course to capture flow conditions that fish experience at junctions. Cavallo *et al.* (2013)[31] suggest that the DSM2 model run at a spatial-temporal resolution of every 15 minutes is more consistent with the probability of flow and fish entrainment patterns.

- The DPM treats the Interior Delta region as a single model reach. Recent studies with acoustic tagged fish have shown significant differences in reach and junction specific hydrodynamics (Cavallo *et al.* 2015) as well as fish entrainment and survival (Delaney *et al.* 2014, Buchanan *et al.* 2013, SJRGA 2013). In addition, data from tagging studies in the downstream Delta reaches suggest that steelhead smolts are not simply moving with flows but may be utilizing selective tidal stream transport (Delaney *et al.* 2014). These data provide biological information that could be used to refine the model for the interior Delta to incorporate separate reaches or, as an alternative, conduct a sensitivity analysis of the model to evaluate its ability to predict reach-specific entrainment and survival within the Interior Delta.

- Model documentation indicates that migration speed is modeled as a function of reach specific flow for three reaches (Sac 1, Sac 2, and GEO/DCC). No information is provided as to what data informs the migration speed for the other model reaches.

- The model uses flow to inform fish behavior at junctions and assumes proportional flow for each route except for Junction C (DCC/GEO) where a non-proportional relationship, based on acoustic data, was used. No citation is provided to facilitate an evaluation of the relationship provided at Junction C nor to understand why this is the only location where a non-proportional flow relationship is used. Cavallo *et al.* (2015) suggest that fish are less likely to enter a distributary channel than would be expected based on the proportion of flow entrained there. This is consistent with the other literature that suggest that fish

[25] Cavallo, B., P. Gaskill, J. Melgo, and S. C. Zeug. 2015. Predicting juvenile Chinook Salmon routing in riverine and tidal channels of a freshwater estuary. Environmental Biology of Fishes 98:1571-1582.
[26] Buchanan, R., P. Brandes, M. Marshall, J. S. Foott, J. Ingram, D. LaPlante, T. Liedtke, and J. Israel. 2015. 2012 South Delta Chinook Salmon Survival Study: Draft report to USFWS. Ed. by P. Brandes. 139 pages.
[27] Delaney, D., P. Bergman, B. Cavallo, and J. Malgo. 2014. Stipulation Study : Steelhead Movement and Survival in the South Delta with Adaptive Management of Old and Middle River Flows.
[28] Zeug, S. C. and B. J. Cavallo. 2014. Controls on the entrainment of juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) into large water diversions and estimates of population-level loss. Plos One 9:e101479.
[29] San Joaquin River Group Authority. 2013. 2011 Annual Technical Report on Implementation and Monitoring of the San Joaquin River Agreement and the Vernalis Adaptive Management Plan (VAMP). Prepared for the California Water Resources Control Board in compliance with D-1641. Available at: http://www.sjrg.org/technicalreport/.
[30] Buchanan, R. A., J. R. Skalski, P. L. Brandes, and A. Fuller. 2013. Route Use and Survival of Juvenile Chinook Salmon through the San Joaquin River Delta. North American Journal of Fisheries Management 33:216-229.
[31] Cavallo, B., P. Gaskill, and J. Melgo. 2013. Investigating the influence of tides, inflows, and exports on sub-daily flow in the Sacramento-San Joaquin Delta. Cramer Fish Sciences Report. 64 pp. Available online at: http://www.fishsciences.net/reports/2013/Cavallo_et_al_Delta_Flow_Report.pdf .

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movement patterns are influenced by other factors including diurnal fish behavior (Delaney *et al*. 2014), tidal cycle (Perry *et al.* 2015, Cavallo *et al*. 2015, Delaney *et al.* 2014, Zeug and Cavallo 2014), velocity (Perry *et al.* 2015, SJRGA 2013, Michel *et al.* 2015)[32], and turbidity (Michel *et al*. 2015). Furthermore, Cavallo *et al*. (2015) lists seven junctions within the Interior Delta where the tidal cycle mediates any effects of inflows and exports on route selection. It seems prudent to suggest that the DPM should consider these data and the potential effects on route selection and if the model cannot be refined to incorporate some of the more recent relationships (e.g., Cavallo *et al*. 2013), then some analysis of the models sensitivity to diversion from a 1:1 fish to flow relationship is needed to evaluate the utility of the model for comparative analysis.

SWC 35 continued

- Model documentation indicates that reach specific survival is predicted using daily flow for seven reaches (Sac 1, 2, 3, 4, SS, Interior Delta via SJR, Interior Delta via OR) and exports for one reach (Interior Delta via GEO/DCC). Only the GEO/DCC and Yolo reaches are informed by means and standard deviations from survival studies. Yet, some authors have reviewed years of data and failed to demonstrate a relationship between hydrodynamics and survival (Zeug and Cavallo 2014)[33], or exports and survival (Delaney *et al*. 2014) and have suggested that there is no one hydrodynamic metric that can characterizes all patterns in the Delta. These researchers (Zeug and Cavallo 2014) as well as Michel (2010) have demonstrated that other environmental factors, independent of inflow and exports, affect salmonid survival to the ocean including select water quality parameters, temperature, and fish size.

Relevance: The failure to use up-to-date information raises significant questions about the validity and reasonableness of all conclusions related to the CVP-SWP effects on salmonid entrainment and indirect effects.

5. The Draft EIS contains numerous technical errors, including failure to cite or misapplication of scientific literature.

The Draft EIS fails to accurately describe the conclusions of many of the studies it cites. The Draft EIS also fails to properly disclose the error bars and limitations of the studies it cites. In many locations, the Draft EIS fails to provide a scientific citation to support conclusions regarding the biology of the species, which is contrary to the NEPA regulations which require, "a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment." 40 C.F.R. §1502.22. The weight of evidence approach the Draft EIS purports to apply in its decision-making is therefore significantly compromised. Examples include, but are not limited to:

SWC 36

- Kimmerer 2008: The Draft EIS uses the approach to estimating Delta Smelt entrainment adopted and incorporated into the 2008 biological opinion RPAs that is partially based on

[32] Michel, C. J., A. J. Ammann, E. D. Chapman, P. T. Sandstrom, H. E. Fish, M. J. Thomas, G. P. Singer, S. T. Lindley, A. P. Klimley, and R. B. MacFarlane. 2013. The effects of environmental factors on the migratory movement patterns of Sacramento River yearling late-fall run Chinook salmon (*Oncorhynchus tshawytscha*). Environmental Biology of Fishes 96:257-271

[33] Zeug, S. C. and B. J. Cavallo. 2014. Controls on the entrainment of juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) into large water diversions and estimates of population-level loss. Plos One 9:e101479.

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Kimmerer 2008, however the Draft EIS fails to disclose the limitations of Kimmerer's analysis. The error bars in Kimmerer 2008 are very large. In the case of Delta Smelt, the range of estimated loss was between 0-50%. Kimmerer (2008) is also based on numerous untested assumptions. For example, Miller (2014) at Table 9 identified 11 upwardly biased assumptions but was only able to correct for approximately 3 of those. The Draft EIS only references one upward bias assumption. (Draft EIS, p. 9G-2.) The Draft EIS also fails to include Kimmerer's own qualification of his work where he explains that even though his estimates of the percent of the Delta Smelt population entrained in the CVP-SWP are periodically large, there is no evidence that entrainment has had a population level effect (Kimmerer (2008) at p. 25, "… no effect of export flow on subsequent midwater trawl abundance is evident).

SWC 36 continued

- Feyrer *et al.* 2011: The Draft EIS states, "*Feyrer et al. (2011) demonstrated that Delta Smelt abiotic habitat suitability in the fall in the West Delta, Suisun Bay, and Suisun Marsh subregions, as well as smaller portion of the Cache Slough, South Delta, and North Delta subregions, is correlated with X2 location. Feyrer et al. used X2 as an indicator of the suitable salinity and water transparency for rearing older juvenile Delta Smelt.*"

  These statements are incorrect. Feyrer *et al.* showed a correlation between salinity and species presence-absence. Feyrer *et al.* did not demonstrate that habitat suitability in the fall is correlated with X2. See discussion, above, regarding scientific uncertainty of what Feyrer *et al.* did conclude.

SWC 37

- Merz *et al.* 2011[34]: The Draft EIS at p. 9B-126 states that, "*…in low outflow years, Delta Smelt occur primarily in the lower Sacramento River, with the area near Decker Island consistently exhibiting greatest catch over time. In years of very high outflow, however, their distribution extends into San Pablo Bay and the Napa River (Bennett 2000),*" and, "*They typically require low-salinity, shallow openwater habitat in the estuary (Moyle 2002).*"

  As Merz *et al.* (2011) illustrates, Delta Smelt are widely distributed in all years, with Decker Island consistently exhibiting the highest catch in all water-year types. Merz *et al.* further illustrates that Delta Smelt are caught in Suisun Marsh and Suisun Bay, which contradicts the EIS statements that Delta Smelt require low salinity shallow open water.

SWC 38

- Feyrer *et al.* 2007[35]: The Draft EIS cites Feyrer *et al.* (2007) to support the premise that when the habitat index is higher, it has a positive effect on subsequent abundance. (Draft EIS at p. 9B-129.) Kimmerer *et al.* 2013 directly contradicts Feyrer *et al.* findings as to the relationship between X2 and species abundance.

SWC 39

[34] Merz., J.E., Hamilton, S., Bergman, P.S. Cavallo, B. 2011. Spatial perspective for delta smelt: a summary of contemporary survey data. *California Fish and Game*, 97(4), pp. 164-189.
[35] Feyrer, F., Nobriga, M., Sommer, T. 2007. Multidecadal trends for three declining fish species: habitat patterns and mechanisms in the San Francisco Estuary, California. *Can. J. Aquat. Sci.* 64: 723-734.

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- Kimmerer 2011:[36] The Draft EIS at p. 9B-130 states, "*Thus, if numbers of adults or adult fecundity decline, juvenile production will also decline (Kimmerer 2011).*" However, the Draft EIS fails to state that Kimmerer's statement was theoretical. He did not show it to be true. SWC 40

- Bennett *et al.* 2008; Feyrer *et al.* 2007, 2011; Maunder and Deriso 2011[37]. The Draft EIS states at p. 9B-130 that, "*The mechanism causing carrying capacity to decline is likely due to the long-term accumulation of adverse changes in both physical and biological aspects of habitat during summer and fall (Bennett et al. 2008; Feyrer et al. 2007, 2011; Maunder and Deriso 2011.)*" The citations do not support this statement and there is no broad agreement on this point as the EIS is suggesting. SWC 41

- Baxter *et al.* 2010;[38] Feyrer *et al.* (2007, 2011): The Draft EIS states that, "*The overlap of the low salinity zone (or X2) with the Suisun Bay/Marsh is believed to lead to more favorable growth and survival conditions for Delta Smelt in the Fall. (Baxter et al. 2010; Feyrer et al. 2007, 2011).*" The citations do not support this conclusion. Baxter *et al.* is a description of a conceptual model to be tested. The Feyrer *et al.* papers do not show such a relationship. The proposed relationship is theoretical and has not been substantiated. SWC 42

- Cavallo *et al.* 2015 and Perry *et al.* 2015: The Draft EIS states at p. 9-137 that: "The DCC gate operations would be modified to reduce loss of emigrating salmonids…." However, gate closure decreases fish entering the Delta through DCC, but does not affect the overall number of fish entering Georgiana Slough (Cavallo *et al.* 2015 and Perry *et al.* 2015). SWC 43

- Newman and Brandes (2010):[39] The Draft EIS states at p. 9-137 that: "The closure of the DCC gates would increase the survival of salmonid emigrants through the Delta, and the early closures would reduce loss of fish with unique and valuable life history strategies in the spring-run Chinook Salmon and Central Valley steelhead populations." However, this statement assumes fish go with flow but data on route selection suggests it is more complicated. In addition, Newman and Brandes (2010) suggest survival through Georgiana Slough is not related to exports. SWC 44

- Delaney *et al.* 2104; Zeug and Cavallo 2013; SJRGA 2013: The Draft EIS states at p. 9-137 that: "This action suite includes actions to reduce the vulnerability of emigrating steelhead within the lower San Joaquin River to entrainment into the channels of the South Delta and at the export facilities by increasing the inflow to export ratio." However, recent SWC 45

[36] Kimmerer, W.J. 2011. Modeling Delta Smelt losses at the south Delta export facilities. San Francisco estuary and Watershed. 9(1).
[37] Maunder, M. and Deriso, R. 2011. A state-space multistage life cycle model to evaluate population impacts in the presence of density dependence illustrated with application to delta smelt (*Hyposmesus transpacifics*). *Can. J. Fish. Aquat.* Sci. 68: 1285-1306.
[38] Baxter, R., Breur, R., Brown, L., Conrad, L., Feyrer, F., Fong, S., Gehrts, K., Grimaoldo, L., Herbold, B., Hrodey, P., Mueller-Solger, A., Sommer, T., Souza, K. 2010. Interagency Ecological Program, 2010 Pelagic Organism Decline Work Plan and Synthesis of Results.
[39] Newman, K.B., Brandes, P.L. 2009. Hierarchial modeling of juveneil Chinook salmon survival as a function of Sacramento-San Joaquin delta water exports. *Northern American Journal of Fisheries Management*, 30, pp. 157-169.

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studies do not show strong effect of exports and inflows on route selection although hydrodynamics are junction specific (Delaney *et al*. 2014, Zeug and Cavallo 2013). OMR flows did not appear to affect steelhead route selection (SJRGA 2013) and Delaney *et al*. (2014) showed no relationship between arrival at facilities and exports. SWC 45 continued

- SJRGA 2013, Zeug and Cavallo 2014, Buchanan *et al*. 2015: The Draft EIS states at p. 9-138 that: "This is anticipated to increase the likelihood of survival of steelhead emigrating from the San Joaquin River. Reducing the risk of diversion into the central southern Delta waterways also could increase survival of listed salmonids…." Coded wire tagging and acoustic tagging studies show survival to be reach specific for both Chinook salmon and steelhead, with recent data indicating very little difference in survival between mainstem routes and central southern Delta routes. (SJRGA 2013, Zeug and Cavallo 2014, Buchanan *et al*. 2015). SWC 46

- Cavallo *et al*. 2015, Perry *et al*. 2015: The Draft EIS states at p. 9-152 that: "Operation of the gates can have a direct effect on the entrainment rate and hence the functioning of the Sacramento River as a migratory corridor. Without the modifications to DCC gate operations to reduce loss of emigrating salmonids and green sturgeon…." Recent data suggests that gate operations do not effectively alter entrainment rate, they just change the source and location of entrainment (Cavallo *et al*. 2015, Perry *et al*. 2015). SWC 47

- SJRGA 2013 and Zeug and Cavallo 2014: The Draft EIS states at p. 9-150 that: "Under the Second Basis for Comparison in 2030, many years will have passed without seasonal limitation on OMR reverse (negative) flow rates, with the anticipated result that fish entrainment would occur at levels comparable to recent historical conditions. Future pumping would continue to expose fish to the salvage facilities and entrainment losses into the future." However, recent data on salvage from SJRGA (2013) and Zeug and Cavallo (2014) indicates that salvage may actually be reducing losses relative to mortality occurring in SJR and elsewhere in the southern Delta. SWC 48

- Delany *et al*. 2014: The Draft EIS Appendix 9L states at p. 9L-2 that: "The entrainment analysis is applicable to spring- and winter–run Chinook Salmon even though only fall- and late-fall-run Chinook Salmon were used to construct the statistical model." While the Draft EIS' assumptions indicate that the analysis developed for spring- and winter-run Chinook salmon is also applicable for fall- and late-fall-run Chinook salmon (which is itself questionable), no acknowledgement is made about the applicability of this model for steelhead and yet it is used in the effects analysis for evaluating differences in steelhead entrainment. Delaney *et al*. (2014) suggest DSM2 may not predict steelhead movement. SWC 49

- Cavallo *et al*. 2015: The Draft EIS Appendix 9J at p. 9J-5 states: "At each junction in the model, smolts move in relation to the proportional movement of flow entering each route." But this is not a valid assumption. Cavallo *et al*. (2015), reported that at 7 of 9 junctions modeled tide was dominant influence and flow had "little effect on predicted routing of salmonids." SWC 50

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- Weighted Useable Area (WUA) analysis: The Draft EIS at pp. 9-108 to 9-109 incorporates the use of WUA as one of the metrics for making comparisons of different salmonid species and life-stages for a selected set of streams and rivers between the different alternatives. It is unclear why differences in monthly average WUA of greater than 5% between alternatives is considered biologically meaningful. The use of WUA as an indicator of overall habitat (of a particular species and life stage) within a stream under different flow conditions is at best a rough approximation of the available habitat. Additionally, the magnitude of some of the WUA estimates can exceed 1.5 million (see Table C 12-2) to more than 2 million sq. feet (see Table C-10-6). Therefore, the 5 % difference in WUA to denote a biological effect attributes greater accuracy to the calculation of WUA than what can be reasonably made, and presumes a relatively tight relationship between WUA and actual fish abundance, which is typically not the case given the suite of other factors that serve to control fish populations. Moreover, it is not clear whether and how the 5% difference was ever applied. SWC 51

  Inspection of the Draft EIS sections pertaining to impacts analysis that focused on Changes in Weighted Useable Area indicates that for the majority of cases, there would be little (< 5%) to no difference in WUA amounts for all species and life stages across all alternatives. An exception to this was noted in one instance (see page 9-176)– No Action Alternative versus Second Basis of Comparison for the Sacramento River, where a > 20% difference occurred (*see* Draft EIS, at p. 9-176). However, there is no explanation provided as to what would cause this difference and even the discussion of such was confusing – "Lesser amounts in long-term average spawning WUA during September (prior to the peak spawning period) under the No Action Alternative compared to the Second Basis of Comparison would be relatively large (more than 20 percent), with smaller decreases ….." It is unclear what is actually being stated here. Clarification is needed as to why WUA was even determined or considered as one of the metrics for comparison if overall changes in river flows do not differ or only slightly differ between alternatives?

  At the same time, the results/relationships presented in the WUA-Flow tables do not appear to be the same as those presented in the source documents. For example, fall-run WUA curves for the American River depicted in Table 9E.B.10 peak at flows around 4,500 cfs; while source document (USFWS 2003) shows peak around 2,500 cfs; likewise the steelhead curve for the lower American River in Table 9E.B.11 shows peak around 4,500 cfs whereas source document shows peak around 2,500 to 2,800 cfs. Likewise the curves depicted for the Feather River for fall-run Chinook and steelhead spawning (Tables 9E.B.8 and 9) do not appear to correspond with those in the source documents (CDWR 2004); fall-run Chinook peak at 7,500 cfs in Table 9E.B.11 but around 2,000 cfs in source document (see Table 5.5-2); steelhead peak at 5,000 cfs in Table 9E.B.9 but around 1,000 cfs in the source document. The appendix needs to explain these differences.

- Lack of scientific citation: The document improperly cites policy documents and agency documents describing untested conceptual models and uses them to support important conclusions regarding entrainment risk (*i.e.*, California Resources Agency 2000 and Baxter *et al.* 2008). Draft EIS, at p. 9B-130. Examples of lack of scientific citation include but are not limited to: SWC 52

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