Page 2-9. Table 2-2. Table 2-2 describes the NEPA/CEQA level of compliance for actions included under the action alternatives. Several common restoration actions are identified. Essentially, none of these restoration actions are discussed or alternatives considered, with the exception of the conveyance capacity in Reach 4B and the use of the bypasses. For example:

a. What environmental issues are raised by the modification of the San Joaquin River Headgate Structure to enable fish passage and flow routing?

b. Modification of the Sand Slough Control Structure and the screening of the Arroyo Canal and the provision of fish passage at Sack Dam has been modified over the course of the development of the program. The current plans for Sack Dam and the Arroyo Canal have escalated from initial considerations. Where is the discussion of these changes and alternatives?

c. Where is the discussion for modification of the Eastside and Mariposa Bypasses to either use those bypasses in their current condition, create low flow channels within them, create low flow channels adjacent to them, control the vegetation within the canals if they are used for fish passage, and other issues raised by the use of these bypasses for non-flood purposes?

EC1-52

d. There is no discussion regarding the deployment of seasonal barriers at Mud and Salt Sloughs.

e. There is no discussion regarding the modification of the Chowchilla Bypass Bifurcation Structure.

f. There is no discussion regarding the filling or isolating of gravel pits and the alternatives available. For instance, when will they be filled, where will the material be taken to fill them, what issues are raised by river disruption associated with such fill, how will filling these gravel pits while spring-run Chinook salmon are already in the river affect the fishery, what mitigation measures will be taken to avoid impacts on the fishery, etc.

g. There is no discussion of the issues associated with the enhancing of spawning gravel. Will injection methods be used? Mechanical means? Where might the gravel come from? Since fish will already be in the river, how often will gravel be reintroduced? Under what conditions?

h. Another common action is to reduce the potential for redd superimposition and/or hybridization. Is Reclamation proposing some sort of separation weir, other method? Is it expected that fall-run and spring-run will naturally stay separate? Given that fish may be taken from the Feather River where hybridization has already occurred, this could be a major problem. (*See* comments to Chapter 5).

i. Another common action is the modification of flood plain and side-channel habitat. Where will this habitat be located? How many miles or acres of flood plain will be created? Will there be levees or dikes? Will additional vegetation be required? Will land be taken out

EC1-52 cont'd — of production? What are the implications of creating additional flood plain habitat to flow and seepage impacts? Will additional levees and slurry walls be necessary?

EC1-53 — Page 2-9. Table 2-2. Need to carefully address all flow related issues in the Draft PEIS/R comments because the level of NEPA/CEQA compliance is at the project level, therefore we will not have another chance to comment as part of the NEPA/CEQA process.

EC1-54 — Page 2-9. Table 2-2. Need to carefully address all flood risk related issues in the Draft PEIS comments because the level of NEPA/CEQA compliance is at the project level, therefore we will not have another chance to comment as part of the NEPA/CEQA process.

EC1-55 — Page 2-9. Table 2-2. Need to carefully address all downstream flow control structure related issues in the PEIS comments because the level of NEPA/CEQA compliance is at the project level, therefore we will not have another chance to comment as part of the NEPA/CEQA process.

EC1-56 — Page 2-11. Line 1. Section 2.3 discusses the no-action and no-project alternatives for NEPA and CEQA purposes. The no-action alternative includes facilities, conditions, land uses and reasonably foreseeable actions expected to occur in the study area by 2030. Why was 2030 chosen as the target date? The Settlement essentially concludes in 2025 unless extended by the court. The use of a 2030 date seems arbitrary.

EC1-57 — Page 2-11. Line 22. The Draft PEIS/R states that additional simulation is being prepared to assess projected conditions under the no-action alternative with implementation of the USFWS 2008 Biological Opinion ("BO") on the coordinated operations of the CVP and SWP and the 2009 NMFS Final Biological and Conference Opinion on the long-term operations of the CVP and SWP. It further states that results of these assessments will change the anticipated effects of the no-action alternative, but are not anticipated to change the results of the assessment. It further states that the assessment will be provided in the final PEIS/R. If the results of the assessment are only provided in the final PEIS/R and do change the results of the assessment, is Reclamation intending to issue a supplemental PEIS/R to afford the public an opportunity to comment?

EC1-58 — Page 2-12. Line 1. Table 2-3 identifies projects included under the no-action alternative. While various Delta-related projects are included, there is no discussion of the Bay Delta Conservation Plan.

EC1-59 — Page 2-14. Line 1. Section 2.4 discusses alternative A1 at both the project and program level. Given that the common actions described in Table 2-2 are included, each of those actions must also be discussed at the project and program level. This discussion is missing from the Draft PEIS/R. (*See* subsequent comments).

EC1-60 — Page 2-14. Line 17. Reoperation of Friant Dam and downstream control structures is identified as one of the key actions. Various actions are included under this general action.

a. A specified action is the releasing of Interim and Restoration Flows from Friant Dam "up to the Restoration Flows stipulated by the Settlement, as constrained by then-existing channel capacities". In addition to constraints associated with then-existing channel capacities,

EC1-60 cont'd

additional constraints will include limitations imposed by the State Water Resources Control Board ("Water Board") and by the Seepage Monitoring and Management Plan. The Draft PEIS/R should discuss existing permit conditions required by the Water Board associated with Interim Flows and should assume that those conditions, at an absolute minimum, will be included in any long-term permit. A copy of the most recent conditions is included with these comments.

EC1-61

b. Since the action includes the release of flows at amounts less than the Restoration Flows, the Draft PEIS/R should discuss the impacts on achieving the restoration goal if the program is limited, for example, to the existing flows as of the time that the Draft PEIS/R was issued. Flows below Sack Dam are limited to 50 cfs and above Mendota Pool to 1,300 cfs. Can the program be implemented on a permanent basis using these flow levels? How much greater would flows have to be in order to minimally move fish up and down the river or provide sufficient habitat to maintain the fish?

EC1-62

c. At line 23, the Draft PEIS/R indicates that minimizing increases in flood risk in the restoration area is necessary. Flooding occurred in WY 2011 at flows of 3,000 cfs. Yet, the hydrograph in the Settlement calls for flows as high as 4,500 cfs. How will flooding be avoided when flows are increased 50% over the flows that caused flooding this year?

EC1-63

d. There is no discussion of the Seepage Management Plan that will be necessary for any flow releases. The elements of the SMP should be discussed at the program level.

EC1-64

Page 2-14. Line 23. Text states the action is "Minimizing increases in flood risk in the Restoration Area as a result of Interim and Restoration flows". Action should be "No increase in flood risk as a result of Interim and Restoration flows."

EC1-65

Page 2-15. Line 8. Recaptured water for transfer to the Friant Division may range from 0 to 556,000 acre feet. If recapture is 0 acre feet or amounts not substantially greater than that, what long-term impacts will there be on the Friant Division?

EC1-66

Page 2-17. Line 1. Table 2-4 shows the estimated maximum water available for transfer under the different action alternatives. It shows a total available for transfer of 556,000 acre feet, and includes an additional 67 acre feet if potential buffer flows are included, for a maximum total of 623,000 acre feet. The recapture of either 556,000 acre feet or 623,000 acre feet is not realistic. There is no capacity at the Mendota Pool or the Delta to recapture this amount of water. There is no description of a pumping plant that would have this type of capacity. NEPA requires that a realistic analysis be conducted, not a theoretical analysis. Using artificially high numbers for recapture provides the false impression of decreasing impacts to Friant.

EC1-67

Page 2-20. Line 1. Table 2-5 contains a schedule for the release of Interim and Restoration Flows. Footnote 1 discusses the release of Interim Flows during WY 2010 and WY 2011. It should also discuss the limitations imposed on those flows by the Water Board. Footnote 2 indicates that the release of water to wet the channel down to the Chowchilla Bypass Bifurcation Structure is intended to correspond to construction activities in paragraph 11(a). Footnote 2 states that "Actual time period of these releases would be coincident with these activities." Given the lack of funding, the release of water to wet the channel down to

EC1-67 cont'd

the Chowchilla Bypass Bifurcation Structure will not occur May 1 – December 1, 2011 – 2012 as the construction activities in paragraph 11(a) will not have commenced. There is no discussion of lack of funding regarding the facilities specified in paragraph 11(a). Similarly, at page 2-20, line 5, it states that full Restoration Flows are anticipated to begin January 1, 2014, as constrained by then-existing channel capacities. The text should indicate that the flows will be constrained by channel capacities and limitations imposed by the Water Board and the Seepage Management Plan.

EC1-68

Page 2-21. Line 10. The Draft PEIS/R states that "Several federal and state actions, including channel capacity modifications, *are necessary before full Restoration Flows are released*." (emphasis added) Exactly which federal and state actions are necessary before full Restoration Flows are released? Since this Draft PEIS/R looks at flows at a project level, the referred-to state and federal actions must all be set forth at a minimum at a programmatic level in the Draft PEIS/R. Similarly, the channel capacity modifications must also be identified and analyzed.

EC1-69

Page 2-21. Line 36. The Draft PEIS/R states that if for any reason full Restoration Flows are not released in any year beginning 2014, the Secretary may release water from Friant Dam during times of year other than those specified in the applicable flow schedule. What would be the purpose for the release of these flows? Since they are not tailored to provide habitat for fisheries, the release of flows merely for flow purposes would be a waste of water. The purpose of this program is to restore the San Joaquin River for fisheries, not to simply create a wetted channel. If the objective were to create a wetted channel, a warm water fishery could be reestablished at a substantially lower cost and impact.

EC1-70

Page 2-22. Line 14. The Draft PEIS/R states "If Reclamation makes deliveries to the San Joaquin River Exchange Contractors via the San Joaquin River, these water deliveries would have a higher priority for channel capacity over Interim or Restoration Flows. Therefore, Interim and Restoration Flows would be reduced, as necessary, to provide channel capacity for water delivery to the San Joaquin River Exchange Contractors via the San Joaquin River." We are pleased to see that Reclamation recognizes its responsibility to meet the terms of the exchange contract. It is unclear, however, why the water that travels from Friant Dam to the Mendota Pool cannot serve dual purposes. Certainly, this water will be useful for providing fish habitat during that period of time. To the extent that water reaches the Mendota Pool, it could be serving restoration goal purposes. It makes no sense to release additional flows not otherwise necessary for restoration purposes if water has already been released down the river.

EC1-71

Page 2-22. Line 21. Apparently, Article 3(n) of the Friant Division long-term water service contracts and the recently executed Friant Division repayment contracts provide as follows:

> a. The United States agrees that it will not deliver to the Exchange Contractors thereunder waters of the San Joaquin River unless and until required by the terms of said contract, and the United States further agrees that it will not voluntarily and knowingly determine itself unable to deliver to the Exchange Contractors entitled thereto from water that is available or that may become available to it from the San Joaquin River and its tributaries or the Sacramento-San Joaquin Delta those quantities required to satisfy the obligation of the United States under said exchange contract and under Schedule 2 of the Contract for Purchase of Miller and Lux Water Rights (Contract 11r-1145, dated July 27, 1939).

EC1-71 cont'd — It is unclear by this clause as to whether Reclamation is agreeing that it will not deliver water down the San Joaquin River for diversion at the Mendota Pool for the benefit of the Exchange Contractors to create a credit in San Luis Reservoir for the benefit of the Friant Division. It appears that recapture at the Mendota Pool is one of the possibilities for providing water to the Friant Division. If recapture is permitted at the Mendota Pool, this will mean that Reclamation has released water down the San Joaquin for the benefit of the Friant Contractors when water would otherwise be available from the Sacramento River. This should be clarified.

EC1-72 — Page 2-22. Line 30. In order to minimize flood risk, the maximum downstream extent and rate of Interim and Restoration Flows would be limited by then-existing channel capacities. As channel or structural modifications are completed, Interim Flow releases could be increased correspondingly in accordance with the new then-existing channel capacities. There is no explanation as to how the program will be phased in order to allow for increased flow releases that will not cause downstream damage. Reclamation should specify exactly which projects in Phase 1 and Phase 2 will allow for increased channel capacity, by what amounts, and what mitigation measures will be necessary to avoid adverse impacts to downstream land owners and water agencies.

EC1-73 — Page 2-23. Line 1. The Draft PEIS/R appears to define "then-existing channel capacities" as capacity that corresponds "to flows that would not significantly increase flood risk from Interim and Restoration Flows in the Restoration Area." However, this definition fails to include seepage damage. The San Joaquin River sits up gradient of many, if not all of the surrounding fields. Flow from the San Joaquin River travels downhill into the adjacent lands and, thus far, seepage damage has been documented at least three miles away from the river. Therefore, flows must be kept at a level sufficiently low to not induce seepage damage. This paragraph goes on to identify three objectives. In addition to limiting flows to those that would remain in-channel, which apparently Reclamation limits to flood flows, either this second objective should be amended to include seepage impacts, or a fourth objective should be added that addresses the avoidance of seepage impacts.

EC1-74 — Page 2-23. Line 2. Text refers to "flows that would not significantly increase flood risk".. Revise text to acknowledge "no increase in flood risk".

EC1-75 — Page 2-23. Line 23. This paragraph discusses the maintenance of flows below estimates for then-existing channel capacities. *See* prior comment.

EC1-76 — Page 2-23. Lines 34-37. The document discusses the application of levee design criteria presented in the U.S. Army Corps of Engineers Engineering Manual (USACE), EM 1110-2-1913, Design and Construction of Levees, throughout the Restoration Area. It is understood that USACE criteria for levees may vary slightly from district to district and it is recommended that the requirements for the levees meet the requirements of the Engineering Manual, and any additional requirements of the Sacramento District of the USACE.

EC1-77 — Page 2-23. Lines 34-41. In lines 34 through 39, the discussion refers to maintaining a minimum factor of safety of 1.4 and refers to Table 2-6 from Engineer Manual EM 1110-2-1913, which presents minimum factors of safety for slope stability analyses. The discussion on lines 40 through 41 of this page then defines the Factor of Safety as the reciprocal of the exit gradient. This factor of safety, as defined in the

EC1-77 cont'd

Draft PEIS/R document on the basis of the exit gradient, is the result of a different type of analysis than the analysis referred to in Table 2-6. Table 2-6 refers to slope stability analyses, which are typically performed using a limit equilibrium analysis of the forces causing potential slope failure, and the forces resisting potential failure. The factor of safety as defined in the Draft PEIS/R for exit gradients is estimated from a flow net or finite element analysis of the seepage through and below the levee. The factor of safety for seepage erosion as defined in the text assumes the critical exit gradient is 1.0. Based on experience with the USACE on other projects in the Sacramento District, it is understood that their criteria for evaluation of seepage erosion are more stringent. It is understood that USACE uses a lower exit gradient that depends on the case being analyzed.

In summary, evaluation of the potential performance of the levees will require, among other things, evaluation of the composition of the levees and foundation materials, analysis of several modes of potential slope stability failure, as well as evaluation of seepage through and under the levees. Therefore, these analyses cannot be addressed with a single factor of safety requirement. Considering the potential for differences in interpretation of criteria, it is recommended that a more detailed and site specific summary of the design criteria, considering all potential failure modes and considering specific USACE District requirements, be established.

EC1-78

Page 2-24. Line 19. The proposed Channel Capacity Advisory Group should include a representative from CCID. CCID's extensive knowledge of San Joaquin River channels and local flood operations are integral to channel capacity assessment.

EC1-79

Page 2-25. Line 1. The proposed Channel Capacity Advisory Group must have a clear authorized purpose and there must be agreed upon procedures, protocols, and performance standards in place to guide the review and response to comments provided by the group. There must be a formal process for Reclamation to respond to and resolve comments provided by the group.

EC1-80

Page 2-25. Line 5. The Channel Capacity Advisory Group is recommended to include members from Reclamation, DWR, USACE, Lower San Joaquin Levee District (LSJLD), and CVFPB. Given that the levees are adjacent to the lands owned and operated by the members of the Exchange Contractors, an additional member from the Exchange Contractors or one of the adjacent irrigation districts should be included in the Advisory Group.

EC1-81

Page 2-25. Line 10. This paragraph discusses the preparation of a report regarding the upper limits of releases for Interim or Restoration Flows that will not exceed channel capacities. However, while the Channel Capacity Advisory Group will be providing recommendations, this paragraph seems to imply that Reclamation could increase flows even if the Advisory Group advised Reclamation to not increase flows. What is the point of the Advisory Group if Reclamation does not intend to follow its advice?

EC1-82

Page 2-25. Lines 33-39. The text refers to maintaining a factor of safety of 1.4. As discussed previously, the criteria established for safe performance of the levees cannot be expressed by a single factor of safety requirement. A more detailed and site specific summary of the criteria, considering all potential failure modes, should be established.

EC1-83 Page 2-26. Lines 1-7. A more detailed description of the process to evaluate levees should be provided. The evaluation of levees with respect to the USACE criteria will require detailed assessments of the current levee configurations, adjacent land uses, and topography, past flow conditions, and future flow conditions. Detailed subsurface explorations would be required to understand potential changes to seepage conditions.

EC1-84 Page 2-26. Lines 11-14. Use of the one-dimensional HEC-RAS hydraulic model described in Appendix I provides only a theoretical estimate of in-channel flow capacity and does incorporate enough information to determine in-channel flows that would have a less-than-significant effect on flood risk. Flood risk is dependent on many other physical factors and local knowledge of the specific reach under investigation. The Draft PEIS/R should also reference the Seepage Management Plan and supporting groundwater thresholds identified in Appendix H of the plan.

EC1-85 Page 2-26. Lines 15-24. The text describes an analysis of exit gradients but compares this to the USACE criteria for factors of safety from slope stability analyses. The criteria for evaluating seepage erosion and exit gradients differ from the factor of safety requirements for slope stability analyses, as discussed in a previous comment. Also, the description of the exit gradient criteria refers to one mode of potential failure (seepage erosion) that should be evaluated for the levees. As discussed previously, the criteria established for safe performance of the levees cannot be expressed by single factor of safety requirement. A more detailed and site specific summary of the criteria, considering all potential failure modes, should be established.

EC1-86 Page 2-27. Line 1. Reclamation needs to establish a process to implement recommended monitoring and management actions submitted by the Channel Capacity Advisory Group.

EC1-87 Page 2-28. Line 18. It is clear based on the results of the interim flow studies that implementing the Settlement has already and will continue to require increased O&M activities.

EC1-88 Page 2-28. Line 32. Under what authority does Reclamation propose to re-operate the Chowchilla Bypass Bifurcation Structure to convey Restoration Flows into Reach 2B? The bypasses are operated for flood control, not river restoration. Yet, Reclamation proposes modifications to the operating criteria to allow for the routing of Interim and Restoration Flows during non-flood operations to meet flow targets in Reach 2B.

EC1-89 Page 2-29. Line 3. The Draft PEIS/R proposes to re-operate the San Joaquin River Headgate Structure to convey Restoration Flows into Reach 4B1. The draft notes that current conveyance capacity is unknown and could be as low as zero. Reclamation should consider an alternative that does not route any water down Reach 4B1 and uses an alternative pathway to route water through a less expensive route that does not require the level of mitigation that would be required for Reach 4B1. For example, would a low-flow channel in the existing bypass provide a sufficient alternative? Could a low-flow channel be constructed adjacent to the existing bypass system that would have sufficient capacity to pass a flow of 475 cfs?

EC1-90 Page 2-29. Line 19. The Draft PEIS/R calls for operation and monitoring of the Hills Ferry Barrier. It states the main purpose of the barrier is to redirect upstream-migrating adult fall-run Chinook salmon to

EC1-90 cont'd

the Merced River and to prevent migration into the main stem of the San Joaquin River upstream of the barrier. For WY 2011, the barrier failed to perform. At least 70 fall-run salmon "migrated" upstream. These salmon represent 10% of the run on the Merced River. There are false reports that these salmon migrated up to Friant Dam. Rather, one or two salmon "migrated", *i.e.* were transported, up to Friant Dam with the help of the California Department of Fish and Game (DFG). DFG employees were spotted manually lifting fish over dams and carting them upstream. All 70 or more of these fish perished. How will the Hills Ferry Barrier be maintained in the future to prevent this upstream migration? What specific measures are going to be taken to make the barrier operate effectively, if that in fact is the stated intent? Are there alternatives to the maintenance of the Hills Ferry Barrier? The barrier is essentially nothing more than a fence. The draft should analyze installing a more effective facility.

EC1-91

Page 2-30. Line 11. In order to return wet-year water to the Friant Division, the Draft PEIS/R projects that Friant Division and non-Friant Division water users could develop additional local conveyance and storage capacity to increase their ability to receive wet-year water supplies. Given that there are no projects defined that would accomplish this, on what basis is this assumed in the Draft PEIS/R?

EC1-92

Page 2-31. Line 20. Recapture of flows in the Restoration Area at Mendota Pool appears to violate the provisions in the Repayment Contract that prohibit delivery of water to the Exchange Contractors absent the existence of certain conditions. The routine delivery of water to the Exchange Contractors down the San Joaquin River for the benefit of the Friant Division does not appear to come within the exceptions under the Repayment Contracts. Please explain.

EC1-93

Page 2-31. Line 20. No detail is provided regarding the implications of recapturing Restoration Flows at the Delta. An analysis must be provided of the potential adverse impacts to other water users due to the resulting increase in take of endangered species.

EC1-94

Page 2-31. Line 20. This paragraph states that additional agreements would be needed between Reclamation, DWR, Friant Division Long-Term Contractors, and other South-of-Delta CVP/SWP contractors. There is no discussion of the agreements, the nature of the agreements, which contractors, etc. Detail must be provided.

EC1-95

Page 2-34. Line 1. Section 2.4.2 discusses what projects are being analyzed at the program level of review. There is no discussion of mitigation measures necessary to prevent flooding and seepage damage. For example, under the Seepage Monitoring and Management Plan, will Reclamation be installing interceptor lines, slurry walls, or other measures? Since flows are being analyzed at the project level, mitigation for those flows must also be identified and analyzed. The likelihood of impacts to nearby farmlands is already known to some extent.

Since documenting the damage to Nickel Farms (*See* Protests filed by Exchange Contractors at the State Water Resources Control Board, included as attachments), additional evidence of similar damage has been reported by landowners downstream of Friant Dam. A record of the types of damages experienced by the landowners was maintained for specific seepage sites within the service area of the CCID. These areas are near the river in Reaches 3 and 4A. Within CCID, the 3000 cfs peak flood flow of WY2011 impacted lands a full three miles from the river. CCID maintains 60 shallow pezometers within the area showing that the 3000 cfs flows seeped into the groundwater sufficiently to raise groundwater levels into crop root zones

over the 3 mile wide area (roughly 40,000 acres). A year end analysis of the shallow groundwater will be provided by CCID.

This damage is of the same type as that to the Nickel Farm. However, this damage was not caused by the Interim Flows. Rather, the damage was caused by flood flows at 3000 cfs during the Winter/Spring of 2011. However, what is important to consider is that the flood flows of 3000 cfs in Reaches 3 and 4A are well below the flows proposed to be released by Reclamation under the SJRRP. Pursuant to the hydrographs in the Settlement, Reclamation is seeking the right to release flows as high as 4500 cfs. This represents a 50% increase over the flows that caused the seepage damage in the Winter/Spring flood flows. In years when the hydrographs for the SJRRP mandate flows of this magnitude the conditions are substantially different than in flood years. In flood years, once the floods are over, flows recede to low levels very quickly and the river becomes a seepage outlet for the surrounding lands, *i.e.,*. groundwater accretes to the river.

EC1-95 cont'd

The existing river system without the Phase 1 and Phase 2 improvements, plus related mitigation measures, seeps as much as 10 cfs per mile into the surrounding groundwater. The seepage elevates groundwater which cannot recover to a lower level that is compatible with the crops being grown unless (1) projects are installed to address seepage or (2) flows are reduced. During WY2011, Reclamation recognized the need to reduce flows into Reaches 3 and 4A to zero (0) cfs following the 2011 flood flows until groundwater levels returned to "farmable levels."

The following farms have suffered from flood damage:

Shawn Coburn Farm
Pickalok Farms
Wolfsen Brothers
Stanley Cotta
4-W Ranch (Willis)
Goodman Brothers (Trindade)
Maiorino Farms (Porter Estates)

EC1-96

Page 2-36. Line 21. The Draft PEIS/R states that no additional agreements would be required to recapture flows within the Restoration Area. This is incorrect. O&M agreements are needed with the CCID concerning operation of the Mendota Pool and the San Luis Canal Company concerning operation of Sack Dam. (*See* SWRCB Order WRO 2010-0029 DWR, Cond. 13)

EC1-97a

Page 2-37. Line 1. The Draft PEIS/R discusses briefly common restoration actions and includes those in Settlement Agreement paragraphs 11(a) and 11(b). According to the Draft PEIS/R, the settlement stipulates that these actions are to be completed by December 31, 2013. How will these actions be completed by that date, given that there are insufficient funds available to construct these projects? According to recent analysis, the construction of the Mendota Pool Bypass and modifications to Reach 2B have increased in cost by almost 100%. Will construction of these facilities be possible, given lack of funds? The draft does not analyze this circumstance. Is Reclamation considering alternatives? The draft does not analyze this circumstance. At line 24 is mentioned screening the Arroyo Canal and providing fish passage at Sack Dam. This project has been expanded substantially from that set forth in the Settlement. The Draft

EC1-97b

EC1-97b cont'd PEIS/R should be updated to reflect the latest changes to these projects, including the construction of a new dam, rather than merely the provision of a fish ladder at Sack Dam.

EC1-98 Page 2-37. Line 36. The Draft PEIS/R discusses the Phase 2 action of potentially routing up to 4,500 cfs through Reach 4B1. There is no authorization to undertake this project. Pursuant to the Act, a feasibility report must first be submitted to Congress and funds must be authorized and appropriated. The text should be modified to reflect this requirement.

EC1-99 Page 2-38. Line 5. The Draft PEIS/R mentions that paragraph 14 of the Settlement stipulates that spring-run and fall-run Chinook salmon reintroduction is to occur by December 31, 2012. The reintroduction of salmon requires the construction of facilities to support these fisheries. No money is available for facilities. How does Reclamation propose to proceed with reintroduction, given that none of the Phase 1 or Phase 2 facilities will be in place consistent with the timelines set forth in Appendix C of the Settlement? The draft does not analyze this circumstance.

EC1-100 Page 2-39. Lines 7-11. LSJLD needs to be included in any study to determine needed conveyance modifications to maintain existing levels of flood protection.

EC1-101 Page 2-39. Line 13. The Draft PEIS/R discusses the Mendota Pool Bypass and Modification to Reach 2B. The purpose of creating a bypass channel around the Mendota Pool is to convey at least 4,500 cfs from Reach 2B to Reach 3 by avoiding certain habitat issues present in the Mendota Pool. The Draft PEIS/R fails to identify alternatives to the bypass proposal. Yet, Reclamation has actively assessed alternatives that would accomplish the same purposes as the bypass and not included those in the Draft PEIS/R. Included with these comments are documents from the "Value Engineering" effort that was undertaken by Reclamation. One alternative to the proposed Mendota Pool Bypass and Modification to Reach 2B is not to construct the bypass and to expand the river channel through the Mendota Pool. This option would save well over $100 million in construction costs. It would avoid many of the problems associated with the Mendota Pool Bypass project currently being considered. It would also reduce the loss of prime agricultural land. The draft does not analyze this alternative.

EC1-102 Page 2-40. Line 7. The Draft PEIS/R discusses the lack of availability of channel capacity to simultaneously handle Restoration Flows, flood flows on the San Joaquin River, flood flows from the Kings River, and the potential need to meet the senior water rights of the Exchange Contractors. The text acknowledges that "the Secretary would prioritize flood control and water right delivery obligations over meeting Flow targets for Restoration Flows, reducing Restoration Flows in those Reaches if channel capacity is insufficient to meet conveyance of flood control or water delivery obligations in combination with Restoration Flows." This acknowledgement by Reclamation of its responsibilities regarding flood control and senior water rights is appreciated.

EC1-103 Page 2-40. Line 17. The Draft PEIS/R discusses modifications to Reach 4B1 to convey at least 475 cfs. The draft states that to create capacity for 475 cfs, "substantial construction" would not be necessary. How is Reclamation defining "substantial construction"? In order to protect adjacent landowners in Reach 4B, Reclamation may need to construct levees, interceptor lines and/or slurry walls. Are these "substantial construction"? What other actions would be considered substantial construction?

EC1-104 Page 2-40. Line 24. The draft discusses modifying Reach 4B1 in a manner that could include the establishment of a low-flow channel to support fish migration. If Reclamation is going to the trouble of constructing a low-flow channel, it would seem more economical and efficient to construct the low-flow channel in the existing bypass system, rather than creating an altogether new channel through Reach 4B. By constructing a low-flow channel in the bypass system or adjacent to the bypass system, Reclamation would be accomplishing the same ends, that is, providing hydrologic connectivity the entire length of the San Joaquin River and providing a passageway for migrating salmonids and other fisheries. To reconstruct Reach 4B1 seems unnecessarily expensive and fails to accomplish the goals of the Restoration Program in the most efficient, least environmentally damaging way possible.

EC1-105 Page 2-40. Line 28. The draft discusses the type of work that would be necessary in Reach 4B1. Apparently, five road crossings may require modification. Further, culverts may need to be installed, the channel restructured, and clear-span bridges may need to be constructed as well. These seem to be projects involving substantial construction. Please explain why these are not considered substantial construction.

EC1-106 Page 2-41. Line 9. The Draft PEIS/R discusses modifications to the Sand Slough control structure and notes that it "could" present a barrier to upstream fish passage. Since the Sand Slough control Structure is designed to be boarded up to force flow into Reach 4A, and the Reach 4A will divert at least 475 cfs under all alternatives, the Sand Slough Control Structure "does" present a barrier and the language should be appropriately amended.

EC1-107 Page 2-41. Line 29. The Draft PEIS/R discusses modifications to the Eastside and Mariposa Bypasses to enable fish passage. Pursuant to Paragraph 11(a)(8) of the Settlement, modifications are to be made on an interim basis until completion of Phase 2 actions. Similarly, Paragraph 11(a)(9) calls for the construction of a low-flow channel if the Secretary determines that this modification is necessary to support fish passage. If Reclamation is going to construct low-flow channels through the bypasses, what justification is there to construct a redundant low-flow channel through Reach 4B1? No additional fishery benefit is identified. Reclamation should explain and analyze why one low-flow channel is not sufficient for fish passage. To the extent that creating passage in Reach 4B1 is a political decision, there is no environmental justification for that project. Reclamation should focus on projects that accomplish the Restoration goal and not projects that satisfy political agendas, Further, the construction of a low-flow channel in the bypasses or adjacent thereto may be the "least environmentally damaging practicable alternative." *See* CWA Section 404(b)(1); 40 C.F.R. § 230.10(a); *Butte Envtl. Council v. United States Army Corps of Eng'rs*, 620 F.3d 936 (9th Cir. 2010).

EC1-108 Pages 2-41 and 2-42. The Draft PEIS/R discusses modifications to the bypass system to allow for fish passage. Fish passage occurs into the late spring and possibly early summer. Temperatures in these reaches can be lethal to salmon. No temperature study is included in the draft. Reclamation should explain the feasibility of using the bypasses for fish passage that will provide suitable habitat for the various life stages of up- and down-migrating salmon. Given that this is a programmatic document, the entirety of the action must be discussed.

EC1-109 Page 2-42. Lines 15-18. The description of Mud and Salt Sloughs on line 18 as "potentially false migration pathways" should eliminate the word "potentially," as Mud and Salt Sloughs are false migration

EC1-109 cont'd pathways. The phrase "potential false migration pathways to migrating adult salmon may be present in Mud and Salt Sloughs . . ." should be changed in the underlined portion to are present.

EC1-110 Page 2-42. Line 38. The sentence "gravel pits could contribute to juvenile salmon mortality" should be changed to "gravel pits will contribute to juvenile salmon mortality." Numerous studies on the Tuolumne River and other rivers have demonstrated that gravel pits are areas of high predation and disorientation for migrating salmon. (*See* Vogel 2011.)

EC1-111 Page 2-43. Line 3. The Draft PEIS/R indicates that pursuant to paragraph 14 of the Settlement, the reintroduction of spring-run and fall-run Chinook salmon should occur by December 31, 2012. Throughout the Draft PEIS/R, it is stated that the Phase 1 and Phase 2 projects are "necessary" to protect salmon. It makes no sense to introduce salmon before facilities are in place that will allow for (a) adequate flows, (b) suitable habitat, (c) passage, and (d) mitigation of impacts to third parties. The reintroduction must be delayed because there are insufficient funds to support successful reintroduction. Until the necessary facilities are constructed, any reintroduction is premature. The draft should analyze the impact of introduction prior to the completion of the Phase 1 and Phase 2 projects.

EC1-112 Page 2-43. Line 21. The potential actions for salmon reintroduction include the use of the existing San Joaquin hatchery by Friant Dam, another existing hatchery or a new hatchery. The Draft PEIS/R fails to discuss the use of any of these hatcheries or a new hatchery. Construction is associated with each of these three alternatives and they should be discussed in this programmatic document.

Apparently, it is anticipated that hatchery use would be phased out over time as the fish population is reestablished. At what number of returning sustainable salmon would hatchery use be phased out? Discontinued altogether?

EC1-113 Page 2-43. Line 31. This paragraph discusses the permits to be issued to the USFWS by NMFS. There is no discussion in the draft PEIS/R regarding the potential terms and conditions of these permits. Further, the draft indicates that "specific environmental effects related to the reintroduction of spring-run Chinook salmon would be addressed in the subsequent project-specific NEPA analysis, and possibly CEQA analysis . . . ." This is improper project splitting. The programmatic document must analyze the whole of the action. (*See* discussion of improper segmentation in Section I.C of these comments.) If project level review is required thereafter, that may be conducted by another agency. This draft should discuss the various considerations related to reintroduction of salmon, including all factors pertaining to salmon survival and the establishment of a self-sustaining population. Among these would be temperature, dissolved oxygen, pollution, predation, habitat to support each life stage, gravel restoration, large woody debris, gravel pits, water quality constituents of concern, and other issues.

EC1-114 Page 2-45. Lines 14-33. Reclamation recognizes that floodplain and side-channel habitat modifications may be necessary outside of reaches 2B and 4B to benefit fish. Reclamation commits that such modifications would be confined to existing levee alignments. Site-specific capacity studies will be necessary to ensure priority flood flow and priority irrigation deliveries can be maintained with added habitat and that any required additional levee improvements are included.

EC1-115 Page 2-46. Line 34. The Draft PEIS/R provides two sentences on the need to reduce the potential for aquatic predation of juvenile salmonids. Predation is a huge issue. Studies by Vogel (2010) indicate that as much as 90% of migrating salmonids are taken through predation. The draft merely acknowledges that additional actions not identified in the Settlement may be necessary to prevent predation. A far more thorough discussion of the predation problem is required. Any number of physical measures as well as changes in fishery management may be necessary, and all of these measures have environmental consequences. This should include issues pertaining to changes in water temperature, the provision of suitable habitat, reduction in the number of predators, flow management to discourage predators, and other measures.

EC1-116 Page 2-46. Line 38. The draft acknowledges that unscreened and poorly screened small diversions can entrain migrating juvenile fish. The Settlement does not address this issue, and the draft merely identifies that there could be a range of potential actions to prevent fish entrainment at small diversions. Reclamation should document the number of small diversions and the steps necessary to mitigate for entrainment. One of the purposes of the interim flows is to identify this issue. A mere four sentences in the draft is insufficient.

EC1-117 Page 2-47. Line 3. The draft contains a brief discussion of obstacles to successful migration of anadromous fish in the Restoration Area. The draft notes hydraulic conditions at road crossings, small tributaries with unsuitable habitat, hydraulic conditions in the river channel at low flow, and other physical features within the river. The draft notes that a range of potential actions beyond the actions stipulated in the Settlement could improve fish passage. Among these measures are establishing low-flow channels, trap and haul of both juveniles and adults, modifying road crossings and installing barriers to prevent straying. A mere one paragraph is set forth regarding the establishment of low-flow channels and trap and haul. The draft should contain a far more thorough discussion of the challenges to fish passage, including not only the actual waterways, but the necessity for habitat modifications to support salmonid life stages.

EC1-118 Page 2-47. Line 24. The draft acknowledges that it may be necessary to implement a trap and haul operation to sustain Chinook salmon within the Restoration Area if protective features are not completed in time to reintroduce fish. Reclamation suggests it may reintroduce salmonids prior to the completion of all Phase 1 actions. **This is unacceptable.** As commented elsewhere, the expert witnesses all based their recommendations on the presence of new facilities to address the life stage of salmonids. Reclamation has not identified which Phase 1 actions are <u>not</u> essential to the survival of salmonids and the success of the program. Yet, the Draft PEIS/R repeatedly states that the Phase 1 actions are necessary for the success of the program. Is Reclamation proposing to operate a trap and haul program indefinitely? Given the lack of funds, is a trap and haul program the only viable alternative? If so, what volumes of water are necessary to operate a successful trap and haul program? How would fish be recovered from the river prior to reaching Mendota Pool? Reclamation should set forth the elements related to trap and haul in this document and provide at least a programmatic level of analysis of a trap and haul program.

EC1-119 Page 2-47. Lines 24-43. This section refers to a plan to implement a trap-and-haul program for both adult spring Chinook as well as downstream migrant juveniles "if protective features are not completed in time to reintroduce fish." Clearly, it is known now that funding for these protective features (*i.e.*, Phase 1 projects) will not be forthcoming any time soon. Therefore, we must conclude that the implementing

agencies fully intend to start a trap-and-haul program. Yet we have seen no evaluation of such a program to determine if it is even remotely feasible. Various program documents clearly document the challenges associated with getting adults to successfully migrate upstream to Reach 1 even with adequate fishways. It is recognized that there will be multiple migration routes, false passage ways, and dead end traps (*e.g.*, Mendota Pool as discussed in next comment). The notion of finding a site or facility that could facilitate the effective capture of all or most of the adult migrants is simply unrealistic. The situation for downstream migrants is even worse. Based on studies of spring Chinook juvenile migrations in Sacramento River tributaries (Butte, Mill, and Deer creeks), it is clear that many, perhaps most, of the Chinook fry produced in Reach 1 will disperse downstream to Reaches 2-5 shortly after emergence over a period of several months (McReynolds, et al. 2007, Harvey-Arrison 2003). Effective and safe collection of these fry and smolts could only be accomplished with a criteria screen facility, which necessarily would need to be supported with a concrete structure and a dam to control hydraulics. It would have to handle the entire river flow of up to 4,000 cfs. No such "temporary" facility is contemplated. Any notion of using juvenile traps or net systems to effectively and safely capture most of the juveniles (as would be required) is out of the question. Therefore, it becomes obvious that the salmon reintroduction program will be successful only if the Phase 1 flow routing, fishways, and screening facilities are completed before fish are introduced to the river.

EC1-119 cont'd

EC1-120

Page 2-48. Line 1. What road crossings will require modification? What types of modifications are being considered?

EC1-121

Page 2-48. Line 8. What types of barriers are going to be installed to prevent straying? One of the purposes of the Interim Flows is to identify areas where fish could stray. What determinations regarding where straying will occur have been made thus far? Depending upon which flow-routing decisions are made, where would the barriers be installed? There are few routing alternatives, and Reclamation should set those forth and discuss each of the elements associated with each routing.

Page 2-49. Line 12. Section 2.4.3 discusses the Physical Monitoring and Management Plan ("PMMP"). The component plans include flow, groundwater seepage, channel capacity, propagation of native vegetation, and suitability of spawning gravel. These actions are analyzed at a project level in the Draft PEIS/R. Long-term actions are analyzed at a program level. Appendix D sets forth the PMMP.

EC1-122

Page 2-49. Line 30. The draft mentions the reduction or avoidance of adverse or undesirable seepage impacts. The standard in the Act is that seepage must be fully mitigated. The mere reduction of adverse or undesirable seepage impacts is unacceptable and would violate the Act.

EC1-123

Page 2-51. Line 7. Immediate management actions at a project level address seepage concerns. The draft states that the objective is to reduce, redirect or re-divert Interim or Restoration Flows to reduce flow in downstream reaches in order to avoid seepage impacts. The Seepage Monitoring and Management Plan Work Group is discussing various measures to mitigate for seepage impacts. Included with these comments are working papers from the Work Group. As is evident from the attached document, there is considerable discussion regarding alternatives related to seepage impact. Yet, this supposed project level of review fails to identify and analyze the various impacts being discussed within the Seepage Monitoring and Management Plan Work Group. As such, the project level analysis is insufficient. For example, there is no discussion of where to install interceptor lines, slurry walls, or other such measures. There is no discussion of keeping

EC1-123 cont'd flows at levels low enough to avoid seepage problems. There is no discussion of the need to substantially reduce or eliminate flows following major flood events to allow groundwater levels to recede to non-damaging levels. There is no discussion of seepage thresholds/triggers, the need to avoid salt uptake, capillary action, or other issues that could damage the route zone. Also included with these comments are the comments of the Exchange Contractors to the WY2012 Supplemental EA which raise concerns with the seepage management program.

EC1-124 Page 2-51. Line 32. The draft discusses the modification of releases from Friant Dam to flush or mobilize gravel. Why is Reclamation not going to simply rely on the periodic large flood flows to mobilize gravel? These flood flows occur in about one out of five years. This should be sufficient for gravel mobilization.

EC1-125 Page 2-52. Line 1. The draft discusses long-term management actions at a programmatic level. Among the actions discussed are management actions to address seepage problems. The actions include purchasing easements and/or compensation for seepage effects, construction of slurry walls to reduce seepage flows, construction of seepage berms to protect against levee failure, construction of drainage interceptor ditches to protect affected lands, or the installation of tile drains on affected lands. All of these measures should be addressed in the near-term actions, rather than long-term actions. These actions are necessary to mitigate for the adverse impacts of Interim and Restoration Flows. Such flows must be maintained at non-damaging levels in order to avoid seepage impacts. If Reclamation intends to maintain flows at non-damaging levels without installing the appropriate mitigation facilities, can such low levels support the fish reintroduction program? If so, why would greater flows be needed? If greater flows are needed, then the mitigation measures must be implemented prior to any increased flows.

EC1-126 Page 2-52. Lines 23-25. Reclamation acknowledges that immediate responses have not yet been developed to contribute to project-level vegetation management objectives. Page 2-52 (lines 23-25) notes that active plantings and irrigation of desired native plants may be used as long-term management actions to contribute to long-term objectives for native vegetation. The document needs to describe the short-term vegetation management actions and articulate what tools Reclamation will bring to bear to address conflicts and issues with respect to vegetation management and how potential impacts on third parties would be mitigated...

EC1-127 Page 2-52. Line 31. Section 2.4.4 discusses the conservation strategy that applies to the conservation of listed and sensitive species. The conservation strategy must not interfere with agricultural and water management on the part of any third parties. Does Reclamation anticipate any interference with agricultural or water management?

EC1-128 Page 2-54. Line 11. Table 2-7 presents a list of actions, not a conservation strategy. A true conservation strategy should be developed to support the Restoration Program.

EC1-129 Page 2-55. Table 2-7. Providing a list of very broad and generalized conservation measures does not substitute for a comprehensive conservation strategy. We recommend that comprehensive measures (not just lists of actions) be developed to address how potential impacts may be minimized or avoided.

EC1-130 Page 2-55. Table 2-7 identifies conservation measures for biological resources that may be affected by Settlement actions. The SJRRP must not create wetlands that interfere with agricultural or water operations.

EC1-131 Page 2-56. Table 2-7, VP-3 concerns compensation for the temporary or permanent loss of habitat. Any lost habitat must be compensated from willing sellers only. The project should be designed to avoid impacts to third parties. The table notes that any impacts that result in a compensation purchase will require an endowment for land management in perpetuity before any project groundbreaking activities. This is an extremely important and necessary provision. It should not be assumed that any land manager, whether a non-profit or otherwise, will stay in existence to manage the land in perpetuity. A source of funds must be identified that provides a perpetual and adequate revenue stream for land management. Local interests should be included in any discussion and implementation of land management activities.

EC1-132 Page 2-57. Table 2-7 continues regarding conservation measures and identifiers for critical habitat. The comments above to VP3 are applicable with respect to any impacts to critical habitat. Further, the above comments are applicable to each of the different conservation measures discussed in Table 2-7.

EC1-133 Pages 2-60 to 2-79. Tables 2-7, DBC-3, VELB-3, GGS-2, SWH-2, and others. Reclamation's commitment to compensate for unavoidable losses to sensitive resources by establishing populations of these resources on permanently protected public resource lands, or on non-public lands acquired through fee-title or by conservation easement agreements. All mitigation on conservation easement lands must fully indemnify private landowners from ESA prohibitions and impacts to sensitive resources incurred during otherwise lawful activities. Protections may be afforded through Safe Harbor Agreements or by crafted language in easement agreements.

EC1-134 Page 2-75. Table 2-7 discusses the Southern Distinct Population Segment of North American Green Sturgeon. Have there been sightings of green surgeon on any parts of the San Joaquin River? If so, which parts? Are green sturgeon realistically expected to migrate upstream through the sandy portions of the river?

EC1-135 Page 2-78. Table 2-7 discusses Central Valley Steelhead. Is there any evidence of steelhead as far south on the San Joaquin River as above the confluence with the Merced River? Item (b) states that the Hills Ferry Barrier will be operated to exclude steelhead from the Restoration Area. Given that the Hills Ferry Barrier has been unable to exclude salmon, how can it be operated to exclude steelhead? What changes in structure or operation will be necessary to ensure that steelhead will not migrate upstream? If steelhead migrate upstream, how will they be managed? Will NMFS adopt a 4(d) rule to address steelhead?

Item (i) states that the San Joaquin River channel will be designed to decrease or eliminate predator holding habitat in coordination with NMFS. This is an extremely important component. Steelhead will be subject to similar predation problems as salmon. Given that filling in the gravel pits is a Phase 2 project, and that there are insufficient funds to even complete Phase 1 projects, will remediation of the gravel pits be moved up in priority? This would be a valuable, "no-regrets" type of action. It would benefit salmonids in the entire San Joaquin River, as it would decrease the bass population. Further, it is a comparatively low cost measure as compared to the other Phase 1 measures.

EC1-135 cont'd

If steelhead will be migrating upstream of the Hills Ferry Barrier, they, too, must be covered by a 4(d) rule. While steelhead have not been addressed in the Settlement, any restoration actions that bring this threatened species into the Restoration Area must be the subject of a 4(d) rule.

EC1-136

Page 2-77. Table 2-7 discusses Sacramento Valley winter-run Chinook salmon. Is there any evidence that Sacramento Valley winter-run Chinook salmon occur on the San Joaquin River? What recordation of occurrences are there? Is there any reason to believe that these are not simply strays, rather than an effort to reestablish a winter-run population? If winter-run were to reestablish on the upper San Joaquin within the Restoration Area, what impacts would this have on the Restoration Program?

EC1-137

Page 2-77. Table 2-7 discusses Central Valley spring-run Chinook salmon. The Draft PEIS/R fails to discuss the various environmental issues that may be associated with reintroduction of spring-run salmon. According to Table 2-7, spring-run salmon are analyzed at both a project and program level. Yet, the main fisheries chapter of the Draft PEIS/R, chapter 5, fails to discuss spring-run salmon.

EC1-138

Page 2-80. Line 9. Section 2.5.1 describes alternative A2 which includes expanding Reach 4B1 to 4,500 cfs and Delta recapture. The paragraph commencing at line 9 should also mention that Reach 4B1 will not be expanded until Reclamation submits a report to Congress and Congress appropriates the funds to expand Reach 4B1.

EC1-139

Page 2-80. Line 23. The draft states that until modifications are completed to convey at least 4,500 cfs in Reach 4B1, the bulk of the Interim and Restoration Flows would be routed through the Eastside Bypass. It could take years before funds are available to accomplish Phase 2 or later actions. If the Eastside Bypass is being used for several years to convey high flows, what justification will there be to reconstruct Reach 4B1 for this increased capacity? There is no obvious benefit to the fishery and an exceptionally large cost for restoration.

EC1-140

Page 2-82. Line 1. The draft states that the extent of potential flood plain habitat through Reach 4B1 has not been identified. Yet, it speculates that flood plains in Reach 4B1 could provide significant benefits for salmon and other native fish. No benefits are identified. What benefits would result? Given that the water in Reach 4B1 will be too warm for salmon to inhabit during the spring, summer and early fall, why is this Reach appropriate to create holding habitat? Should not this reach, if used at all, be constructed so as to encourage salmon to move as quickly as possible upstream and downstream? If flood plains are created, it will cause salmon to linger. They will perish due to predation and poor water quality conditions.

EC1-141

The comments offered to Alternatives A1 and A2 are applicable to Alternatives B1, B2, C1 and C2.

Page 2-90. Line 31. Section 2.10 addresses alternatives considered and eliminated from further consideration. At line 31, the draft discusses the potential release of Restoration Flows of a different timing and magnitude than those presented in Exhibit B of the Settlement. The draft improperly dismisses implementing alternatives to the Exhibit B flow schedule because it "would be inconsistent with the Settlement. This action was not retained because it would prevent achieving the SJRRP purpose." The statement is confusing. Were alternative flows not considered because they would be inconsistent with the Settlement, or were alternative flows not considered because it would prevent achieving the purpose of the SJRRP, which is to (1) restore spring- and fall-run Chinook salmon to the upper San Joaquin River and

EC1-141 cont'd

(2) recapture as much of the flows dedicated for Restoration purposes for the benefit of the Friant Contractors. The Settlement was merely a means to achieving this end. It was not necessarily the only way that reintroduction could occur. Reclamation must conduct full NEPA review, including consideration of all alternatives. The Settlement is but one alternative. Flow recommendations by Dr. Moyle and by Dr. Hanson should be considered. Further, given that the Phase 1 projects cannot be funded at this time, Reclamation must consider as an alternative the maintenance of flows at non-damaging levels and whether a salmon fishery could be restored on the basis of those lower flows.

EC1-142

Page 2-91. Line 1. The draft dismisses the utilization of the Chowchilla Bypass to route Interim and/or Restoration Flows. The draft argues this action was not retained because it would prevent achieving the SJRRP purpose and need, consistent with the Settlement. Again, the dismissal of this alternative raises a question of confusion between the achievement of the SJRRP purpose, *i.e.*, salmon restoration, and the Settlement. As stated above, the Settlement is but one alternative for achieving salmon restoration. It may be that using the Chowchilla Bypass, Mariposa Bypass and/or Eastside Bypass is the best and least environmentally damaging alternative to achieving salmon restoration. While the salmon may not use the entire length of the "main stem" of the San Joaquin River, this may be the most practical way to achieve a self-sustaining population of salmonids.

EC1-143

Page 2-92. Section 2-11 discusses Settlement implementation. The discussion fails to cite the Act and the applicable provisions thereof.

EC1-144

Pages 2-92 – 2-93. Table 2-8 discusses site specific environmental documentation for Settlement actions that are completed or are in progress. Reclamation is in the midst of assessing mitigation measures for seepage impacts. While NEPA/CEQA documentation is not yet completed, Reclamation should have started the scoping process for the development of interceptor lines and other mitigation measures.

EC1-145

Page 2-94. Line 11. The two paragraphs commencing at line 11 and finishing at line 26 identify actions to be taken before the release of Interim and Restoration Flows. Pursuant to the Act, mitigation measures were to be in place prior to the release of Interim or Restoration Flows. Reclamation failed to install physical mitigation measures, instead relying upon its ability to adjust flows to avoid damage. These two paragraphs should be amended to make it clear that mitigation measures will be put in place prior to the release of any further flows, whether Interim or Restoration Flows.

EC1-146

Page 2-94. Line 35. Section 2.11.1 describes strategies for implementation. One strategy is to group site-specific projects. This makes sense. However, when projects are grouped, they also require a larger critical mass of funding. Given the funding constraints, Reclamation should first identify "no regrets" projects that will not involve stranded costs in the event that the program cannot be completed. Chapter 3 of these comments identifies some "no regrets" projects that the Exchange Contractors recommend be developed first. Phasing of the program has always been important. It is unrealistic to think the entire program may be completed at once. This acknowledgement of grouping projects is consistent with the phasing concept. Reclamation should identify exactly which projects will be grouped and the order in which they will be constructed.

EC1-147

Page 2-95. Line 1. The draft notes that the release of Interim and Restoration Flows would occur over time as constrained by channel capacity, among other factors. This section then goes on to explain that

EC1-147 cont'd

until channel capacity limitations are addressed, the SJRRP would implement additional actions (such as Paragraph 11B and Paragraph 12 actions) and/or increase Interim and Restoration Flows up to the amounts specified in the Settlement. No mention is made of the need to develop the Phase 1 projects, *i.e.* Paragraph 11A projects, in a consistent manner as that described for the Paragraph 11B and Paragraph 12 actions. The Phase 1 actions cannot be developed until there is adequate funding and flows cannot be increased until mitigation measures are in place.

EC1-148

Page 2-95. Line 13. The draft notes that the SJRRP is being implemented concurrently with other programs that other agencies are considering to modify the San Joaquin River. The draft notes that DWR has identified deficiencies in flood conveyance capacity at several locations in the Restoration Area that were not identified for channel improvements in the Settlement. The draft then goes on to state "channel improvements to address these deficiencies in flood protection have not yet been identified and evaluated, and are not included in the Settlement (and therefore are not part of the action alternatives)." Failure to include all necessary mitigation measures, including deficiencies in flood conveyance capacity, violates the Act. While flood flows may exceed Restoration Flow levels, in general, Restoration Flows at 4,500 cfs are a rate equivalent to that experienced with flood flows. If the deficiencies in conveyance capacity are such that these Restoration Flows will cause damage, they must be mitigated prior to the release of flows at that level. Reclamation cannot avoid the responsibility to mitigate for these impacts just because DWR is moving more slowly. Further, simply because the Settlement did not anticipate these problems is not an excuse for overlooking or ignoring them. *Any* deficiencies identified through the NEPA process must be addressed and mitigated by the Secretary. (*See* Act, Section 10004(d).)

EC1-149

Page 2-96. Line 1. The draft discusses flood management and coordination with the LSJLD. The draft notes that a change in operations at Friant Dam may impact the guidelines for operation of flood management and water diversion facilities, including guidelines for splitting Interim and Restoration Flows at bifurcation structures. Further, a revised plan of flood control may be required that incorporates these guidelines and changes in operation. Yet, the draft does not discuss how any of these changes are being considered or the implications thereof. Certainly, Reclamation and DWR, its partner in the development of the Draft PEIS/R, have ample experience in flood control matters to be able to identify the range of alternatives that would be necessary to safely convey flood waters and Restoration Flows throughout the Restoration Area, including the bypasses. Deferring this analysis to another day is inconsistent with the requirements under NEPA to take a "hard look" at environmental impacts.

EC1-150

Page 2-96. Lines 8 - 10. The financial assistance agreement must be developed for "long-term" assistance and recognize that the LSJLD's ability to maintain the flood system directly impacts its ability to obtain a positive rating from DWR and obtain insurance.

EC1-151a

Chapter 5. Biological Resources – Fisheries

Overarching Fishery Discussion

This discussion summarizes the major issues of concern associated with the fisheries review of the San Joaquin River Restoration Program Draft PEIS/R.[87] The first section of the discussion describes the

[87] This discussion was prepared by biologists with the firm of CH2MHILL.

need to maximize the potential success of the restoration program by ensuring that all the Phase 1 projects stipulated in the settlement are fully constructed and operational prior to Chinook salmon being introduced into the San Joaquin River (SJR). The construction of these projects in full measure as stipulated in the settlement is necessary to meet the essential life-cycle environmental and habitat requirements of Chinook salmon. The second section presents a number of over-arching fisheries related issues and concerns associated with the formulation of the Draft PEIS/R.

1. Phase 1 Projects Should be Completed Prior to Re-introduction of Salmon

A successful restoration program can only be achieved if all of the priority habitat projects, and structural improvement work outlined as Phase 1 projects, are completed and fully operational prior to the introduction of salmon. Implementation of Phase 1 projects is required to improve conditions within the SJR to support the life-cycle needs of Chinook salmon, as shown in Table 1.

To our knowledge a detailed biological feasibility assessment of the program has never been conducted. Many concerns, uncertainties, and limiting factors have been identified and discussed in various program documents (Fisheries Management Plan, Reintroduction Strategies, Conceptual Models of Stressors and Limiting Factors) and expert testimony (Moyle 2005), but no firm conclusions have been offered regarding the overall probability of success of the Restoration Program. The Program's Fisheries Management Plan (2009) notes the following limiting factors need to be addressed to achieve restoration success:

EC1-151a cont'd

- Inadequate Streamflow
- Entrainment
- Excessive Straying
- Impaired Fish Passage
- Unsuitable Water Temperatures
- Reduced genetic Viability
- Degraded Water Quality
- Excessive harvest
- Excessive Redd Superimposition
- Excessive Hybridization
- Limited Holding Pool Habitat
- Limited Gravel Availability
- Excessive Sedimentation
- Insufficient Floodplain and Riparian Habitat
- Limited Food Availability
- Excessive predation

While the program intends to address all of these conditions to the extent practical and feasible, there is no guarantee that all these issues will be rectified successfully to allow a sustainable population of spring Chinook salmon to become reestablished in the SJR. There remains considerable uncertainty as to whether one of the most degraded stream ecosystems in the range of Chinook salmon can be restored to again support a sustainable salmon run. The life cycle of spring Chinook salmon is very complex, and their survival and

persistence in a watershed is dependent on favorable conditions associated with each of their life cycle needs. Being at the very southern end of the species range makes it even more critical that conditions to meet all of their life cycle requirements be favorable in most years.

The following section provides a discussion of the major uncertainties we believe are inherent to the reintroduction program and need further attention before the Program can proceed. These concerns are in addition to those already identified and discussed in the Fisheries Management Plan. Cumulatively, these concerns highlight the fact that the success of the Restoration Program will depend on adequately addressing all of the biological bottlenecks, limitations, and constraints facing fish survival. The most serious and obvious of these problems are addressed by the completion of the Phase 1 Projects. Therefore, it is essential that salmon not be introduced into the SJR until at least the Phase 1 improvement projects have been completed.

EC1-151a cont'd

These topics of concern include the following issues:

- Adult migration and passage
- Spawning and incubation
- Downstream migration and rearing
- Genetics of donor stocks, and
- Predation

a. Adult migration and passage

Successful adult migration to spawning areas is a critical requirement for a salmon population to persist. For spring Chinook especially, the migration window is narrow as defined by water temperature. Artificial delays at in-river structures or encounters with false or blind pathways can seriously affect migration success and ultimately spawning success. The Restoration Program has identified most of these potential barriers and false pathways and plans to construct fishways of exclusion facilities to allow free passage. While state-of-art (*i.e.* criteria) fishways (ladders) are usually quite effective, dealing with exclusion devises is often problematic. To keep adult salmon out of the bypass system, for example, will require an exclusion bar rack with 1-inch open spacing. These devices are very prone to debris accumulation during high flows, which will typically occur during the peak of the spring Chinook migration.

EC1-151b

Table 1. Phase 1 Projects and Expected Benefits to Fisheries

Phase 1	Project	Proposed Restoration Actions	Primary Benefits to Fisheries
1	Mendota Pool Bypass (to 4,500 cfs)	Construct bypass channel	Fish passage
		Construct upstream bifurcation structure	Conveyance of restoration flows
		Install fish screens and passage facilities	Cover and shading (water temperature)
		Create riparian habitat	Food resources
			Avoid predation at Mendota Pool
2	Reach 2B enlargement (for 4,500 cfs)	Construct levee and channel improvements	Fish passage
		Restore riparian habitat	Conveyance of restoration flows
		Reconstruct San Mateo Road crossing	Habitat for upmigrating adults and outmigrating

EC1-151b cont'd

		Screen diversions	Juveniles Prevent fish straying Food resources Water temperature (low flow channel, shading from riparian habitat)
3	Reach 4B1 enlargement to 475 cfs	Flows Routed Through SJR Mainstem: Construct levee improvements and associated river channel and floodplain Restore riparian habitat Reconstruct road crossings Screen diversions Screen and modify Mariposa Bifurcation Structure Flows Routed Through Bypass System: Construct levee and channel improvements Create riparian habitat Screen diversions Screen and modify Mariposa Bifurcation Structure	Fish passage Conveyance of restoration flows Cover and shading (water temperature) Food resources for outmigrating juveniles Prevent loss of fish from straying Fish habitat Refuge from predation Same as for flows routed through SJR Mainstem
4	Modify Reach 4B headgate	Modifications at headgate on the SJR channel to enable flow routing between 475 cfs and 4,500 cfs into Reach 4B1	Facilitate fish passage for upmigrating adult salmon and outmigrating juvenile salmon Conveyance of restoration flows
5	Modify or demolish Sand Slough Control Structure	Screen and modify or demolish structure	Facilitate fish passage for upmigrating adult salmon and outmigrating juvenile salmon
6	Arroyo Canal Fish Screen	Screen Arroyo Canal	Prevent entrainment and loss of upmigrating adult salmon and outmigrating juvenile salmon in canal and related irrigation facilities
7	Sack Dam Fish Passage	Replace or modify Sack Dam	Facilitate fish passage for upmigrating adult salmon and outmigrating juvenile salmon
8	Modify Eastside and Mariposa Bypass Structures	Modify drop structures in Eastside and Mariposa Bypass	Remove barriers to fish passage for upmigrating adult salmon and outmigrating juvenile salmon
9	Eastside and Mariposa Bypasses low-flow channels	Modifications in the Eastside and Mariposa bypass channels to establish a suitable low-flow channel	Facilitate fish passage for upmigrating adult salmon and outmigrating juvenile salmon
10	Mud and Salt Slough Barriers	Deploy fish barriers on Mud and Salt Sloughs	Prevent straying of adult and juvenile salmon into false migration pathways created by agricultural return flows

An adult migration problem that has not been adequately addressed in the program documents nor even mentioned in the Draft PEIS/R, is the situation at Mendota Dam when Kings River flood flows are routed to the Mendota Pool in wet years. Kings River flood flows have been routed to the Mendota Pool in 23 of the last 53 years of operation (USEPA 2007). These flows occur in the spring when adult Chinook are migrating. Springtime flows from the Kings River in wet years (approximately 1 in 4 years) range from approximately 1,000 cfs to 5000 cfs (USGS Gage No. 11253500 at Fresno Slough/James Bypass). At these higher flows Mendota Dam is not a barrier to upstream migrating Chinook salmon. In these wet years many, if not most, of the adult salmon go up Fresno Slough to the Kings River. There they are blocked and not able

to get back over to the SJR as flows recede. Fish stranded in Fresno Slough or Mendota Pool are trapped and will likely perish due to warm water, entrainment, or predation.

These situations when Kings River water is routed to Mendota Pool typically occur at the peak of the spring Chinook run. It is doubtful that the restoration program would be successful if a large percentage of the adult return is lost every 3 or 4 years, especially given all the other challenges facing the fish. A suggested solution to this problem might be to construct an angled bar rack (picket barrier) with 1-inch spacing (per standard criteria) in the river below Mendota Dam to direct fish to a ladder leading to the Mendota bypass (Donahue 2005). However, such a structure is not currently identified in the Program and may not be technically feasible in a low-gradient sandbed environment with a high debris load during these high flow flood conditions.

EC1-151b cont'd

An additional concern is the proposal, described on page 2-47 of the Draft PEIS/R, to rely on trap-and-haul operations to sustain Chinook salmon in the Restoration Area if all the Phase 1 facilities (*e.g.,* fishways and screens) are not completed in time to reintroduce fish. The notion of effectively collecting and trapping adult fish given all of the multiple passage routes, false passage ways, and dead end situations is unrealistic. The use of trap-and-haul for adults should not be contemplated for the Program under any conditions or timing. Clearly, all the adult fish passage facilities should be constructed prior to the introduction of fish.

b. Spawning and incubation

Spawning and egg incubation success for spring Chinook are very temperature sensitive (Moyle 2005). Because spring Chinook typically spawn in September and October, temperatures below Friant Dam may not be suitable in warm years, thus leading to pre-spawning mortality of the adults or high mortality of the deposited eggs. This problem has been identified as one of the potential limiting factors for successful reintroduction of spring Chinook to the SJR (Fish Management Plan: A framework for Adaptive Management in the SJR Restoration Program 2009).

Chinook spawn in numerous streams in California where the upstream migration is blocked by a dam. These streams include the lower San Joaquin River tributaries (Stanislaus, Merced, and Tuolumne) and the Klamath. A common observation in these cases is that most spawning activity occurs within a few miles of the barrier dam even though considerable spawning area is available downstream. This behavior was also observed for Chinook below Friant dam in the few years after the dam was completed (Moyle 2005). Extrapolating this common behavior to the San Joaquin spring Chinook restoration program suggests that spawning would be expected to actually occur only in the uppermost section of the 38-mile Reach 1. We have seen no discussion of this circumstance in the Draft PEIS/R or supporting documents. The telling fact here is that while most of Reach 1 may appear to provide suitable spawning habitat, the fish may only utilize a small portion of the reach. This may not affect the ability to establish a sustainable run, but would likely mean that the production goal (numbers of fish) described in the program documents is unrealistic.

EC1-151c

The Reintroduction Strategies Report, Page 10 (SJRRP 2011), cites 40 percent as the estimated survival rate from deposited egg to emergent fry. Yet on page 60 of the 10(a)1(A) Enhancement Permit Application (USFWS 2010) it is cited that "survival rates under natural conditions usually do not exceed 40 percent." So the average expected survival rate would have to be something less than 40 percent. There is little discussion to support this estimate except to note that it was obtained from studies done on the Tuolumne River under suitable water temperature conditions for both spawning and incubation. There is no

discussion of how conditions might differ in the expected spawning area of the SJR. However, a brief review of existing maximum daily water temperatures recorded 1.5 miles below Friant Dam reveal that temperatures are often suboptimal and sometimes critical for both Chinook spawning and incubation life stages (Stillwater Sciences 2003). Implementation of the Restoration Flow Schedule may improve conditions somewhat, but still would leave frequent periods of suboptimal conditions. Therefore, we conclude that the 40 percent egg-to-fry survival rate cited in the Permit Application and the Reintroduction Strategies Report is likely an overestimate for application to the SJR. Furthermore, this estimate does not include any consideration of the anticipated warmer conditions associated with future climate change, which would make temperature conditions even less favorable.

EC1-151c cont'd

c. Downstream migration and rearing

There seems to be an assumption for the Program that most of the spring run Chinook fry produced in the Reach 1 spawning area will remain in Reach 1 where they would rear through the summer and leave as yearlings later in the fall , winter, or possible the next spring (Moyle 2005). We have found little support for this assumption based on studies of Central Valley spring run Chinook. Rather, the literature is mixed regarding the rearing time and emigration dates for Central Valley spring run Chinook. Much of the observed differences in emigration behavior may be due to river or stock related (*i.e.* genetic) differences. For example numerous years of study on Butte Creek indicate the vast majority of the fry quickly leave the spawning reach and then follow a protracted dispersal or passive rearing/migration in the lower sections of the stream until they reach a size of 75-100mm before smolting and leaving the system as subyearlings in March –May (McReynolds et al. 2007). This migration pattern is similar to that which is typical to fall Chinook salmon. Studies on Deer and Mill Creek (tributaries to the Feather River), on the other hand, found that more than half of the juveniles outmigrated as yearlings (reared through the summer) (Harvey-Arrison 2003). Studies have consistently demonstrated that final movement will respond to environmental clues such as photoperiod, flow, and water temperature (Healy 1991).

EC1-151d

The innate outmigration behavior of the spring run Chinook that are ultimately introduced to the SJR (from Sacramento River sources) will strongly influence whether the reintroduction program will be successful or not. If most of the juveniles remain in Reach 1 through the summer as Moyle suggests, they would avoid the lethal temperatures and stranding that will occur in downstream reaches. Of course, under that assumption the available rearing area in Reach 1 will become the population limiting constraint. Rearing in the lower reaches will be limited to the relatively brief time that yearling smolts outmigrate to the Delta.

If juveniles move out of Reach 1 as fry, as studies on Butte Creek and to a large extent on Mill and Deer Creek would suggest, they would have one of two fates. First, the fry could grow fast enough in late winter and early spring in the lower reaches to become smolts and leave for the Delta before water temperature become too lethal. This would be the most favorable scenario. Second, the fry that take up residence in the lower reaches may not reach smolt size prior to summer or they may be genetically programmed to remain in the river until the fall (as in Mill and Deer Creek stocks) thereby left to encounter lethal conditions in the summer. Therefore, there is considerable uncertainty as to how the fry and pre-smolts will behave in the SJR, with some of the possibilities presenting significant challenges to the restoration program.

The uncertainty about fry dispersal and smolt migration is especially of concern given the proposal, described on page 2-47 of the Draft PEIS/R, to rely on trap-and-haul operations to sustain Chinook salmon in the Restoration Area if protective features (e.g. fishways and screens) are not completed in time to reintroduce fish. The notion of effectively collecting fry and smolts without having adequate facilities in place to do so is simply unrealistic. The use of any passive or active methods to collect juvenile Chinook should not be contemplated for the program under any conditions. Effective and safe collection of juveniles could only be accomplished with a criteria screen and collection facility (including a support and flow-control dam) capable of handling the entire river flow. No such facility is contemplated. Therefore, all of the Phase 1 flow routing and screening facilities must be completed and operational prior to the introduction of fish.

EC1-151d cont'd

The Program (*see* Reintroduction Strategies Report, pages 10-11) anticipates that the in-river survival of juvenile salmon (fry-to-migratory-smolt) will be 3-5 percent based on studies conducted on fall Chinook in the Stanislaus River. It is difficult to assess this rate because the definition of what is a migratory smolt versus a dispersing parr is necessarily vague. Nevertheless, the rate seems to be supported with good references. The applicability to the San Joaquin River, however, is questionable given that migratory conditions in the San Joaquin are likely much worse than those in the Stanislaus River from which the rate estimate was derived. Although there are plans to study and address many of the rearing and migratory problems (*e.g.* predation) in the lower SJR, there certainly will be realistic limits of what can be done in such an altered environment. The likelihood of extremely high predation rates from the known populations of nonnative fish species (*e.g.* stripped, largemouth, and smallmouth bass) occurring in the lower SJR is especially of concern, as discussed below. Effectively controlling populations of such predatory fish has always been a challenge to fish managers.

d. Genetics of Donor Stocks

Donor stock from which the experimental SRC salmon for the SJR will be eventually sourced will come from other drainage systems including Feather River, Butte Creek and Deer/Mill Creek (preferred alternative chosen by the Genetics Subcommittee of the SJRRP). Out of these, the Feather River spring-run appears to be significantly hybridized with fall-run Chinook (FRC), as evidenced by the high level of introgression with FRC genes, and acknowledged in the Hatchery and Genetic Management Plan (December 2010) (HGMP). It is also unclear whether the practices recently adopted by the Feather River Hatchery (FRH) to reduce hybridization between spring- and fall-run Chinook salmon are having any measurable benefits. Recent genetic analyses (Garza et al. 2008) suggest that Feather River SRC are heavily introgressed with FRC genes and essentially are not genotypically distinguishable as spring-run fish in the way that Butte and Mill/Deer Creek salmon are.

EC1-151e

Furthermore, the Feather River spring-run stock consists of both hatchery-spawned and naturally-spawned salmon. In contrast, the Butte Creek and Deer/Mill Creek populations show little evidence of introgression and apparently no hatchery influence as noted in the HGMP on pages 37 and 40.

As noted in the Stock Selection Strategy document (November 2010), page 7-1, the genetic risks posed by the Feather River fish due to hatchery fish influence and hybridization of FRC with SRC, prompted the Technical Advisory Committee (TAC) of the San Joaquin River Restoration Program (SJRRP) to recommend against the use of the Feather River Hatchery stock or any other hatchery origin stock for use in reintroduction (Meade 2007). However, the SJRRP still included the Feather River stock in the preferred

alternative (along with Butte and Mill/Deer creek stocks). The rationale that the Genetics Subgroup provided for using Feather River SRC salmon as part of the donor stock includes the fact that this stock appears to retain remnants of the phenotype and ancestry of the Feather River spring-run, and that through careful management of the broodstock, it may be possible to preserve some component of the ancestral Central Valley spring-run genomic variation. However, the Genetics Subcommittee acknowledges in the HGMP, pages 84-85 that there is no reasonable way to predict the outcome in terms of genetic variation and diversity.

EC1-151e cont'd

e. Predation

The SJRRP will provide perennial flows and improved in-channel conditions that will benefit salmon, but also will benefit other fish species including nonnative predators of salmon and other native species. Benefiting the establishment of nonnative salmon predators, which currently already dominate the fish community in the SJR (CDFG 2007), would be in direct conflict with the primary goal of establishing self-sustaining populations of salmon and other native fishes in the SJR. These nonnative game fish predators are widely tolerant of a range of environmental conditions (Moyle 2002) and, in contrast to native fish, will likely disproportionately benefit from implementation of many of the proposed restoration actions. The PEIS suggests that specifically targeted and comprehensive conservation measures will be undertaken to ensure that salmon and other native species have a fair chance of withstanding increased predation pressures in the River. But these Conservation Strategies (as proposed in Chapter 2 of the PEIS/R) are simply general statements that do little to convince the reader that the very significant threat of predation, and the challenges it poses to the success of the SJRRP, can be or will be successfully managed. Elsewhere in the Sacramento River basin predation has been established as a key factor preventing the recovery of salmon in recent decades despite expenditures of more than $1 billion for implementing habitat restoration, increased flows, harvest restrictions and other large-scale measures (Vogel 2011).

EC1-151f

It is also important to note that predation in the restoration area will be additive to the predation already known to be significant in the lower SJR below the Merced River and in the Delta. This adds even more uncertainty to the probability of success of the Program.

2. Overarching Fisheries-Related Issues and Concerns

a. Comprehensive Feasibility Study is Lacking

The SJRRP has forged ahead with the development of the PEIS/R without first conducting a comprehensive evaluation of the biological feasibility of this program as set forth in the original terms of the settlement. The very fact that Chinook salmon were excluded from the evaluation of impacts of the restoration alternatives in the PEIS/R (between Friant Dam and the confluence with the Merced River) highlights an implicit assumption that the Restoration Program is feasible without the benefit of a comprehensive feasibility study. We recommend that a biological feasibility study be conducted to fully assess the Restoration Program and set a roadmap for its implementation, in light of the current funding and scheduling constraints.

EC1-151g

The Restoration Goal established in the Settlement is, *"To restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish."* To

achieve this Restoration Goal, the Settlement calls for the release of Interim and Restoration flows from Friant Dam, various channel and structural improvements along the SJR below Friant Dam and the confluence with the Merced River, and reintroduction of Chinook salmon. The channel and structural improvements are stipulated in the Settlement, paragraphs 11 and 12, as Phase 1 and Phase 2 Improvements, and additional channel/structural improvements that upon implementation, may further improve the chances of achieving the Restoration Goal by improving the environmental and habitat conditions in the SJR for Chinook salmon and other native fish species. According to the draft PEIS/R, these "Restoration Actions", once implemented, would:

- Facilitate the passage of adults and juvenile fish in the SJR via in-channel improvements and removal or structural modifications of migration barriers and impediments
- Reduce or prevent fish straying and entrainment mortality by screening the numerous unscreened water diversions that exist along the SJR
- Facilitate suitable seasonal water temperatures and water quality through in-channel improvements to accommodate suitable in-channel flows and via shading by riparian vegetation
- Improve habitat for native fish by enhancing spawning and rearing habitat, implementing in-channel habitat improvements, and modifying or creating floodplain and side-channel habitats
- Reduce the potential for predation of juvenile salmonids by non-native fish species by isolating/filling in gravel pits in Reach 1, bypassing potential predation hotspots such as Mendota Pool, and creating floodplain habitat and other in-channel habitat features that act as predation refuges

EC1-151g cont'd

While the improvements identified in the Settlement will help address many of the limiting factors that contributed to the extirpation of Chinook salmon from the restoration area, considerable uncertainties and concerns remain about the ability of the Restoration Program to achieve the Restoration Goal, as discussed previously in this memo. A comprehensive biological feasibility study of the Restoration Program would have helped address many of those concerns, but was not conducted. These uncertainties and concerns about the Restoration Program are now further compounded by the fact that funding for the program may be insufficient and protracted; yet the Program has little chance of success unless all Phase 1 projects, at a minimum, are completed before fish are introduced into the river. There is thus even more of a need now to conduct a comprehensive biological feasibility study that takes into consideration the realities in program funding and schedule and evaluates the Restoration Actions under a modified timeline for introducing Chinook salmon to the system.

b. Bias in Evaluation of Impacts

EC1-152

There is an overall bias in the PEIS/R towards minimizing negative impacts and embellishing positive impacts (benefits) associated with implementation of restoration action alternatives, while playing up the negative impacts under the No-Action Alternative. This is often done in the PEIS/R without providing a sufficient basis or appropriate supporting evidence for specific impact evaluations, as pointed out on several occasions in the detailed Draft PEIS/R fisheries comments.

EC1-152 cont'd

In some cases, a closer look at the studies that were cited to support a particular impact evaluation in the PEIS/R revealed that these studies did not always accurately reflect or support the conclusions cited in the PEIS/R. For example, one potential impact would be the hybridization of hatchery-supplemented rainbow trout in Reach 1 with Central Valley Steelhead (CVS) that exist in the lower reaches of the SJR (below its confluence with the Merced River) and its major tributaries. Implementation of the restoration alternatives would provide these hatchery trout access to the lower reaches of the SJR where they could potentially breed with CVS. The PEIS/R, however, downplays this potential impact from hybridization by citing Zimmerman et al. (2009, mistakenly cited as Zimmerman et al. 2008 in the PEIS/R) indicating that substantial hybridization of these fish has already occurred in the lower tributaries, so it will not matter if it occurs as an impact from implementation of the restoration actions. However, a closer evaluation of the Zimmerman et al. (2009) article indicates that these authors concluded that the interpretation of their results was limited by small sample sizes and that additional studies were need to conclusively determine if hybridization has occurred between resident rainbow trout and CVS in these tributaries. So the fact remains that hybridization between hatchery supplemented rainbow trout and Central Valley steelhead could potentially occur and could be a significant impact from implementation of restoration actions, unless the PEIS/R can offer conclusive evidence (other than Zimmerman et al. 2009) otherwise.

EC1-153

In other cases, citations of studies were simply not used correctly to support specific impact evaluations (specific detailed comments on this can also be found in the SJRRP PEIS/R Draft Fisheries Comments). One example of this is noted in the citation of a study by Moore and Waring (1996) on the effects of diazinon (a pesticide) on Atlantic salmon parr to support an evaluation of potentially significant sub-lethal impacts on species such as Sacramento splitttail, black bass and striped bass under the No-Action Alternative. There are two inherent problems with this:

1. Atlantic salmon is used as a surrogate for another sensitive species that exist in the lower R. However, there is an increasing body of evidence that has demonstrated the limited effectiveness of using surrogates as management tools and by inference, as tools in impact evaluations, unless it is first established that the target species and surrogate species will respond similarly to a given set of environmental conditions (Caro and O'Doherty 1999, Caro et al. 2005, Murphy et al. 2011). While conservation biologists are developing processes and means to validate the use of surrogate species (Caro et al. 2005, Wenger 2008), there was no evidence or justification provided for its use in the PEIR/S.

2. A species such as Atlantic salmon is likely relatively more sensitive to environmental degradation than species such as Sacramento splitttail, black bass and striped bass (Brown 2000).

EC1-154

Other examples of incorrectly used citations under the No-Action Alternative are those of studies by Newcombe and Jensen (1996) and Bash et al. (2001) on salmonids to support an evaluation of potentially significant impacts of sediment discharge and turbidity on target species such as Sacramento splitttail, black bass and striped bass. This underscores a common theme within the PEIS/R to play up the negative impacts under the No-Action Alternative.

EC1-155

c. Over-Reliance on a Poorly Defined Conservation Strategy

Many of the "less than significant" or "beneficial" impact conclusions in the Draft PEIS/R are dependent on a Conservation Strategy (Ch. 2 of the Draft PEIS/R) that is used as a catch-all solution when Restoration Action alternatives are found to have potential impacts. Examples of instances where this is evident in Ch. 5 – Fisheries of the Draft PEIS/R include (detailed comments are in the comments to Ch. 5 and the appendices to the Draft PEIS/R):

- Impact FSH-1 (Restoration Action Alternatives A1 through C2): Changes in Water Temperatures in the San Joaquin River Between Friant Dam and the Merced River – Program level evaluation.
- Impact FSH-2 – Restoration Alternative A1 through C2: Changes in Pollutant Discharge in the San Joaquin River Between Friant Dam and the Merced River – Program level evaluation.
- Impact FSH-3 – Restoration Alternative A1 through C2: Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River – Program level
- Impact FSH-5 – Restoration Alternative A1 through C2: Displacement from Preferred or Required Habitat, Injury, or Mortality in the San Joaquin River Between Friant Dam and the Merced River – Program level.
- Impact FSH-8 – Restoration Alternative A1 through C2: Changes in Predation Levels in the San Joaquin River Between Friant Dam and the Merced River – Program level.

EC1-155 cont'd

In each of the above assessments, implementation of the Conservation Strategy is invoked to find a less than significant or beneficial impact. The Conservation Strategy, however, is just a broadly applicable and diffuse list of general conservation actions that only vaguely apply to a variety of impacts. For several impacts that were considered, more than one conservation measure listed in the Conservation Strategy could be expected to prevent or minimize adverse effects (e.g., avoiding disturbance to riparian vegetation to maintain shading and using barriers to exclude migrating salmon from the construction area, could both be measures implemented to minimize water temperature effects). It is thus left to one's imagination to guess which particular conservation actions will be specifically implemented to minimize a particular adverse impacts preventing a clear understanding of the proposed mitigation actions. Moreover, this approach does not provide sufficient information at all to allow one to assess the relative effectiveness of these conservation measures, once implemented.

EC1-156

The Conservation Strategy needs to be thoroughly evaluated and comprehensively developed. A targeted and expanded discussion of the specific conservation measures that would be implemented to minimize or prevent the potential adverse effects on special-status species is needed in the PEIS/R. It is also not clear whether some of these conservation measures will need to be implemented each year in perpetuity, and if so, which ones in particular. What assurances are there that these conservation measures are feasible and will work? What assurance is there that funding for implementation of these measures is available and will be available in the future when the Restoration Program itself is grossly underfunded? The PEIS/R needs to carefully consider these issues when developing a comprehensive Conservation Strategy and a plan for implementation of that strategy to ensure that the Restoration Program will not have adverse impacts on the SJR resources.

General Comments.

The greatest concern of the Exchange Contractors with the Draft PEIS/R is that it assumes that the Proposed Action will be sufficiently and timely funded such that the Phase 1 structural projects will be completed and operational prior to the introduction of spring-run Chinook salmon. But we now know that there is a large disconnect between the schedule laid out in the Settlement Agreement and the 2.5 year delay in enactment of the legislation, and the fact that the program is grossly underfunded. The Exchange Contractors believe that the focus of the program should be on how to achieve the highest level of success. However, introducing Chinook salmon into a system with multiple sources of certain mortality would be a guarantee for failure of the restoration program.

EC1-157

There may be a logical sequence of completing the structural projects, but almost all of them (e.g. fishways and screens) must be completely constructed and operational before any fish are introduced. The insufficiency and protraction of funding is a reality and cannot be ignored when assessing the impacts of the Proposed Action. The Exchange Contractors recommend that Reclamation consider another alternative to the Proposed Action that meets the Program goals (but not schedule) that reflects the funding and schedule reality.

EC1-158

The Exchange Contractors also recommend that Reclamation conduct a feasibility study that assesses the Restoration Program and sets a roadmap for its implementation especially in light of the limited funding available and delay in enactment of the legislation. The fact that a biological feasibility study has not been done to date perhaps reflects the optimism in getting the Program fully funded. Now that it is certain that funding will be insufficient and protracted, there is even more of a need to do a biological feasibility analysis for some yet-to-be-defined new program alternative that reflects the reality in funding and schedule.

EC1-159

In reviewing the fishery measures and discussion of potential impacts, there seems to be an overall bias toward minimizing the negative impacts and embellishing the positive impacts, at least as they pertain to the spring Chinook restoration goal. If a component of the Proposed Action results in an impact (e.g. increase predatory fish populations) that in turn adversely impacts the species for which the overall Proposed Action is intended to benefit, these impacts should be clearly identified as such. Please see the detailed comments for Fisheries pages 5-44 (lines 5-37) and 5-45 (lines 1-18); pages 5-70 (lines 3-9), 5-74 (lines 38-40) and 5-76 (lines 5-7); pages 5-70 to 5-76; page 5-91; and pages 5-94 (lines 38-42) and 5-95 (lines 1-14), which exemplify this approach undertaken in the PEIS/R to minimize negative impacts and embellish positive impacts without providing sufficient basis or appropriate supporting evidence.

EC1-160

Many of the "less than significant" or "beneficial" impact conclusions are dependent on conservation measures, many of which will be need to be implemented each year in perpetuity. What assurances are there that they will work? The "conservation strategies" cited in the PEIS are too vague and general to be meaningful (please see detailed comments for Fisheries pages 5-44 (lines 5-37) and 5-45 (lines 1-18); pages 5-70 (lines 3-9), 5-74 (lines 38-40) and 5-76 (lines 5-7); pages 5-70 to 5-76. Also, what assurance is there that funding for these measures will not be cut during the next budget cutting exercise? Again, the overall impact conclusions for the Proposed Action are predicated on the assumption that the entire program will be fully funded each year.

EC1-161

EC1-162 There is nothing in the PEIS/R that discusses how the program would be implemented in light of the funding shortfall. We have heard talk of "work arounds" (i.e., trap and haul, also mentioned in Ch. 2 of the PEIS/R) that might allow fish to be introduced prior to completing all of the Phase 1 structural improvements. If such "work arounds" are envisioned by the program, they need to be clearly identified and discussed in this context in some detail, and specifically with respect to any potentially adverse impacts on the spring-run Chinook salmon and other special status species the program is attempting to restore.

EC1-163 The terms "effects", "consequences", and "impacts" are all used. Are these all the same? If so perhaps use one for consistency. If not the same, explain the difference and how each is used.

EC1-164 The restoration alternatives considered and described in Chapter 2 of the PEIS/R (A1, A2, B1, B2, C1, C2) focus only on two major aspects of the program – the volume of flows for Reach 4B and recapture locations for restoration flows. Most of the Phase 1 and Phase 2 restoration actions, as stipulated in the Settlement, are grouped and considered under Common Restoration Actions (CRAs) that would require "future, separate project-specific planning studies and NEPA and/or CEQA documentation analyzing the effects of implementation." (pages 2-38 and 2-39 of the PEIS/R). These CRAs include potentially high priority habitat improvement projects that need to be undertaken in Reach 1 to enhance the success of achieving the Restoration Goal of establishing fish populations in "good condition" in the SJR including naturally-reproducing and self-sustaining populations of salmon and other fish. The isolation/filling of gravel pits is an example of Reach 1 habitat improvement projects that are part of the restoration actions (gravel pits) identified in Phase 2. The Exchange Contractors recommend that such improvements should be implemented before introducing fish into the river because Reach 1 provides critical habitat for salmon; it supports key components of the life cycle including holding habitat, spawning, egg incubation, emergence and juvenile rearing. Thus, maintenance of environmental conditions and other limiting factors within ranges that support and promote salmon survival, reproduction and growth is of utmost importance in Reach 1. The existing gravel pits in Reach 1 that are contiguous with the mainstem San Joaquin River could potentially have a variety of adverse effects on salmonid habitat quality and availability (Hanson 2005, Harvey 2005, Hradilek 2005). These gravel pits can interfere with geomorphic processes by intercepting and trapping sediment (Hanson 2005), thereby affecting spawning gravel recruitment and habitat conditions for spawning and juvenile rearing (Harvey 2005, Hradilek 2005). Because of their large depths and sizes, gravel pits will also have low water velocities and high water temperatures relative to conditions in the channel, and could promote increased abundance of warm water predators (e.g., largemouth bass) of juvenile salmonids. Juvenile salmon could also be trapped and become disoriented in these gravel pits, making them more potentially susceptible to temperature, predation, and disease related mortality (Hanson 2005). Isolation and filling of these gravel pits would represent a major, yet necessary restoration undertaking to ensure the success of achieving the Restoration Goal.

Specific Comments.

EC1-165 Page 5-1. Line 17. The draft states it was developed in part through review of scientific literature and existing data sources and identifies primary documents. The draft fails to identify the expert reports that were submitted as part of the litigation in *NRDC v. Rodgers*. These reports are highly pertinent to the SJRRP, as they largely framed the fisheries and facilities issues. In addition, CH2MHill performed an extensive studies in 2003, 2005 and 2007. These studies are being submitted with these comments. They

EC1-165 cont'd too represents an additional comprehensive review of issues surrounding development and implementation of the SJRRP.

EC1-166 Page 5-1. Line 29. Apparently, additional simulations are being prepared to determine the impacts of the program alternative under existing biological opinions. The results of these simulations will not be available until the final PEIS/R. Reclamation and DWR must provide an opportunity for the public to review and comment upon these simulations. How will this opportunity for additional review be accomplished?

EC1-167 Page 5-9. Line 12. The statement that the Chinook salmon run on the San Joaquin River was one of the largest on the Pacific Coast is not supported by the facts. The Lackey report in 2000 reported that the Columbia River Basin supported a historical run of between 11 and 15 million and California rivers supported a run of 5 to 6 million Chinook salmon. Assuming the split in California involves the Klamath and Russian Rivers as well as some other smaller runs, 200,000 to 500,000 the San Joaquin still only represents a maximum of 10% of the overall capacity of California making it unlikely it was one of the largest runs of any river in the US Pacific Coast area. Furthermore, given the hydrology of the San Joaquin, the runs were "opportunistic" with wet years the likely dominant source of the larger runs. Comparing those conditions to the wetter hydrology of the runs in Oregon and Washington is very suspect from the standpoint of overall productivity and/or sustainability. In fact, according to Lackey, the California runs make up less than 2% of the total capacity of all the runs of the Pacific Rim.

EC1-168 Page 5-15. Line 1. Section 5.2.3 summarizes the current aquatic habitat and distribution of fish in the five reaches in the Restoration Area and the Restoration Area bypasses. At line 5, the draft states that "A recent, comprehensive evaluation of aquatic habitat in the Restoration Area has not been performed; information presented in this section is compiled from existing information." This is a somewhat remarkable comment. Reclamation has released Interim Flows for the past two years. One of the purposes for releasing the Interim Flows was to conduct an evaluation of the aquatic habitat. Further, DWR has sent watercraft down the river to study the river itself. What have the agencies been doing over the past two years of Interim Flows and prior to that time such that they do not have a comprehensive evaluation of aquatic habitat? When will this information become available? When will the public be afforded an opportunity to see the analysis and comment upon it? Proper characterization of the aquatic habitat is essential to understanding the feasibility, practicability and likelihood of success for the SJRRP.

EC1-169 Page 5-15. Line 31. This section (following on page 5-16) discusses false migration pathways for adult salmon. Included are the numerous false bypass routes in the canal system and bypass system. The seriousness of these passage problems are not discussed in this or a later section of the PEIS/R in terms of their impact on the meeting of the Restoration Goal for spring-run Chinook. We consider this a major oversight in the Draft PEIS/R. The unintended migration of adult fall-run Chinook into the Eastside Bypass in the fall of 2010 and the harm that came to these fish attest to the seriousness of having adult salmon attempting to migrate through the bypass.

In addition, the false migration that will occur in the Kings River (Fresno Slough) in high flow years needs to be added to the list of problem areas. The issue of false passage into the Fresno Slough has been previously brought to the attention of Reclamation as documented in CH2M HILL (2003 and 2005) prepared

EC1-169 cont'd

for the San Joaquin River Resource Management Coalition and yet there is no mention of it in the PEIS/R. The problem will occur when surplus water from the Kings River is routed into Mendota pool. This has occurred in 23 of the 53 years of past operation (USEPA 2007). These flows almost always occur in the spring when adult SRC would be migrating. Springtime flows from the Kings River in wet years (approximately 1 in 4 years) are approximately 1,000 cfs to 5000 cfs (USGS Gage No. 11253500 at Fresno Slough/James Bypass). At these higher flows, Mendota Dam is not a barrier to upstream migrating Chinook salmon and adult salmon would pass up into the Kings River/Fresno Slough. There, they would be blocked and otherwise not able to get back over to the San Joaquin River. They may drop back down to Mendota pool as flows recede but there they would be trapped and would perish. Losing many if not most of the adult spring Chinook returns every 3 or 4 years is likely to have severe consequences to the Restoration Program's success, especially given all the other challenges facing the fish. A picket barrier below Mendota Dam was suggested in 2005 (Donahue 2005) but is not now included in the Program, perhaps because such facilities are generally considered non-feasible in a sandbed environment and under heavy debris load flood flow situations.

EC1-170

Page 5-17. Lines 29, et seq. This section provides considerable information on the amount of supposedly suitable spawning habitat available below Friant Dam. Although a judgment on suitability is not directly discussed, there is an inference that the quality is good. In Table 5-1, footnote 5 indicates that a maximum percent fines criterion of 40% (ocular estimate) was used. However, spawning substrates that support good egg and alevin survival generally have less than 20% fines (Kondolf 2000; Bjornn and Reiser 1996). Also, an ocular estimate is typically inaccurate because most fines are found below the surface and are not visible.

EC1-171

Page. 5-19. Lines 17-18. The statement that "few riffles were adjacent to suitable holding areas" raises yet another concern about the ability of the program to successfully meet its goal of producing a sustainable population of spring Chinook. The availability of holding habitat near spawning sites, riffles, is particularly important for spring Chinook because of their need for extended holding through the summer. They cannot hold in the lower river (below Reach 1) because of unsuitable water temperatures.

EC1-172

Page. 5-22. Lines 7-8. These lines state that "[t]he unstable sand substrates and extreme flow variability, in Reach 2 and Reach 4 are not likely to support high invertebrate densities." Further discussion is then needed to relate this conclusion to the fact that these reaches (and Reach 3) will be the primary rearing areas for juvenile spring Chinook. Studies in the Sacramento system clearly demonstrate that most (>90% in the case of Butte Creek) spring-run Chinook fry migrate downstream out of the spawning reach quickly after emergence from the gravel (Harvey 1995, McReynolds et al. 2007, Garman and McReynolds 2008). In the San Joaquin River, most Chinook fry would be expected to leave Reach 1 in January and February and seek rearing in Reaches 2-5. Yet these lower reaches admittedly will have low densities of macroinvertebrates, the primary food source for juvenile Chinook. Low fish growth would be expected to extend the time at which the juveniles reach smolt size (>80 mm [SJRRP Fisheries Management Plan 2009]), possibly delaying these fish in the river and increasing the likelihood of exposure to lethal water temperatures beginning in late spring or early summer. Further, food-limited and growth-constrained juvenile fish are more likely to be susceptible to predation and disease-related mortality.

EC1-173 Page 5-22. Line 35. The draft discusses fish assemblages currently found in the San Joaquin River. Yet, the draft never discusses the issues contained in the discussion in the prior pages regarding habitat and other conditions in the Restoration Area that would affect salmonids. Since this program is all about restoring salmonids to the San Joaquin River in the Restoration Area, it is bizarre that the environmental document does not contain a discussion, in context, of the various environmental conditions that will affect salmonids, how those effects can be ameliorated, and the types of actions necessary to create adequate habitat for all life stages of salmonids. The Draft PEIS/R should discuss each reach of the river, the habitat challenges within each reach, the suitability for salmonids, the interaction between existing habitat and the proposed Phase 1 and Phase 2 improvements, other measures that may be necessary, and the general issues that will have to be taken into account when the National Marine Fishery Service ("NMFS") develops its Endangered Species Act 4(d) Rule.

EC1-174 Page. 5-23. Line 13, et seq. This section documents the current fish assemblage in Reach 1 just below Friant Dam. The reach currently sees perennial flows and relatively cool water temperatures. Yet it supports a fish assemblage that is inconsistent with what one would expect to see in a stream supporting a healthy salmonid population. All of these species would be competitors with or predators of juvenile spring-run Chinook. Restoration activities in this reach as well as in the downstream reaches will likely benefit these species, as is acknowledged later in the Environmental Consequences section, to the detriment of Chinook survival. However, the impact of benefiting this fish assemblage on juvenile spring-run Chinook salmon is not addressed.

EC1-175 Page. 5-24. Lines 39-40. The statement that fish "could be routed into the bypasses" should be changed to "may become entrained into the bypasses." The use of the term "could be" can be misinterpreted to mean that the routing fish into the bypasses might be an intentional program action, which it is not. In addition, for those years when juvenile fish do become entrained into the bypasses, the Draft PEIS/R provides no analysis of the potential harm that will come to those fish.

EC1-176 Page. 5-27. Lines 1-6. The section is undoubtedly intended only to indicate that Chinook spawn in the lower San Joaquin River tributaries (Merced, Stanislaus, and Tuolumne). However, the stated observation that most spawning activity in these rivers occurs within a few miles of the lower-most barrier dam is a telling fact. Similar observations have been made elsewhere (e.g. Klamath River below Iron Gate Dam) at sites with a barrier dam. Extrapolating this typical behavior to the restoration of San Joaquin spring-run Chinook suggests that spawning would be expected to actually occur only in the uppermost section of the 38-mile Reach 1. We have seen no discussion of this circumstance in the PEIS/R or supporting documents, and yet this is critical to the ability of the Restoration Program to meet its numeric production goals and sustainability criteria.

EC1-177 Page 5-30. Line 9. Section 5.3 discusses the regulatory setting that includes the applicable federal, state, and local laws and regulations associated with fisheries in the study area. The draft does not list the San Joaquin River Restoration Settlement Act, Title 10, P.L. 111-11. This should be included and discussed in this section in the context of fishery measures.

EC1-178 Page 5-36. Table 5-2 includes actions included under the action alternatives. The table indicates that certain actions are analyzed at the project level and others at the program level. The table should specifically list those items that are set forth in paragraph 11 of the Settlement as Phase 1 and Phase 2 projects.

EC1-179 Page 5-37. Table 5-3 contains a summary of environmental consequences for fisheries. A substantial portion of the chart is devoted to changes occurring between Friant Dam and the Merced River. Many of these changes will affect the bass population and the introduced salmonid population. Yet, with respect to salmonids, there is no comprehensive discussion in the entire document that identifies how changes in the river will benefit or prove to be detrimental to salmonids. For example, salmonids will be introduced into the slow flowing, high temperature lower reaches of the upper San Joaquin River. The draft PEIS/R notes at page 5-24, lines 11-13, that all native species known to occur in the San Joaquin River in Reach 1 were also known to persist in Reaches 2-5, with the exception of rainbow trout and riffle sculpin. The fact that rainbow trout do not persist in Reaches 2-5 is an indication that the habitat conditions are not friendly to this species. The general thought is that if rainbow trout occupy the habitat, that it is also suitable habitat for anadromous salmonids. The lack of a trout population in these stretches of the river suggests that there are problems of substantial significance. Seasonal temperature gains in Reaches 3, 4 and 5 of the Restoration Area are substantial and potentially lethal. To some extent, increased flows may create more suitable habitat for salmonids. However, high temperatures likely cannot be addressed through flow alone without substantially increasing the flows over dramatic levels, and perhaps other measures. The heat gain during the warm spring, summer and fall months is simply too great.

EC1-180 Page 5-38. In table 5-3, FHS-10 summarizes the effects to fall-run Chinook salmon from hybridization resulting from the reintroduction of spring-run Chinook salmon to the Restoration Area. The impact is identified as less than significant. Yet, no actions are identified that will prevent the hybridization of spring-run and fall-run Chinook salmon. Hybridization has occurred on the Feather River. The Feather River is one of the identified potential sources of fish for reintroduction under the SJRRP. Given that the spring-run and fall-run Chinook salmon will be occupying the same portions of the river, what measures will be taken to prevent hybridization?

EC1-181 Page 5-45. Lines 1-18. Representative fish species selected for impact assessments included two categories: special-status species, which are all native fish including Kern brook lamprey, hardhead and Sacramento splittail, and representative game fish species such as black bass (includes largemouth bass, smallmouth bass and spotted bass), striped bass and rainbow trout. For all of the geographic areas considered in the PEIS/R, except the Delta, the nonnative game fish species considered in the PEIS/R including largemouth bass, smallmouth bass, spotted bass and striped bass are potential predators of salmon and other native fish species (McBain and Trush 2002; Fishbio Environmental 2011).

Given the fact that restoration of self-sustaining populations of Chinook salmon and other special-status species is a key goal of the SJRR Program, the PEIS/R fails to adequately discuss what it means if the impacts of the alternatives evaluated are found to be "less than significant and beneficial" to representative fish species, which includes these nonnative predators of salmon and other native species. Wouldn't benefiting the establishment of nonnative salmon predators, which currently already dominate the fish community in the SJR (CDFG 2007), be in direct conflict with the primary goal of establishing self-sustaining populations of salmon and other native fishes in the SJR? These nonnative game fish predators

EC1-181 cont'd

are widely tolerant of a range of environmental conditions (Moyle 2002) and in contrast to native fish will likely disproportionately benefit from implementation of many of the restoration actions proposed, unless specifically targeted and comprehensive conservation measures are untaken to ensure that salmon and other native species have a fair chance of withstanding increased predation pressures in the River. The Conservation Strategies proposed in Chapter 2 of the PEIS/R are simply "trust me" statements that do little to convince the reader that this very significant threat of predation pressures within the SJR and the challenges that it poses to the success of the SJRRP, is being taken seriously in this PEIS/R (see comment for page 5-73 (lines 19-20) and also the comments for pages 5-94 (lines 38-42) and 5-95 (lines 1-14)). Elsewhere in the Sacramento River basin, predation has been established as a key factor in preventing the recovery of salmon in recent decades despite expenditures of more than $1 billion for implementing habitat restoration, increased flows, harvest restrictions and other large-scale measures (Vogel 2011). A comprehensive evaluation and discussion of measures that will be specifically undertaken to address predation and its overall role in the success of the SJRRP is critically needed in the PEIS/R

EC1-182

Page. 5-45. Lines 5-4. We find it strange that the matrix portrayed in Table 5-4 contains no checkmark in the box for spring-run Chinook for the Project Area (Friant to Merced). This basically states that the PEIS does not assess the Proposed Action impacts to the very species that is the focus of the Proposed Action. Is this true?

EC1-183

Page 5-45. Line 14. Table 5-4 identifies fish species considered in the PEIS/R impacts assessment, by geographic area. While this table focuses on the San Joaquin River, there is no analogous table that focuses on the streams in the Sacramento Basin, where the SJRRP anticipates taking fish to benefit this program. Those impacts should be discussed in this document at the program level.

EC1-184

Page 5-46. Lines 19-23. Only the direct effect of water temperature on fish is considered for impact assessments in the PEIS/R; that is, known preferred water temperature ranges and optimal temperatures for migration, spawning, egg incubation, juvenile rearing, etc. are used to determine potential direct impacts on fish. However, interactive effects of water temperature on other processes such as feeding, disease, pollutant effects, etc. were not evaluated because of lack of data. These are extremely important effects that in some cases will likely have a direct bearing on the impact assessment. For example, even though Interim and Restoration flows may maintain water temperatures just within the physiological limits for a certain life stage, lack of adequate food resources may make the fish susceptible to disease and predation, even if temperatures are held within their tolerance limits. Lack of such data on these complex interactions, while understandable, is nevertheless a significant gap in this PEIS/R and should be stated as a significant constraint when interpreting water temperature related impact assessments.

EC1-185

Page 5-49. Table 5-6 summarizes environmental conditions for each representative fish species in the San Joaquin River from Friant Dam to the Merced River. Under the columns addressing black bass, there is no indication regarding how water temperature may affect these species. Yet, it is known that these species are attracted to warm water areas. The Interim Flows and Restoration Flows will introduce water to areas of the river that are currently not hospitable for black bass or striped bass. The population of these fishes will expand to those areas. Since they are predators of salmonids, this will have an adverse impact on salmonids. Conversely, it will have a positive impact on these undesirable fish.

EC1-186 Page 5-49. Lines 5-50. Figures 5-6 & 5-7. Significant amounts of information on the environmental conditions that are applicable to each representative fish species are unavailable or incomplete so as to introduce a high level of uncertainty in assessing impacts. Yet, there is no attempt at explicitly assigning levels of uncertainty to each assessment in the PEIS/R. These impact assessments hinge only on a handful of environmental conditions for which information is available. For example, significant gaps exist in information availability and/or our understanding of the impact mechanisms of pollutants, turbidity, geomorphic processes, habitat, predation, and food resources/food web support for all of the representative fish species in the SJR from Friant Dam to Merced River (as indicated in Table 5-6). Information is available for water temperature and its impact mechanism is well understood only for rainbow trout and for the spawning/incubation stages for Sacramento splittail, but not for any of the other representative species. The PEIS/R will benefit from the inclusion of levels of confidence associated with impact assessments for each species based on the availability of, and uncertainty associated with the environmental data that was considered in these evaluations. Lacking that, one can conclude that the majority of the impact evaluations in this PEIS/R inherently are associated with a high degree of uncertainty.

EC1-187 Also, turbidity is identified as a relevant environmental factor affecting species distribution in the assessment area in Tables 5-6 and 5-7, but there is no discussion of it in the ensuing text of PEIS/R (pages 5-51 to 5-63).

EC1-188a Page 5-51. Lines 12-14. The draft states "Characterization of species response was predicated on assumptions about environmental conditions that may or may not persist in light of accelerated climate change." What are these assumptions? These are not provided, but could be critical to impact assessments, and, especially, those related to changes in flow and water temperature.

EC1-188b So the fact remains that hybridization between hatchery supplemented rainbow trout and Central Valley steelhead could potentially occur and could be a significant impact from implementation of restoration actions, unless the PEIS/R can offer conclusive evidence (other than Zimmerman et al 2009) to show that it has already occurred in areas below the confluence with the Merced River.

EC1-189 Page 5-51. Line 23. The draft briefly discusses water temperature and water quality. The draft contains no meaningful information regarding water temperature in the Restoration Area. Rather, the reader is directed to various appendices accompanying the draft. Under CEQA, a discussion of the technical appendices is required within the main body of the environmental document. *See San Joaquin Raptor Center v. County of Merced* (2007) 149 Cal. App. 4th 645. Given the importance of temperature on the viability of salmon reintroduction, a significant discussion of temperature impacts should be set forth.

EC1-190 Page 5-54. Line 34. The draft discusses program level actions to improve or provide fish passage at existing or potential physical structures. Various actions to provide fish passage and improve habitat connectivity were listed. Yet, there is no analysis at the programmatic level of the various actions identified. Considerable information is available, for example, on the Mendota Pool Bypass Channel. Scoping has already occurred for the project level environmental analysis of this project. Such information as is currently available should have been included in the Draft PEIS/R. Included with these comments are materials made available thus far concerning the Mendota Pool Bypass Project.

EC1-190 cont'd

The draft goes on to list other actions such as barrier removal or modification; barrier and fish screen installations; habitat restoration to improve connectivity and passage; seasonal barriers or screens to reduce entry into false migration pathways; modifications to road crossings; and trapping and hauling of fish to upstream and downstream reaches as necessary. Yet, there is no discussion of each of these actions. For example, where are the barriers and what will removal entail? Where will fish screens be necessary? What types of habitat restoration to improve connectivity and passage are likely to be required? What false migration pathways are there that will need to be screened or blocked? What road crossings exist that provide passage impediments? How will trap and haul occur? Each of these should be discussed as comprehensively as possible at this point. Yet, there is no meaningful discussion within the draft.

EC1-191

Pages 5-56 – 5-57. The draft discusses the existence of diversions and pumps located on the San Joaquin River in the Restoration Area. It notes at page 5-57, line 6, that prevention of diversion-related losses would primarily benefit migratory species, including striped bass. By preventing the loss of striped bass, the striped bass population will likely increase. As mentioned above, increasing flows to other parts of the Restoration Area will provide additional habitat for striped bass and black bass and therefore increase their population. By benefitting striped bass, increased predation on other species, including salmonids, will occur. Yet, the draft indicates that there are less than significant impacts to the striped bass population and fails to discuss any impacts to salmonids. Increasing the bass population is adverse to the program. A thriving and hungry bass population in the Restoration Area could present a fatal flaw to the achievement of a self-sustaining salmonid fishery. The draft PEIS/R should include a comparative assessment of predation based upon conditions prior to the release of Interim Flows, current conditions and future conditions, based in part upon experience in other watersheds, e.g. Sacramento River (Vogel 2011).

EC1-192

Page 5-62. Line 3. The draft notes that implementation of Restoration Flows could provide fish passage throughout the Restoration Area, including allowing resident rainbow trout to interbreed with Central Valley steelhead. Since the rainbow trout are currently stocked and are of hatchery origin, such interbreeding could have an adverse impact on Central Valley steelhead. The draft fails to discuss and analyze this significant adverse impact on Central valley steelhead, a listed species.

EC1-193

Page 5-62. Line 15. The draft discusses the reintroduction of spring-run Chinook as being a high priority. Further, the draft makes the assumption that reintroduction of fall-run Chinook salmon would likely occur passively as a result of "straying" of fall-run salmon from other San Joaquin tributaries. Yet, the same paragraph, lines 27-36, states that the Hills Ferry Barrier will be operated to restrict access by fall-run Chinook salmon. This is a conflict that needs to be resolved. Either the barrier will be operated, or fall-run Chinook will be allowed to migrate upstream. If fall-run Chinook are allowed to migrate upstream, no analysis of the likelihood of hybridization is set forth. Given the amount of experience on the Feather River, specifically by DWR, a comprehensive discussion of hybridization is appropriate.

EC1-194

Page 5-62. Lines 16-14. In the discussion on hybridization impacts resulting from implementation of the restoration alternatives, it was stated that hatchery supplemented rainbow trout populations that currently exist in Reach 1 would have access to areas in the lower reaches of the SJR below the confluence with the Merced River. These rainbow trout could breed with Central Valley Steelhead that exist in the lower mainstem SJR and its major tributaries (Merced, Tuolumne and Stanislaus). The PEIS/R, however, later goes on to downplay this potential impact from hybridization of these two distinct populations of rainbow

EC1-194 cont'd

trout by citing a study by Zimmerman et al. 2009 (mistakenly cited as Zimmerman et al. 2008 in the PEIS/R) indicating that substantial hybridization of these fish has already occurred in the lower Tuolumne and Stanislaus Rivers, and so will not matter if it occurred as an impact from implementation of restoration actions. However, a closer look at that article indicates that these authors concluded that the interpretation of their results was limited by small sample sizes and that additional studies were need to conclusively determine if hybridization has occurred between resident rainbow trout and steelhead in these Central Valley rivers (quoting Zimmerman et al 2009 below):

> "With such a small sample size we are unable to draw conclusions about the contribution of progeny of rainbow trout females to the emigration of smolts….. Further work is needed to assess the contribution of rainbow trout progeny as smolts and the fate of these fish compared with smolts of steelhead maternal origin…… Further work is needed to better assess the contribution of steelhead and rainbow trout to the anadromous population of O. mykiss in streams throughout the Central Valley."

EC1-195

Page 5-66. Line 19. Section 5.4.2 discusses significance criteria. Effects on fish would be considered significant if program actions would have any of the described results. Among these results would be to have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special-status species in any local or regional plans, policies or regulations, interfere substantially with the movement of any native resident or migratory fish, or substantially reduce the abundance of any life stage of a federal or state special-status species or commercially important fish species. The draft does not contain a discussion of how the expansion of the bass population will have an adverse impact on salmon or steelhead. Yet, just below the Hills Ferry Barrier, the population of bass has expanded tremendously as a result of the commencement of Interim Flows. This expansion of the bass population has an adverse impact on salmonids. The draft must discuss these impacts.

EC1-196

Pages 5-67. Line 37, Page 5-68. Line 30, Page 5-69. Line 7. These lines all state that the impact of the No Action Alternative would be "potentially significant" (suggesting adverse). It seems like Reclamation tossed in global warming and the Grasslands Bypass Project into the program actions in order to create the conclusion that the No Action Alternative will have a significant impact. We recognize that the No Action Alternative has been defined to include cumulative impacts of other reasonably foreseeable actions out to year 2030 (but this was not so for the action alternatives?). Yet on page 5-66, the discussion of Significance Criteria, it clearly states that effects are significant if ***program actions*** (emphasis added) do the following: modify, interfere with, pose a hazard, reduce, modify…. The Grasslands Bypass Project and global warming are not "program actions." Therefore, the "potentially significant" impacts should be changed to "no impact.

EC1-197

Page 5-67. Lines 30-41, Page 5-68. Lines 1-23. Impact FSH-1 (No-Action Alternative): Changes in Water Temperatures in the San Joaquin River Between Friant Dam and the Merced River – Program Level. See comment below pertaining to Impact FSH-22 (No-Action Alternative) for Project Level, which also applies to this Program Level impact.

EC1-198

Page 5-68. Line 24. Impact FSH-2 (No-Action Alternative) The statement in this finding of a potentially significant impact with the "No-Action" alternative is fallacious and inflammatory. The proposed

EC1-198 cont'd

extension of the Grasslands Bypass Project will not increase discharges of agricultural pollutants. The Grasslands Bypass Project has already decreased the discharge of natural-occurring selenium and the extension allows for the ongoing construction of additional projects to reach a goal of zero discharge. 90% of the sources from agricultural operations have already been removed. The threat that exists and will continue to exist and potentially threaten fish and wildlife in the Program and "Restoration Projects" area with or without the Grasslands Bypass Project is the flood flows from the Panoche-Silver Creek watershed which is the source of the selenium. That threat will continue until the upper watershed sources are somehow acknowledged and managed. The physical nature of that watershed dictates the amount and frequency of introduction of the most significant amounts of selenium into the Program and Project areas. Flooding events that allow the water and sediment to leave the terminous of the current natural channel on the Valley floor near Belmont and Olive Avenues only have to travel an additional 8.8 miles to reach Mendota Pool. With an elevation difference of approximately 11 feet per mile in this final section of the flood discharge, this is the potentially significant impact, not the Grasslands Bypass project. Also see comment below pertaining to Impact FSH-23 (No-Action Alternative) for Project Level, which also applies to this Program Level impact.

EC1-199

Page 5-69. Lines 1-26. Impact FSH-3 (No-Action Alternative): Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River – Program level. See comment below pertaining to Impact FSH-24 (No-Action Alternative) for Project Level, which also applies to this Program Level impact.

EC1-200a

Page 5-70. Lines 3-9. Page 5-74. Lines 38-40. Page 5-76. Lines 5-7. Impact FSH-1 (Restoration Action Alternatives A1 through C2): Changes in Water Temperatures in the San Joaquin River Between Friant Dam and the Merced River – Program level.

The PEIS/R indicates that individual program-level actions could have short or long-term effects on water temperatures in the Restoration Area associated with construction or operation. There was no further discussion provided on the scope or magnitude of these expected water temperature impacts on special-status and/or game fish species at the program level, except that the impacts could be potentially adverse. However, a "less than significant" impact assessment was eventually determined in the PEIS/R for water temperature effects related to implementation of the Restoration Actions. This determination was based on invoking the implementation of special-status fish conservation measures PL-1 (Pacific lamprey, page 2-73), CVS-1, CVS-2 (Central Valley Steelhead, pages 2-76 and 2-77), EFH-1 and EFH-2 (Essential Fish Habitats for Pacific salmonids, pages 2-28 and 2-79) of the Conservation Strategy (chapter 2 of the PEIS/R), which according to the PEIS/R was expected to minimize or prevent potential adverse effects of water temperature on special-status species.

The conservation measures detailed in PL-1, CVS-1, CVS-2, EFH-1 and EFH-2, however, only consist of a broad list of general conservation actions items not all necessarily related to minimizing or preventing the potential adverse effects of water temperature, but also pertaining to impacts of predators, contaminants, sediments, construction and staging activities, fish straying, migratory barriers, among others. As such, the Conservation Strategy is a diffuse list of general conservation actions that only vaguely apply to a variety of impacts. Furthermore, more than one conservation measure listed under the five categories could be expected to prevent or minimize adverse effects (e.g., avoiding disturbance to riparian vegetation to

EC1-200a cont'd

maintain shading and using barriers to exclude migrating salmon from the construction area, could both be measures implemented to minimize water temperature effects). It is thus left to one's imagination to guess which particular conservation actions will be specifically implemented to minimize the adverse impacts, nor does this approach provide sufficient information at all to allow one to assess the relative effectiveness of these conservation measures, once implemented. A targeted and expanded discussion of specific conservation measures that would be implemented to minimize or prevent the potential adverse effects of water temperature on special-status species needs to be included in the text.

EC1-200b

In some cases, it was not clear how some of the listed conservation measures could be expected to directly avoid or minimize impacts. For example, CVS-1 (page 2-76) and EFH-1 (page 2-28) state that, "Impacts to habitat conditions (i.e., changes in flows potentially resulting in decreased flows in the tributaries, increases in temperature, increases in pollutant concentration, change in recirculation/recapture rates and methods, decrease in floodplain connectivity, removal of riparian vegetation, decrease in quality rearing habitat, etc.) must be analyzed in consultation with NMFS." While one understands the benefits of consultation with NMFS in terms of agency guidance on species conservation measures, how could this, in and of itself, qualify as a conservation measure?

EC1-200c

In other instances, the conservation measures appear to be quite vague. For example, in CVS-1 and EFH-1, it is stated that, "Maintenance of conservation measures will be conducted to the extent necessary to ensure that the overall long-term habitat effects of the project are positive." It is totally unclear what "Maintenance of conservation measures…" really means. Is the reference to maintenance of all the other conservation measures listed under CVS-1 and EFH-1, which does not quite make sense, or is the reference to "maintenance of habitats restored under a particular project?"

EC1-200d

Further, the conservation measures listed for CVS-1 and CVS-2 were identical to those listed for EFH-1 and EFH-2, respectively. As such, the conservation measures for Central Valley steelhead and Essential Fish Habitats for Pacific salmonids (and Starry flounder?) are essentially identical. It is unclear why these were listed at all as separate measures, and not combined instead.

EC1-200e

For all of the reasons stated above, invoking the Conservation Strategy as a blanket "cure-all" for instances when impacts were expected from implementation of Restoration Alternatives appears to be a totally unsubstantiated approach, and an uncommon one at that, adopted by the PEIS/R. Rather, it speaks of a "trust us" approach, rather than relying on data and a logically presented technical basis to support specific impact determinations (see below).

EC1-201

Page 5-70 - 5-76. The comments contained in the section above (Impact FSH-1 - Restoration Action Alternatives A1 through C2) also apply to several other impact assessments where conservation measures PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 are similarly invoked in the draft PEIS/R to determine a "less than significant" impact from implementation of Restoration Alternatives A1-C2. These include the following:

EC1-202

Page 5-70, Lines 10-22; Page 5-74, Lines 38-40; and Page 5-76, Lines 5-7: Impact FSH-2 – Restoration Alternative A1 through C2: Changes in Pollutant Discharge in the San Joaquin River Between Friant Dam and the Merced River – Program level. Potentially significant impacts on special-status and game fish species are expected, resulting from construction activities in the restoration area that could potentially introduce hazardous materials such as petroleum-based fuels and lubricants, paints, fertilizers and

EC1-202 cont'd herbicides used during site planting. However, implementation of conservation measures PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 is proposed in the PEIS/R as a blanket "cure-all" to minimize or prevent potential adverse effects of pollutants on special-status fish species.

EC1-203 Page 5-70, Lines 23-30; Page 5-74, Lines 38-40; and Page 5-76, Lines 5-7: Impact FSH-3 – Restoration Alternative A1 through C2: Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River – Program level. Potentially significant impacts on special-status and game fish species are expected, resulting from construction activities in the restoration area that could potentially introduce sediments into receiving waters. Implementation of conservation measures PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 is proposed in the PEIS/R as a "cure-all" to minimize or prevent potential adverse effects of sediments on special-status fish species.

EC1-204 Page 5-71, Lines 19-32; Page 5-74, Lines 38-40; and Page 5-76, Lines 5-7: Impact FSH-5 – Restoration Alternative A1 through C2: Displacement from Preferred or Required Habitat, Injury, or Mortality in the San Joaquin River Between Friant Dam and the Merced River – Program level. Potentially significant impacts on special-status and game fish species are expected, resulting from construction activities in the restoration area that could potentially displace fish from preferred habitats or habitats required for performing essential behaviors such as spawning or feeding. Implementation of conservation measures PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 is proposed in the PEIS/R as a "cure-all" to minimize or prevent potential adverse effects of displacement of special-status fish species from their habitats.

EC1-205 Page 5-71. Line 33. Impact FSH-6 for alternatives A1 and A2 discusses changes in habitat conditions in the San Joaquin River between Friant Dam and the Merced River. The brief one paragraph discussion concludes that improving habitat conditions for fish in the Restoration Area through the creation of new flood plain, riparian, and aquatic habitats, and other measures would have an impact that would be less than significant and beneficial. Yet, as discussed above, increasing habitat for bass species will have a detrimental impact on all other species that are prey. The draft contains no discussion of this issue. Further, by introducing flows and improving habitat conditions, other fish will be attracted to this area that will then fall prey to the bass fishery. This is not a less than significant or beneficial impact on those fisheries. The only discussion of predation changes occurs at pages 5-72 – 5-73. No quantification is indicated. Despite stating that restoration actions "could increase predation risk for representative special-status fish, especially juvenile life stages," without citing to any evidence the draft concludes that the impact would be less than significant and beneficial.

EC1-206a Page 5-72, Lines 40-42; Page 5-72, Lines 1-25; Page 5-74, Lines 38-40; and Page 5-76, Lines 5-7: Impact FSH-8 – Restoration Alternative A1 through C2: Changes in Predation Levels in the San Joaquin River Between Friant Dam and the Merced River – Program level.

Potentially significant impacts from increased predation risk on special-status and game fish species are expected, resulting from construction of fish passage structures, restoration of side channel, backwater habitats that would attract fish predators. Implementation of conservation measures PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 is proposed in the PEIS/R again as a "cure-all" to minimize or prevent potential adverse effects of increased predation on special-status fish species.

EC1-206b

In all of the above cases where significant impacts are potentially expected from implementation of Restoration Alternatives A1-C2, the blanket and broadly-generalized conservation measures listed in PL-1, CVS-1, CVS-2, EFH-1 and EFH-2 are simply invoked to eventually determine a "less than significant" impact without any clarity, further explanation or details provided whatsoever on which specific conservation measures would apply to each of those specific impacts, how these measures would be phased and implemented, or the prioritization process applied for implementation in cases where multiple conservation measures can address a particular impact. Simply providing a list of conservation measures (Chapter 2) does not substitute for a comprehensive conservation strategy. Lacking this necessary information, we strongly suggest that all of these specific impacts listed above be re-evaluated with targeted and comprehensive conservation measures (not just lists of actions) that adequately address how these potential impacts will be minimized or avoided. A detailed description of each impact and associated conservation measures should be provided.

EC1-207

Page 5-73. Line 9. The draft indicates that increased predation at fish passage facilities or structures could occur by creating conditions favorable for predators lying in wait. Restoration of side channels and backwaters would also increase predation risk. These quiet water habitats provide preferred habitat for predatory fish and could increase their populations. (Page 5-73, lines 14-16). The draft cites conservation measures CVS-1, CVS-2, EFH-1 and EFH-2 in the conservation strategy to reduce the effects of this impact to less than significant. Again, CEQA requires that readers not be required to refer to technical appendices to understand the basic impacts of the analysis. (See, *San Joaquin Raptor Center v. County of Merced* (2007) 149 Cal. App. 4th 645) A discussion of these conservation measures should be set forth in the draft.

EC1-208

Page 5-73. Lines 19-20. The statement combines the instream/floodplain conditions with filling of gravel pits to conclude that largemouth bass populations will be reduced. The filling of gravel pits would reduce bass populations, but it is incorrect that the instream and floodplain "improvements" would do so. Rather we agree with the statement made in the previous paragraph of the PEIS/R (page 5-73, lines 12-14) that the stream restoration activities will "increase the amount or quality of habitat for piscivorous fish such as black bass (e.g., largemouth bass, smallmouth bass and spotted bass)." As stated on lines 12-13, this increase in piscivorous species would increase predation risk on special-status species such as juvenile spring-run Chinook. We are not convinced that the conservation measures identified (chapter 2 of the PEIS/R) to address this predation concern in the restored channel, side channels, and backwaters will work in the long term. In fact we see no details whatsoever in the cited conservation strategies that would specifically address these critical issues; rather we only see vague promises in stated actions such as, "The San Joaquin River channel shall be designed to decrease or eliminate predator holding habitat, in coordination with NMFS." or, "The bottom topography of the San Joaquin River channel will be designed to decrease or eliminate predator holding habitat." We fail to see how these stated actions can be passed off as comprehensive conservation strategies which are necessary to address critical issues such as predation.

EC1-209

Page 5-80. Line 17. The draft states that water temperatures in Millerton Lake and the San Joaquin River upstream from the reservoir are expected to increase substantially by 2030. The draft states this could adversely affect rainbow trout and other species. Further, air temperatures from 2041 through 2060 are predicted to increase an annual average of 2.5 to 5 degrees F. Average summer air temperature is expected to rise by as much as 8 degrees F. Summer water temperatures in the San Joaquin River upstream from the reservoir are already stressful to coldwater species such as rainbow trout. The draft states that "predicted

increases in air temperature are expected to produce even more stressful water temperature conditions in the river by 2030. Surface water temperatures are also expected to rise in Millerton Lake, but most of the species in the reservoir are warm-water species that would likely not be adversely affected by the expected water temperature increases or potential associated decreases in DO concentrations." The draft concludes that this impact could be significant.

EC1-209 cont'd

If water temperatures in Millerton are going to increase substantially and air temperatures are going to increase substantially, this will have a dramatic impact on the success of the reintroduction of salmonids. In essence, the draft is stating that somewhere between 2041 and 2060, the water upstream of Millerton will become inhospitable to salmonids. This in turn will substantially decrease the cold water pool in Millerton, likely creating a cascading effect downstream, ultimately rendering the San Joaquin River below Millerton inhospitable for salmonids. If this is the case, it is hard to justify a program of this magnitude. If the project proponent is stating that it is possible that within approximately 15 or more years following the completion of the first phase of the program the river is likely to become inhospitable to the reintroduced salmonids, there is no analysis of impacts to the SJRRP or alternative means to protect the fish.

Page 5-82. Lines 4-8. Impact FSH-22 (No-Action Alternative): Changes in Water Temperatures and Dissolved Oxygen in the San Joaquin River Between Friant Dam and the Merced River – Project Level.

EC1-210

Predictions of air temperatures under future climates significantly depends on the choice of the Global Circulation Model (GCM) ensemble selected for the analysis. A GCM ensemble consisting of three GCMs (CSIRO-MK3.0, MIROC3.2, and UKMO-HadCM3) was used in the Draft PEIS/R to simulate projected increases in air temperatures for the restoration area, but no rationale was provided for the choice of this specific GCM ensemble over others. Given that the No-Action alternative is the baseline against which all other Restoration Action alternatives are evaluated, some rationale needs to be provided on the choice of this GCM ensemble and its relative advantages over other applicable GCM ensembles that could be used to predict future climates for the region.

EC1-211

Also, on page 5-67 (line 38), it states that climate change impacts have not yet been included in the SJR5Q model. How were air temperatures predicted by the GCM ensemble then related to in-stream water temperatures in the SJR to determine potential impacts on fish? Was a specific model used to relate air temperatures to water temperatures, or were these only qualitatively related? This was not very clearly presented in the Draft PEIS/R. Also, see comments above re potential impact of rising temperatures on habitat/water quality for salmonids below Millerton.

Page 5-82. Lines 9-13. Impact FSH-23 (No-Action Alternative): Changes in Pollutant Discharge and Mobilization in the San Joaquin River Between Friant Dam and the Merced River – Project level.

EC1-212

Currently, no existing contaminant-related water quality impairments have been identified within Reaches 1 and 2 that may affect special-status and game fish species under consideration for pollutant discharge impact analysis. The PEIS/R, however, indicates that the lower reaches are currently listed for a variety of contaminants such as arsenic, boron, mercury and pesticides, and that even though the special-status species (e.g., Sacramento splittail) and game fish species (e.g., black bass, striped bass) in these reaches have been found to be relatively tolerant of environmental degradation (Brown 2000), there may be potential sub-lethal impacts on fish at even low pollutant levels, according to a study by Moore and Waring

(2000). This particular study, however, focuses solely on pollutant impacts on salmonids (specifically, Atlantic salmon parr), which are generally less tolerant of pollutant stress than the non-salmonid species (e.g., black bass, striped bass) that are typically abundant in the lower reaches of the SJR, or the generally less abundant Sacramento splittail (Brown 2000). More scientific evidence is needed that focuses specifically on these non-salmonid fish species to support the determination of "potentially significant" impacts from changes in pollutant discharge in the SJR between Friant Dam and Merced River under the No-Action alternative.

EC1-212 cont'd

Page 5-82. Lines 14-18. Impact FSH-24 (No-Action Alternative): Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River – Project level.

The determination of "potentially significant" impacts on fish expected due to changes in sediment discharge and turbidity is questionable and not adequately supported by the studies referenced in the PEIS/R (i.e., Newcombe and Jensen 1996; Bash et al. 2001). The focus of this impact assessment is the special-status and game fish groups consisting primarily of Sacramento splittail, black bass (largemouth bass, smallmouth bass and spotted bass) and striped bass that are found in the lower reaches (primarily Reaches 4 and 5) of the Restoration Area, and where turbidity levels are relatively higher (mean of 20 to 35 NTU) than those in the upper reaches of the SJR (mean of 1-5 NTU). The PEIS/R refers to studies by Newcombe and Jensen (1996) and Bash et al. (2001) to support the assumption that the relatively higher levels of turbidity in the lower reaches of the SJR could result in potentially significant impacts on fish through disruption of a variety of behavioral and physiological processes. However, both these studies focus on salmonids, which are typically far more sensitive to sediment and turbidity than the non-salmonid fishes (Brown 2000) targeted for impact assessment in the lower reaches.

EC1-213

The PEIS/R then goes on to state that (Page 5-69, Line 21-26), "….although the affected special-status species in Reaches 4 and 5 have been found to be relatively tolerant to high turbidity (Brown 2000), existing water quality impairments may be related to contaminant sorption on suspended sediments, which can cause a range of impacts ranging from olfactory and neurological impairment to direct toxicity (Moore and Waring 1996). Therefore, these impacts would be potentially significant." There are two issues with this approach; (1) potential impacts from contaminants absorbed on to sediments is a pollutant discharge impact that is already covered in FSH-2, and not a sediment/turbidity impact per se, and (2) the Moore and Waring (1996) study that is cited relates to contaminant effects on salmonids (specifically, Atlantic salmon parr), which are far more sensitive to contaminants than the non-salmonid species in the lower reaches (Brown 2000). Therefore, there is no current basis in the PEIS/R to support the determination of "potentially significant" impacts from changes in sediment discharge and turbidity in the SJR between Friant Dam and Merced River under the No-Action alternative. Additional data is needed to adequately support this impact determination.

EC1-214

Page 5-90. Line 14. Impact FSH-22 for alternatives 1A-C2 regarding changes in water temperature and dissolved oxygen concentrations between Friant Dam and the Merced River is discussed at the project level. There is no discussion of temperature impacts on salmonids. Discussion of temperature is cut off at Year 2030 and fails to take into account the substantial warming predicted to occur by Year 2041. This is an incomplete analysis.

EC1-215

EC1-215 cont'd — Further, the draft simply assumes that restoring cooler water to currently dry or low-flow areas of the San Joaquin River within the Restoration Area would have a uniformly beneficial effect. As discussed above, the draft fails to take into consideration the creation of additional habitat that could attract salmonids into areas where heavy predation will occur. Any expansion of the wetted area will provide habitat for predation. This is not a beneficial impact.

EC1-216 — Page 5-91. Line 1. Impact FSH-23, regarding changes in pollutant discharges between Friant Dam and the Merced River, is discussed at the project level. Omitted from this discussion is the impact that occurred during WY 2010, when Interim Flows were mismanaged in conjunction with inflow from the Delta Mendota Canal. As a result of the mismanagement, a substantial degradation in water quality occurred due to normal water and agricultural practices. A discussion of this impact and mitigation measures should be set forth.

EC1-217 — Page 5-91. Lines 1-24. Impact FSH-23 (Alternatives A1 through C2): Changes in Pollutant Discharge and Mobilization in the San Joaquin River Between Friant Dam and the Merced River – Project level

Page 5-91. Lines 10-13. It is stated in the PEIS/R that while the additional water provided by Interim and Restoration flows is expected to dilute the existing level of agriculture-derived pollutants in the SJR, it is not expected to reduce pollutants to a level that would significantly improve conditions for fish species. Since the target of this impact assessment is representative special-status and game fish, why is this impact then listed as "beneficial?" Rather, a less than significant impact determination should be sufficient in this case.

EC1-218a — Page 5-91. Lines 25-26. Further, it is stated that the Interim and Restoration flows are not expected to impact the SJR by mobilizing pollutants, but no basis is provided to support this statement, except that these flows could be recaptured at the East Bear Creek Unit (EBCU) of the San Luis NWR. It is likely these added flows could be sufficient to mobilize pollutants associated with sediment in the river before these flows are recaptured at the EBCU.

EC1-218b — For the reasons stated above, this impact needs to be re-evaluated and more evidence is needed as suggested above to support a determination of "less than significant and beneficial" impact.

EC1-219 — Page 5-92. Line 22. Impact FSH-25, concerning changes in fish habitat conditions between Friant Dam and the Merced River, is discussed at the project level. The draft concludes that improved habitat conditions would benefit all representative fish species and increase fish abundance and survival. Since the increased populations and survival of predators would occur along with any other fisheries, no analysis is set forth regarding the adverse impacts that such increased predation will have.

EC1-220 — Page 5-93. Line 1. The draft notes that continuous base flow in the river will provide habitat connectivity and allow for the increased migration of Sacramento splittail and striped bass. Increasing the bass population will increase predation. There is no discussion of this effect.

EC1-221 — Page 5-94. Line 21. The draft notes that several diversion facilities may be used to recapture Restoration Flows, including recapture at the Mendota Pool. If Reclamation uses a recapture program at the Mendota Pool by providing Restoration Flows to the Exchange Contractors in exchange for reducing

EC1-221 cont'd

deliveries from the DMC, will this violate the contract with the Friant Contractors that states that deliveries of CVP supplies to the Exchange Contractors down the San Joaquin River will not be made unless certain factors exist such that water from the Sacramento Valley cannot be delivered via the DMC to the Exchange Contractors? Please explain.

EC1-222

Page 5-94. Line 38. Impact FSH-27 briefly discusses changes in predation levels between Friant Dam and the Merced River at the project level. The draft concedes that no quantification of assessment of predation has been conducted. Yet, the draft concludes that impacts would be less than significant and beneficial. The draft notes that there are large populations of non-native fish in the Restoration Area and that "predation pressures on representative special-status fish species and other native fishes are believed to be considerable under current conditions." Then, the draft concludes, without data, that providing additional flows that would shift habitat conditions away from the warmer and slower water habitat favored by non-native predators would increase habitat suitability for native species, "in effect, moving non-native predatory fish further downstream." While this is a theory, the additional flow and habitat could simply increase the bass population. Creating additional habitat for these non-native predators downstream puts them exactly into the locations where salmonids must migrate in order to move up and down the San Joaquin River. The draft fails to identify actions that will effectively reduce predation. The discussion of changes in predation levels is inadequate.

EC1-223a

Page 5-94. Lines 38-42. Page 5-95. Lines 1-14. Impact FSH-27 (Alternatives A1 through C2): Changes in Predation Levels in the San Joaquin River Between Friant Dam and the Merced River – Project level

The PEIS/R states that, "Interim and Restoration flows would reduce predation by nonnative fishes in the Restoration Area by creating in-channel conditions that favor native fish species over nonnative species. This impact would be less than significant and beneficial."

We disagree with this assessment. Implementation of Interim and Restoration flows in dry through wet years would establish perennial flows and increase in habitat for both native (e.g., hardhead, Sacramento splittail, rainbow trout) and nonnative fish species (largemouth bass, smallmouth bass, spotted bass and Striped bass) in the Restoration Area. Large populations of nonnative fish predators already exist in the lower reaches of the SJR (CDFG 2007), and their populations can be expected to increase with implementation of Interim and Restoration flows, potentially resulting in increasing predation pressures on native special-status species (e.g., larval and juvenile hardhead, Sacramento splittail). Although these nonnative fish species (e.g., largemouth bass) favor warmer temperatures and slower flows than native fish, they generally can tolerate a wider range of environmental conditions than native fish (Moyle 2002), and can be found throughout the Restoration Area, including Reach 1 (San Joaquin River Restoration Program 2010). We agree that increased flows in Reach 1 could result in cooler water temperatures that potentially could favor native fish over predators such as largemouth bass. Yet, largemouth bass can potentially inhabit gravel mining pits in Reach 1 where lower water velocities and warmer temperatures provide these fish with ideal habitat (McBain and Thrush 2002). Furthermore, based on the SJR5Q model results, average water temperatures in the lower Reaches (4 & 5) would be only 1 to 2°F lower than the No-Action Alternative during spring and early summer, and similar to the No-Action Alternative during other months (PEIS/R Appendix H, "Modeling). This marginal drop in average water temperatures in the lower reaches is unlikely

EC1-223a cont'd

to shift the balance from a fish community dominated by nonnative predators to native fish. Rather, a perennially wetted channel under Interim and Restoration flows could instead promote the colonization of areas where other nonnative predatory fish are currently not as abundant (e.g., Reach 1). Smallmouth bass, for example, are more stream-oriented than other bass and prefer cooler waters than most other nonnative fish species (Brown 2000); this nonnative predator could potentially become more abundant in Reach 1 with implementation of Interim and Restoration flows (Fishbio Environmental 2011), increasing the risk of predation for native special-status fishes. Based on these reasons, we disagree with the impact assessment of "less than significant and beneficial" in this PEIS/R and contend that predation impacts could potentially be significant.

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Chapter 6. Vegetation and Wildlife

EC1-224

Page 6-51. Lines 7-12. While it is true that there is uncertainty regarding the future implementation of the USACE policy regarding vegetation on levees, the USACE policy does reflect current policy and should not be dismissed as "too speculative for meaningful consideration." The requirement for the restoration project to comply with the current policy could significantly affect vegetation and wildlife and influence the potential success of the restoration project. We recommend that the likely consequences of implementation of the current vegetation policy on vegetation and wildlife and restoration project success be disclosed in the PEIS to inform the public and decision makers on the full range of potential impacts of the proposed action.

EC1-225

Page 6-57. Line 27. The Riparian Habitat Mitigation and Monitoring Plan (RHMMP) required under Conservation Measure RHSNC-2 is intended to guide the development and implementation of actions to compensate for impacts to riparian, wetland, and other sensitive communities. The Plan should identify potential mitigation areas under public ownership to confirm the availability of land to meet the mitigation requirements. If the Plan anticipates the acquisition of any private land for mitigation purposes, it should clarify that it would be on a willing seller basis. The Plan also should include a description of how access to monitoring sites across private land will be achieved and how impacts would be mitigated.

EC1-226

Page 6-61. Lines 35-39. Page 6-62. Lines 1-26. Thirty five sensitive plant species are acknowledged as occurring or having the potential to occur in the Restoration Area. Compensatory mitigations for program-level impacts to these species are developed by Reclamation in the Chapter 2.0 of the draft PEIS/R. We are concerned that sensitive resources may develop outside of the Restoration Area due to restoration actions, and that these resources may be consequently impacted during the implementation of otherwise lawful activities on adjacent lands. Program-level indemnities must be put in place to protect land owners from potential prohibitions and prosecutions related to incidental impacts (including "take") to sensitive

EC1-226 cont'd resources during otherwise lawful activities. This same concern applies to all action alternatives, to sensitive wildlife species with the potential to associate with existing or created habitat areas, and to both program- and project-level actions.

EC1-227 Page 6-65. Table 6-6. Table 6-6 indicates that Settlement actions may result in long-term beneficial effects to riparian and marsh habitats that would benefit birds breeding in emergent marsh. The Draft PEIS/R, however, does not assess the potential for third party impacts resulting from an increased production of birds (e.g., blackbirds) that are associated with crop depredation. We recommend that the PEIS include an assessment of the potential for these impacts and a description of the methods that would be used to mitigate any anticipated impacts.

Chapter 10. Geology and Soils.

EC1-228 Page 10-20. Line 3. The statement in this section reports that the soils in the lower portion of Reach 2b and Reach 3 contain a selenium burden of 0.14 to 0.36 of ppm (14 to 36 ppb where the water quality objective is 5 ppb) in the top 12 inches of soil. This statement is not supported by any factual information and is inferred from a USGS report cited in the SJVDP 1990 report using a statistical analysis. The inference of the findings is the soils in this area have the potential to impact surface runoff, ponding or the quality of subsurface drainage. This finding poses the threat of inverse condemnation of the properties involved and a diminution of property values when the Program and Projects need to use the property for implementation. This finding is unacceptable. The selenium burden in the soils of these areas needs testing to confirm any such conditions before including such findings in this or any other document. The soils in the 2B and 3 eastside areas are sands and sandy loams (California Soil Resources Lab) that have been irrigated for over 100 years. While over-wash from the source, the Panoche-Silver Creek Watershed, may have left a residual during some ancient event, the presence would have been in a natural soil pedon, not irrigated areas. The source contained predominately organic selenium from ancient sea bed diatoms trapped in the sedimentary geology of the Coast Range and the organic forms of selenium are soluble and easily removed. Irrigation for over one hundred years has removed (see testing of shallow water in CCC and CCID) any vestiges from these soil profiles. In the case of the sedimentary soils of Reach 3 westside, the areas that may still have selenium are those that have been refreshed by the flood events of Panoche-Silver Creek which is a relatively small geographic area near Mendota. Soil testing must be conducted to support any conjecture about soil selenium content and its implications.

EC1-229 Page 10-21. Line 4. Same comments as above.

Chapter 11. Flood Management

EC1-230 General Comment.

There is a lack of focus on the critical flood issues in the restoration area and on the background and operations of the Lower San Joaquin Levee District (LSJLD). Many of the descriptions of flood operations and facilities are inaccurate.

EC1-231 Page 11-6. Lines 23 - 24. Needs to include a description of the LSJLD and the significance of its flood operations in the study area between Gravelly Ford and the Merced River. The LSJLD was created in

EC1-231 cont'd: 1955 and is responsible for the maintenance and operation of the project flood control facilities. LSJLD, in accordance with its agreement with the State Reclamation Board, is obligated to maintain not only the bypasses, but the channel of the San Joaquin River in the Project Area, in a condition where the channel will carry specified flood flows in accordance with the maximum benefits for flood protection. This obligation may be in direct conflict with some of the proposed restoration actions, including those that encourage vegetation growth in and along the river or bypass channels.

EC1-232: Page 11-9. Lines 24-25. Mendota Pool does not function as a reservoir and has no operable flood or water conservation storage.

EC1-233: Page 11-9. Lines 31-34. Mendota Pool does not fill with sediment and there is little observed evidence of sedimentation based on inspections that are carried out every two years when the pool is dewatered and the dam is inspected.

EC1-234: Page 11-9. Lines 40-41. Delta-Mendota Canal water flows into Mendota Pool and then through Mendota Dam and down Reach 3 before being diverted into the Arroyo Canal at Sack Dam.

EC1-235: Page 11-9. Lines 41-42. Flows greater than 600 cfs may be diverted into the Arroyo Canal during the irrigation season.

EC1-236: Page 11-10. Lines 1-2. Flood flows are not diverted in the Arroyo Canal except for irrigation purposes. Flood flows generally pass the canal and continue downstream.

EC1-237: Page 11-10. Line 10. The draft needs to define what it means by "excess water". Further, the draft needs to define and better explain that Kings River flows have priority over San Joaquin River flows in Mendota Pool during flood events.

EC1-238: Page 11-10. Lines 15-16. The text should clarify that the design capacity of the James Bypass/Fresno Slough is 4,750 cfs according to Army Corp of Engineer Flood Diagrams. The draft also needs to explain that per current flood control manual operations, the Kings River conveys up to the first 4,750 cfs of flow into the San Joaquin River and then up to the next 4,750 cfs is diverted to the Tulare Lake Bed. Above a Kings River flood flow of 9,500 cfs, the remaining flow is split 50/50 between the San Joaquin River and the Tulare Lake Bed. Kings River flood flows have priority over Restoration Flows released from Friant Dam into the San Joaquin River. The operation of the Chowchilla Bifurcation Structure is coordinated with the amount of Kings River flood flows entering the San Joaquin River system via Fresno Slough, if San Joaquin River flood flows are being released from Friant Dam. The volume of San Joaquin River flow routed into the bypass system is increased as the amount of Kings River flood flows entering the San Joaquin River increases. Under high Kings River flow conditions, all flows in the San Joaquin River may be routed into the bypass system at the Chowchilla Bifurcation Structure.

EC1-239: Page 11-13. Lines 16-17. The levees constructed in the restoration area were constructed by the State as noted on page 11-6 line 13.

EC1-240: Page 11-13. Lines 32-37. The draft needs to acknowledge that there has been significant flood damage caused by seepage at flows below accepted design capacities. There has also been a significant loss

EC1-240 cont'd of the original design flow capacity caused by subsidence, sand build up, and vegetation growth in the channels.

EC1-241 Page 11-16. Lines 37-38. The sentence should note that Table 11-1 provides original design capacities and should reference the source of the design capacity information. Many of these capacities have decreased over time due to sedimentation, subsidence, and vegetation growth. For example the current capacity of Reach 2B is estimated to be about 1300 cfs.

EC1-242 Page 11-17. Line 3. Table 11-1. Add a note stating that the actual Reach 2B capacity has been reduced to 1300 cfs.

EC1-243 Page 11-17. Line 3. Table 11-1. Add a note stating that the actual Reach 4B1 capacity has been reduced to 0 - 200 cfs.

EC1-244 Page 11-17. Table 11-1. Note 1 indicates "Summarized from results of one-dimensional HEC-RAS hydraulic modeling described in Appendix H, "Modeling." Table should be based on and reference actual design capacities published in DWR or USACE flood flow capacity diagrams. HEC-RAS modeling has no relevance to design capacities.

EC1-245 Page 11-18. Line 38. Should read: Sand Slough Control Structure "was designed" to maintain this design discharge.

EC1-246 Page 11-23. Lines 11-16. The description of the LSJLD is inadequate considering the critical role and health and safety responsibilities the District has in the study area. The description should include the following text:

> "The LSJLD was created in 1955 and is responsible for the maintenance and operation of the project flood control facilities. LSJLD, in accordance with its agreement with the State Reclamation Board, is obligated to maintain not only the bypasses, but the channel of the San Joaquin River in the project area, in a condition where the channel will carry specified flood flows in accordance with the maximum benefits for flood protection. This obligation may be in direct conflict with some of the proposed restoration actions, including those that encourage vegetation growth in and along the river or bypass channels. The LSJLD is responsible for the project levees, bifurcation structures, control structures, and bypass channels that route high flows out of the San Joaquin River into the bypass system, moderating flows in Reaches 2B, 3, 4, and 5. Major facilities in the San Joaquin River Flood Control Project include the Chowchilla Bifurcation Structure, Chowchilla Bypass, Eastside Bypass Control Structure, Eastside Bypass, Mariposa Bypass Structure, and Mariposa Bypass. The LSJLD is funded by property tax assessments on lands within the LSJLD boundaries that receive flood control benefits. As a result of conversion of lands to state and federal ownership (primarily for wildlife areas), the LSJLD is facing a disappearing tax base at a time when O&M costs are rising."

EC1-247 Page 11-27. Line 1. An impact assessment methodology needs to be included or be preceded by a clear description of flood control operations under the Alternatives. The draft PEIS/R should identify if the

EC1-247 cont'd proposed Mendota Bypass will be used for flood control purposes. Re-plumbing of the system will allow alternate flow paths that will impact flood operations. If the Mendota Bypass is constructed, a significant increase in the amount of flood flow that could potentially enter Reach 3. Since increases in flood risk are being evaluated at the project level in this document, a detailed description of potential changes to flood operations and impacts must be included. In addition, Kings River flood flows from Fresno Slough must also be considered in the flood evaluation.

EC1-248 Page 11-27. Lines 2-3. These models have no ability to simulate the true physical processes that will impact flood operations and maintenance in the restoration area. These models do not have the ability to evaluate how more frequent high flows and flow levels will saturate and compromise levee integrity over time. Since minimizing flood risk is being evaluated at the project level, a more rigorous analysis of the impacts of increased flow frequency and flow levels should be provided in the draft PEIS/R. The evaluation of redirected flood impacts cannot simply be based on a theoretical modeling exercise using outdated fragility curves.

EC1-249 Page 11-27. Lines 6-7. The draft PEIS/R should include information regarding the calibration and prior usage of these modeling tools that make them appropriate for use in this impact assessment.

EC1-250 Page 11-27. Lines 12-14. The draft should acknowledge that the UNET model can only provide a theoretical estimate of the non-damaging flow capacities in Reaches 2A,2B, 3, 4A, and 4B. There are many other physical parameters that must be considered in the evaluation of non-damaging flow capacity that are not addressed in this draft.

EC1-251 Page 11-27. Lines 15-18 and Page 28. Lines 1-8. The impact assessment methodology is theoretical in nature and has very limited applicability to the actual physical river system in the restoration area. The document needs to describe the limitations of this method and its application to the San Joaquin River's highly complex and flow capacity constrained flood management system.

EC1-252 Page 11-29. Lines 13-14. How does the impact assessment methodology provide a meaningful assessment of increased risk due to underseepage, through seepage, or slope stability?

EC1-253 Page 11-27. Lines 15-16. How does the impact assessment methodology provide a meaningful assessment of increased risk due to erosion or associated landside slop stability mechanisms?

EC1-254 Page 11-31. Lines 40-41. The preceding text does not adequately inform the reader what is meant by the "lack of recent and consistent information regarding channel and levee conditions in the Restoration Area." Preceding sections need to clearly describe these data issues for the reader.

EC1-255 Page 11-35. Lines 13-16. How will redirected impacts to Reaches 3 and 4A be mitigated?

EC1-256 Page 11-35. Lines 21-24. Localized backwater and redirection effects can cause significant impacts to local flood and water operations. LSJLD and third party interests need to be included in site-specific studies and designs to ensure that all program-level actions are appropriately refined to eliminate any potential impacts.

EC1-257 Page 11-35. Lines 29-32. Increased vegetation and sediment deposition can cause significant impacts to local flood and water system operations including increased O&M costs. LSJLD and third party interests need to be included in site-specific studies and designs to ensure that levee and channel improvements are appropriately designed to eliminate any potential impacts. Document does not adequately describe vegetation management response actions and how these actions will be funded.

EC1-258 Page 11-35. Lines 30-32. The increased O&M costs to manage increased vegetation growth and sediment deposition can cause significant financial impacts to local flood and water system operations. A long-term financial agreement must be in place before this action can be considered less than significant.

EC1-259 Page 11-41. Lines 31-35. The project level impact and mitigation section must specifically identify and evaluate all potential land use related inundation and anticipated seepage-related impacts to all existing and proposed land uses such as the City of Mendota's and City of Firebaugh's well fields and all public facilities and parks (including total acreage to be impacted), including how such impacts will be mitigated. The Firebaugh City Manager reports that they have to monitor levees at flows above 4,000 cfs and have to sandbag if flows approach 4,200 cfs. The city also experiences a rise in local groundwater levels that stops percolation at the waste water treatment plant settling ponds, requires pumping of construction trenches, saturates embankments and levees, and floods recreation facilities. All of these impacts must be addressed in the Draft PEIS/R since minimizing flood risk is being evaluated at the project level for NEPA/CEQA compliance.

EC1-260 Page 11-43. Lines 7-8. The actions included in Alternatives A1 through C2 should "prevent" or avoid potential substantial increases in flood risk which might otherwise occur. A "reduction" in flood risk is only acceptable if the risk is reduced to the No-Action level.

EC1-261 Page 11-43. Lines 15. Consistent with comments on Chapter 2, the proposed Channel Capacity Advisory Group must have a clear authorized purpose and there must be agreed upon procedures, protocols, and performance standards in place to guide the review and response to comments provided by the group. There must be a formal process for Reclamation to respond to and resolve comments provided by the group.

EC1-262 Page 11-43. Line 17. Consistent with comments on Chapter 2, the use of one-dimensional HEC-RAS hydraulic modeling described in Appendix I provides only a theoretical estimate of in-channel flow capacity and does not incorporate enough information to determine actual then-existing in-channel flow capacities.

EC1-263 Page 11-43. Lines 20-22. The evaluation of the potential performance of the levees will require, among other things, evaluation of the composition of the levees and foundation materials, analysis of several modes of potential slope stability failure, as well as evaluation of seepage through and under the levees. These analyses cannot be addressed with a single factor of safety requirement. The use of the Factor of Safety of 1.4 or greater is inadequate for determination of safe limiting Interim and Restoration flows. Considering the potential for differences in interpretation of criteria, it is recommended that a more detailed and site-specific set of design criteria, considering all potential failure modes and specific USACE District requirements, be established.

EC1-264 Page 11-43. Lines 26-27. There may be locations along the river in the Restoration Area where the channel invert elevation is higher than the elevation of the landside levee toe. Therefore, this criteria may not provide a minimum level of protection in all cases.

EC1-265 Page 11-43. Lines 28-30. As noted previously, the evaluation of the potential performance of the levees will require, among other things, evaluation of the composition of the levees and foundation materials, analysis of several modes of potential slope stability failure, as well as evaluation of seepage through and under the levees. Limiting Interim and Restoration Flows to levels that correspond to a single Factor of Safety of 1.4 or higher does not address all of these performance measures. Considering the potential for differences in interpretation of criteria, it is recommended that a more detailed and site-specific set of design criteria, considering all potential failure modes and specific USACE District requirements, be established.

EC1-266 Page 11-43. Lines 30-34. The USACE Factor of Safety of 1.4 cited in Chapter 2 does not provide a minimum Factor of Safety associated with all the failure modes contributing to levee erosion and seepage impacts.

EC1-267 Page 11-44. Lines 19-23. Figure 11-18 shows a particular hydrologic sequence when peak snow melt releases are avoided, but there may be many other hydrologic sequences where peak snow melt releases are not avoided and levees saturated by preceding Restoration flows may be more susceptible to failure during high flood flow releases. This impact may not be less than significant in many cases.

EC1-268 Page 11-44. Lines 24-29. Peak Interim and Restoration Flows in April-June that occur after major rain-flood events may contribute to additional levee erosion, seepage, and exacerbate existing problems or delay required maintenance. This impact may not be less than significant in many cases.

EC1-269 Page 11-48. Lines 9-12. Immediate and long-term actions associated with maintaining channel capacities are outlined in PEIS/R Appendix D (Physical Monitoring and Management Plan), chapters 4 and 5. The Draft PEIS/R needs to provide a more detailed description of how and when these actions would be implemented.

EC1-270 Page 11-48. Lines 19-20. Consistent with comments on Chapter 2, the Invasive Vegetation Monitoring and Management Plan acknowledges the importance of controlling invasive riparian species, but it is unclear how the program can effectively identify and control invasive plant species. The Draft PEIS/R should include an analysis of the feasibility of implementing an invasive plant monitoring and control program. The Draft PEIS/R should describe the potential impacts on vegetation and wildlife, and restoration project success within the context of ongoing control measures or diminished habitat functions resulting from invasive plant species.

EC1-271 Page 11-49. Lines 1-4. Consistent with previous comments, the measures to reduce flood risk described in Chapter 2 need to be more specific and thorough. The three measures that Reclamation proposes to implement to collectively avoid a potentially significant increase in the risk of flood damage, or levee failure due to underseepage, throughseepage, erosion, or landside slope stability need to be further developed to avoid potential increases in flood risk. As discussed previously, the safe performance of the levees cannot be expressed by a single USACE factor of safety requirement. A more detailed and site specific summary of the criteria, considering all potential failure modes, should be established.

EC1-272 Page 11-49. Lines 36-42. Reclamation intends to enter into a financial agreement to assist LSJLD in adapting to changes in O&M activities. Reclamation must provide financial support for increased O&M for the life of the project. Also, there needs to be financial compensation for lost tax assessment revenue caused by purchase of private lands by Reclamation for restoration purposes. The restoration goals are in conflict with LSJLD maintenance obligations. The less than significant rating is subject to development of an adequate financial agreement.

EC1-273 Page 11-50. Lines 2-7. The term of the "long-term agreement" must be identified and funding secured before Impact FLD-7 can be dismissed as less than significant.

Chapter 12. Hydrology - Groundwater

EC1-274 Page 12-35. Figures 12 -16 and 17. These figures are incomplete or missing and would provide important information to assist reviewers in understanding the impacts of seepage to neighboring properties in the Program Area.

EC1-275 Page 12-37. Line 13. The presentation in this section lacks perspective on the relative contributions of recharge. The permeability of the alluvial sands and sandy loams in the eastern San Joaquin Valley are in the order of 1 x 10-3 cm/sec while the clay beds (A through E or Corcoran Clay) are in the order of 1 x 10-8 to 10-12 cm/sec. That magnitude of difference of 1 billion units is very significant.

EC1-276 Page 12-46. Line 35. Uranium is present in many groundwater areas of the Valley and poses a significant issue for drinking water and hence human health, but is not mentioned.

Chapter 13. Hydrology – Surface Water Supplies and Facilities Operations

EC1-277a Page 13-71. Table 13-51 has a program "action" in Reach 4B1 that includes a flow goal of 4500 cfs and integrated flood plain management. Which lands are designated for integrated flood plain management and where have the environmental consequences of any intentional flooding been described? If the land is

EC1-277b currently privately held, the impact of such a decision has not been incorporated in the land use and socioeconomic impact section of the draft PEIS/R.

Chapter 14. Hydrology – Surface Water Quality

EC1-278 Page 14-12 – Table 14-3. Same comment as to Page 13-71. Table 13-51

Chapter 16. Land Use Planning and Agricultural Resources

EC1-279 Page 16-1. Line 20. The width of the restoration area of 1500' from the river centerline outward from both banks is not wide enough to encompass the areas where "restoration actions could affect existing land uses or agricultural resources" as further defined on lines 21 and 22. CCID has submitted monitoring well data gathered when 2010 and 2011 Interim Flows and flood flows were present in the river. The impacted area extended about 3 miles west of the centerline of the river in Reaches 3 and 4A.

EC1-280 Page 16-1. Line 25. Even though urban land uses only account for a relatively small percentage of the land used along the San Joaquin River, the area in Reach 3 adjacent to the City of Firebaugh is an urban

EC1-280 cont'd area. In some cases, this area adjacent to the City of Firebaugh will pose the most limiting maximum flow hydrograph issues due to public safety relative to a potential levee breach, impacts to seepage into the City's storm and sanitary sewer system, increased construction costs, etc…

EC1-281 Page 16-2. Lines 3 to 8. There are and will be notable exceptions to whether the State has fee or easement interest in the remaining reaches. Such exceptions include, but are not limited, to the State having sold its interest to Miller and Lux without any exception, or where lands reside within one of the Mexican or Spanish land grants over which the State has no jurisdiction.

EC1-282 Page 16-7. Line 7. The public park, adjacent public multi use facilities, sanitary sewer disposal land and facilities, are publicly owned by the City of Firebaugh. In addition, there are canals on each side of the river which are parallel with, adjacent to, and share the bank of the San Joaquin River in Reach 3. The easterly Columbia Canal Company facility is privately owned, the Poso Canal on the west side is owned by CCID, a public agency.

EC1-283 Page 16-7. Lines 24 to 29. The Poso Canal and Riverside Canal are parallel with and adjacent to the river on the west side, all along Reach 4A. They are owned by CCID a public agency.

EC1-284 Page 16-8. Line 12. The Chowchilla Bypass is not a permissible route for restoration flows.

EC1-285 Page 16-30. Line 39. Impacts to important farmlands, which are identified as significant and unavoidable, must be mitigated as specified in Section 10004(d)(2) of the San Joaquin River Restoration Settlement Act. Unlike the setback levee footprint impacts, proper selection of borrow areas can be conducted to minimize impacts to important farmlands. Accordingly, add the following text: "In general, every effort will be taken to ensure borrow areas are located so as not to impact important farmland unless agreed upon by willing landowners and mitigated appropriately."

EC1-286a Page 16-31. While it is agreed that future development will likely result in additional impacts (some being significant and potentially unavoidable), it is unclear what Reclamation and DWR are identifying as the baseline condition under both NEPA for the No-Action Alternative? What projects were assumed to occur, and what were the assumptions that distinguish the No-Action Alternative baseline from the approach/assumptions used for the cumulative impacts assessment?

EC1-286b Using the same logic as was used for likely impacts to important farmland, it is unclear how the conclusion was reached that conversion of riparian forest to non-forest uses also will not likely occur?

EC1-287 Page 16-34. Line 1. As Reclamation is aware, continued coordination with landowners and water districts/companies is essential to the successful implementation of the entire San Joaquin River Restoration Program. Accordingly, add new first bullet stating the following: "Limit temporary and long-term impacts to important farmland associated with levee setbacks through coordination with applicable landowners."

EC1-288 Page 16-34. Line 1. After the word "excavation" add the following text: "impacts to important farmland by avoiding such lands to the extent possible as well as"

EC1-289 Page 16-34. Line 21. Add "in close coordination with affected land owners to maximize the potential for such lands to be used by impacted land owners in the long-term. If such lands cannot be obtained, land owners will be paid fair market value for their land, and acquired easements will" after "use)" and strike "to be."

EC1-290 Page 16-34. Line 29. Add "in close coordination with all applicable land owners" after the word "purposes".

EC1-291 Page 16-34. Line 33. Add "in close coordination with all applicable land owners" after the word "impacts"

EC1-292 Page 16-35. Line 4. Add "in close coordination with all applicable land owners" after the word "measures".

EC1-293 Page 16-40. Lines 24 – 35. All potential land use related impacts need to be identified. Inundation and anticipated seepage-related impacts to all existing and proposed land uses such as the City of Mendota's and City of Firebaugh's well fields and all public facilities and parks (including total acreage to be impacted) needs to be specifically identified and how such impacts will be mitigated. The City Manager reports that they have to monitor levees at flows above 4,000 cfs and have to sandbag if flows approach 4,200 cfs. The city also experiences a rise in local groundwater levels that stops percolation at the waste water treatment plan settling ponds, requires pumping of construction trenches, saturates embankments and levees, and floods recreation facilities. All of these impacts must be addressed in the document since minimizing flood risk is being evaluated at the project level for NEPA/CEQA compliance.

EC1-294 Page 16-40. Line 40. How can the additional hundreds of travelled miles due to severed cross access be considered less than significant?

EC1-295 Page 16-41. Line 20. The discussion of impacts must include an estimated total acreage of impacts rather than simply stating "at some locations" as currently identified in Line 3. The expert testimony of Dr. Michael D. Harvey submitted August 18, 2005 identified a potential impact to approximately 1,900 acres associated with Reach 2B, 412 acres for the proposed bypass channel around Mendota Dam, and an additional 2,518 associated with Reach 4B. The only reference found to the amount of potentially impacted farmland acreage is on page 16-45 under Impact LUP-8 (Alternatives A1 through C2): Substantial Diminishment of Agricultural Land Resource Quality and Importance Because of Altered Water Deliveries – Project-Level, which claims "implementing Alternatives A1 through C2 would on average reduce irrigated acreages by less than 1,000 acres…" What is the basis of this number?

EC1-296 Page 16-41. Line 36. As Reclamation is aware, water districts and landowners have been participating closely with Reclamation as part of the Seepage and Conveyance Technical Feedback Group to minimize potential seepage impacts in both the short and long term. It is critical that this group remain engaged and build on the mutual understanding of both known and potential areas of seepage concern, including accounting for potential future changes in crop patterns (e.g., conversion to orchard crops with associated deeper root zones than most field crops). Accordingly, add the following: "Reclamation has been working closely with water districts and participating landowners as part of the Seepage and Conveyance

EC1-296 cont'd Technical Feedback Group to minimize potential seepage-related impacts in the short and long term." after the word "land."

EC1-297 Page 16-41. Line 41. As discussed with Reclamation as part of the Seepage and Conveyance Technical Feedback Group, landowners continue to be concerned about the potential for seepage-related impacts to future crops (e.g. orchards) that generally have a deeper root zone than current row crops. As such, the following should be added: "(both current and future including the potential for additional orchard crops)" after the word "practices."

EC1-298 Page 16-42. Lines 4 – 28. Include potential to install slurry or cut-off walls as a method of limiting seepage impacts where applicable and agreed to by adjacent landowners.

EC1-299 Page 16-42. Line 6. Add "actions implemented as part of the Physical Monitoring and Management Plan/seepage monitoring and management plan," after the word "by"

EC1-300 Page 16-42. Line 11. Add "will work closely with the Seepage and Conveyance Technical Feedback Group to" after the word "will"

EC1-301 Page 16-45. Lines 20 – 21. The Draft PEIS/R claims "implementing Alternatives A1 through C2 would on average reduce irrigated acreages by less than 1,000 acres…" What is the basis of this number? Is the claimed 1000-acre impact only associated with reduced water deliveries?

Chapter 20. Public Health and Hazardous Materials

EC1-302 Page 20-1. There is no mention of the hazards associated with or the potential impacts to the sewage treatment facilities adjacent to the San Joaquin River in Mendota and Firebaugh. Should there be a levee failure, flood event or vandalism, there is a likelihood of human pathogens entering the Program and Project areas. The re-connection of the River below Sack Dam adds a new element of exposure to humans, especially recreationists, as well as animals susceptible to enteric disease-causing organisms. Similarly, there is no mention of septic tanks in the Project areas that could fail as a result of seepage and high water tables or by surface inundation of the facilities.

Chapter 22. Socioeconomics

EC1-303 General Comment. The Socioeconomics chapter as currently presented is very broad in its analysis. We understand that this is necessitated by the fact that this is a programmatic EIS/R. However, for the project specific EIS/R, please provide specific information on: (1) actual agricultural acreages lost, (2) identify, to the extent possible, the location of these lost acres, (3) crops types grown on these acres, (4) value of crops currently grown, (5) identify potential replacement crops in areas where agricultural land will likely be lost temporarily due to construction but where due to changes in either groundwater, drainage, or other factors the previous cropping type is no longer feasible.

EC1-304 Page 22-52. Lines 2-4. Although the section discusses the potential impacts from reductions in agricultural value during construction, this is more of a sensitivity analysis and no actual changes in acreages are presented in this chapter. Chapter 16, Land Use, only talks about a potential loss of more than 1,000

EC1-304 cont'd

irrigated acres. However, the discussion does not include the location of these lost acres. Further, in a recent public session, Reclamation mentioned there could be as much as 8,000 acres taken out of production. What is Reclamation's best estimate of acreage to be taken out of production at this point and for what purposes?

Chapter 24. Utilities and Service Systems

EC1-305

Page 24-11 and 13. UTL 5 and 13 impacts assessment. The draft PEIS/R proposes that the needs for increased emergency services are a less than significant environmental impact. We disagree; the Restoration areas will likely be an attractive nuisance for many more visitors with their associated accidents and or incursions onto private property. Both Sheriffs services and fire or medical emergency equipment will be undoubtedly called upon to respond to the increased visitor activities as a result of the implementation of the Program and Projects. The impact should be elevated to "significant."

Chapter 28. Consultation, Coordination and Compliance

EC1-306

The Chapter provides a programmatic overview of the permitting requirements of the project, but does not provide any detail for the specific projects within the program. The DEIS/R should identify the mechanisms to involve stakeholders in the permitting process. Third-party interests should be identified and incorporated into the permitting process during the following permitting review processes:

- USACE 404 Public Interest Review- Third-party interests should be invited to attend the USACE scoping for any Individual Permit review.
- CVFPB Encroachment Permit- USACE review: Third-party interests should be contacted prior to USACE review of any CVFPB encroachment permit approval by the USACE to ensure that hydraulic analysis includes consideration of impacts to third-party interests.
- California State Lands Commission – Land Lease: Third-party interests should be involved in any decision or determination made by the State Lands Commission.

EC1-307

The Chapter does not include a significant permitting discussion of the San Joaquin Air Pollution Control District or the Indirect Source Review (ISR). ISR is mentioned in the Air Quality Section (Chapter 4.0) as a mitigation measure. There is an assumption that the ISR (Rule 9510) will be utilized to reduce PM10 and NOx, but there is no discussion of the relative cost or challenges associated with the ISR process on a program of this magnitude.

EC1-308

Page 28-30. Lines 1-18. The California State Lands Commission ("SLC") discussion does not adequately describe the challenges associated with the State Lands Commission or their jurisdiction over the San Joaquin River channel. The discussion on page 28-30, line 11, describes the river as "navigable in fact", but fails to acknowledge that numerous issues, property disputes, and other factors are still undecided on the issue. Third-party interests and stakeholders should be involved in the discussions with SLC and USBR as jurisdiction determinations are made by the SLC. Landowners along the San Joaquin River may be impacted by such decisions by SLC, reducing farmland that is currently in production once restoration flows are re-introduced and projects are developed under the Program.

Chapter 28. Table 2-7. ESA Work-windows/ Construction Timing – Table 2-7 lists the conservation measures for biological resources on a programmatic level. The proposed mitigation measures are so general and all-inclusive that construction timing, actual construction, and permitting would be very difficult due to overlapping ESA timing and mitigation constraints as described in this table. Several proposed mitigation measure in Table 2-7 require lengthy surveys that will delay project implementation. Table 2-7 should be revised to include

EC1-309

1. Potential mitigation banks or mitigation options;
2. The party responsible for obtaining project specific "take" permits for species;
3. The party responsible for paying mitigation and obtaining mitigation credits; and
4. Options for project proponents if no mitigation credits are available.

EC1-310 Page 28-35, line 21-32 indicates that "comments received assisted Reclamation and DWR in identifying the final range of actions, alternatives, site design options, environmental resources, and mitigation measures that are analyzed in the Draft PEIS/R"; however, most of the concerns are supposed to be addressed at the project level.

EC1-311 Interim flow studies – The document describes several interim flow evaluations/ studies that are on-going as interim flows are implemented, however, it does not state when or if the result of these studies will be made available. Interim flow studies that identify additional impacts to adjacent landowners and stakeholders or third-party interests should be re-analyzed and re-circulated for public comment.

EC1-312 Chapter 28. Table 1-3. Program vs. Project-level Permitting – Table 1-3 describes permitting compliance at the "Program" level for many resources; however, most of the permitting will occur at the "Project" level. This table should be revised/corrected to accurately reflect what is contained in the Draft PEIS/R.

EC1-313 Pages 28-10 to 28-11. The draft states that Reclamation and DWR consulted with USACE and it was determined that a Section 404 permit will not be needed for actions described at the project-level in the Draft PEIS/R. Is this correct? Yet, subsequent site-specific projects will have to apply for a permit and the USACE will evaluate to determine whether proposed action is the Least Environmentally Damaging Practicable Alternative (LEDPA). Further, many projects are discussed at the program level and they will require a Sec. 404 permit, e.g. Phase 1 and Phase 2 projects. However, there is no analysis of the LEDPA as required by the EPA. The alternatives analysis in the draft PEIS/R are inadequate to determine the LEDPA and leaves the requirements of Section 404(b)(1) up to each individual restoration project for evaluation during the permitting process. The draft PEIS/R alternatives figure in Section 2-1 does not include LEDPA in the alternatives analysis. The alternatives developed for the draft PEIS/R are based primarily on the a fixed flow determined in the settlement and a list of projects to be implemented and do not adequately analyze the LEDPA under 404(b)(1).

EC1-314 Pages 28-28 to 28-29, lines 33-35. Williamson Act. The Draft PEIS/R says that DWR is exempt from the normal cancellation process because lands would be acquired via eminent domain; page 28-29,

lines 6-7, of the draft PEIS/R says that Reclamation is not exempt and lands would have to go through the normal cancellation process.

EC1-314 cont'd

The draft PEIS/R should state that Notification is required to be submitted to both DOC and the local governing body responsible for administration of agricultural preserves early in the process, as soon as possible after it appears that land within an agricultural preserve will be required for a public use.

Nevertheless, the Act requires that land be acquired from willing sellers. If the SJRRP seeks to take land through a "hostile" condemnation process, it will cause a tremendous backlash within the San Joaquin Valley.

Loss of Important Farmland – Compliance with FPPA

EC1-315

According to Section 1541(b) of the Farmland Protection Policy Act (FPPA) (7 U.S.C. 4202(b)), Federal agencies are (a) to use established criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland. Established criteria for the evaluation are found in the FPPA implementing regulations (7 CFR Part 658.5), and include both land evaluation (LE) criteria and site assessment (SA) criteria (a federal LESA). The Natural Resources Conservation Service (NRCS) coordinates with the federal lead agency on conducting the project specific LESA, which utilizes federal Form AD1006. The FPPA applies to projects and programs sponsored or financed in whole or in part by the federal government.

The draft PEIS/R did not identify statutory requirements for complying with the FPPA. Therefore, the discussion regarding compliance is inadequate.

Mitigation Specified in PEIS/R for Impacts on Agricultural Resources

MM LUP-1b is primarily compliance with the Williamson Act. Compliance with regulatory requirements is not mitigation. The draft concludes that specified mitigation would lessen the impacts on agricultural resources but not to a less-than significant level. It further states that no additional mitigation is available to fully compensate for loss of land under the WA and/or loss of Important Farmland.

EC1-316

Additional mitigation is available to further reduce impacts on agricultural lands, and DOC has provided guidance on what they consider to be appropriate mitigation for loss of Important Farmland and conflicts with WA contracts. They state:

> "Although the direct conversion of agricultural land and other agricultural impacts are often deemed to be unavoidable by an agency's CEQA analysis, mitigation measures must nevertheless be considered. The adoption of a Statement of Overriding Consideration does not absolve the agency of the requirement to implement feasible mitigation that lessens a project's impacts. A principal purpose of an EIR is to present a discussion of mitigation measures in order to fully inform decision-makers and the public about ways to lessen a project's impacts. In some cases, the argument is made that

EC1-316 cont'd

mitigation cannot reduce impacts to below the level of significance because agricultural land will still be converted by the project, and, therefore, mitigation is not required. However, reduction to a level below significance is not a criterion for mitigation. Rather, the criterion is feasible mitigation that lessens a project's impacts. Pursuant to CEQA Guideline 15370, mitigation includes measures that "avoid, minimize, rectify, reduce or eliminate, or compensate" for the impact. For example, mitigation includes "Minimizing impacts by limiting the degree or magnitude of the action and its implementation (§15370(b))" or "Compensating for the impact by replacing or providing substitute resources or environments (§15370(e))."

DOC recommends the following types of mitigation:

- Establishment agricultural conservation easements on land of at least equal quality and size as partial compensation for the direct loss of agricultural land. If a Williamson Act contract is terminated, or if growth inducing or cumulative agricultural impacts are involved, we recommend that this ratio be increased.

- Protecting farmland in the project area or elsewhere in the County through the use of less than permanent long-term restrictions on use such as Farmland Security Zone contracts or Williamson Act contracts.

- Directing a mitigation fee to invest in supporting the commercial viability of the remaining agricultural land in the project area, County or region through an agricultural mitigation bank.

Mitigation of project-level impacts should consider these potential mitigation opportunities.

COMMENTS ON APPENDICES

EC1-317 Appendix D – Physical Monitoring Plan – The draft PEIS/R alleges selenium in the soil profiles in River stretches 2B and 3. The Seepage Management Plan proposes potential mitigation of seepage using projects such as interceptors. The result is a need for a Program water quality monitoring element in the Monitoring Plan.

EC1-318 Appendix G – Plan Formulation – Chapter 1, pg. 7. The NEPA requirements are detailed and include the specific requirement that the documents have information that "allow reviewers to evaluate the comparative merits of the proposed action and alternatives". The draft PEIS/R fails in this requirement as it relies exclusively on the Settlement and the Act for the environmental impact conditions assessed. There is no presentation or comparative effort that allows the reader to determine that this Program and its related Projects and actions are the activities that have the least impact on the environment and yet meets the need to establish an improved salmonid fisheries in the San Joaquin River. The draft PEIS/R needs to, among other alternatives, compare the environmental and social cost of restoring or augmenting salmonids in other San Joaquin River tributaries or River systems so as to allow the reader to understand the difference in impacts among such alternatives. The Settlement and Act make provision for the concept that the Program and Projects may not meet the intended goals of self-sustaining salmonid populations, but without a discussion of alternative opportunities to reach the goals, the value of the efforts cannot be weighed properly against the impacts of the proposed actions. Similarly, as mentioned in prior comments, comparison needs to be made

EC1-318 cont'd to alternatives to the Phase 1 and Phase 2 improvement projects and the hydrographs in Exhibit B of the Settlement.

EC1-319 Appendix G – Chapter 3, pg. 3, line 26. To the discussion of irrigation flow impacts, add: "along the San Joaquin River and Mendota Pool". Furthermore, facilities in the Mendota Pool could provide an opportunity to re-circulate Friant water, especially if the facilities are expanded. Specifically, Lateral 7 of the Westlands Water District could be used for re-circulation as it currently is connected to the California Aqueduct below San Luis Reservoir and the Dos Amigos Pumping Plant thereby eliminating two additional lifts as indicated by diagrams showing pumping points in the lower San Joaquin River system.

Appendix H – Modeling.

EC1-320 Page 2-5. Lines 13-19. The CalSim model uses a monthly time step that may not be appropriate for analysis of Restoration Flow recapture or flood events that occur on a daily or weekly time step. The use of monthly values may significantly underestimate the potential impacts of the Alternatives to water supply, restoration flow recapture, and flood control operations.

EC1-321 Page 3-7. Lines 16-20. Many of the differences are likely caused by the use of a monthly time step that cannot replicate daily or flood event base operations. As noted in the previous comment, the use of monthly values may significantly mask or underestimate the potential impacts of the Alternatives to water supply, restoration flow recapture, and flood control operations.

EC1-322 Page 3-20. Line 21. Releases from Millerton Reservoir to the San Joaquin River can affect the allocation of water to the West Side CVP Contractors. The assumptions section does not describe how the Alternatives account for the changes in the timing and volume of water flowing into Mendota Pool caused by the reoperation, and the resulting impacts on West Side Contractor allocations. Initial model simulations indicate this impact could be around 30 TAF to 1) the restoration allocation, 2) Friant Unit allocation, or 3) West Side CVP allocation. This is a significant water supply issue that must be addressed in the draft PEIS/R since flow-related impacts are being evaluated at a project level of NEPA/CEQA compliance.

EC1-323 Page 3-25. Lines 15-18. The draft PEIS/R states that "These daily values are not intended to represent proposed or optimal daily water operations. Instead, USJRBSI analyses represent a potential set of daily operational values that can be used for further analysis in support of comparisons between alternatives." If the USJRBSI daily values do not represent proposed water operations then they serve no value and cannot be used for analysis of alternative vs. baseline conditions. This is a significant issue that should be addressed in the draft since flow related impacts are being evaluated at a project level of NEPA/CEQA compliance.

EC1-324 Page 3-30. Lines 4-7. Because flow is being evaluated at a project level of NEPA/CEQA compliance, the use of a method that sets the minimum and peak daily values at the mean monthly value will significantly reduce the extreme values and may not provide a reasonable level of detail for analysis of daily flow related impacts. The analysis must account for the range of hydrologic conditions that will be experienced under future alternative conditions.

EC1-325 Page 7-1. Lines 20-21. MEI 2008a page 4 section 2.3 Main Channel Manning's n-values refers to a non standard method used to compute composite roughness values. Has there been any peer review or acceptance by the USACE Hydrologic Engineering Center of this method?

EC1-326 Page 7-2. Lines 7-8. MEI 2008b page 8 section 2.3 Modeling of Roughness Zones refers to a non standard method used to compute composite roughness values. Has there been any peer review or acceptance by the USACE Hydrologic Engineering Center of this method?

EC1-327 Page 7-2. Lines 24-29. The proper definition and application of the seven distinct roughness zone types is critical to model calibration and the evaluation of alternatives. Definition of the zone types should be consistent with related model applications and be validated by actual physical river conditions. A roughness greater than 0.1 may need to account for dense vegetation that significantly impedes flow.

EC1-328 Page 7-2. Line 30. The modeling assumptions section should acknowledge and describe that a non-standard method is used to compute composite roughness values. This assumed methodology could have significant influence on the capacity analysis and impact analyses of the Alternatives. Has there been any peer review or acceptance by the USACE Hydrologic Engineering Center of this method?

EC1-329 Page 7-3. Lines 10-13. What does "the model was validated to the extent possible" mean? Model calibration and validation documents should be referenced here similar to what was provided for the CalSim model. Was the model independently calibrated and validated based on different low and high flow events? What is the level of confidence associated with the model for use to evaluate channel capacity, fish passage, and sediment transport?

EC1-330 Page 7-3. Lines 22-29. Text should state that the model only provides a theoretical evaluation of non-damaging flow capacity and does not account for all the other physical parameters that are affected by the changes in flow frequency, duration, and magnitude. These impacts include increased levee saturation, seepage, piping, and underflow.

EC1-331 Page 7-3. Lines 22-29. MEI 2008c page 1 section 2.1 Water-Surface Profiles states that "it is recognized that discharges of this magnitude may not actually occur in the downstream portions of the reach under existing conditions due to seepage, irrigation diversions, and operating procedure at the large diversion structures along the reach; thus, the discharges and estimated water-surface elevations used in the this flooding and inundation analysis are believed to represent the upper limit of those that are likely to occur in each of the subreaches" This qualifying text should be included in section 7.1.3 with the flow capacity analysis.

EC1-332 Page 7-4. Table 7-1. The notes at the bottom of the table should include a note acknowledging that the non-damaging capacity of Reach 2B is limited to 1300 cfs based on actual flow conditions. Table 7-1 needs to include error bounds on simulated values since additional model calibration is recommended to improve the model.

EC1-333 Page 7-4. Lines 5-6. Are the results of the sensitivity analysis available for review? Were the limitations of the model acknowledged in the results?

EC1-334 Page 7-5. Lines 5-8. Interim and Restoration Flows will need to be reduced if Kings River flows are entering Mendota Pool under flood conditions. Kings River flows may completely occupy the flood flow capacity in Reach 3 below Mendota Pool.

EC1-335 Page 7-5. Lines 8-10. What changes in the operational criteria at the bifurcation structures are being proposed? These should be documented as part of the flood flow operations analysis. The operational rules should acknowledge that the Mendota Pool Bypass will not be used for flood flow purposes under any conditions.

EC1-336 Page 7-5. Lines 17-18. Tetra Tech 2009 page 2 Section 3 Evaluation of Likely Failure Points (LFP) refers to use of the Comp Study UNET model to evaluate which locations would require strengthening under project conditions. The analysis is limited to the comparison of water surface profiles for advertised (design) capacities based on the steady-state HEC-RAS model and does not account for other physical parameters that influence levee stability due to changes in flow frequency, duration, and magnitude. Potential impacts include increased levee saturation, seepage, piping, and underflow. The comparison of the LFP to the computed advertised water surface profile is not an adequate evaluation.

EC1-337 Page 7-5. Lines 17-18. Tetra Tech 2009 page 3 Section 3 Evaluation of Likely Failure Points (LFP) notes that the results of the UNET analysis highlight the need for a detailed study of both the geotechnical stability and top-of- levee profiles in Reach 3 and 4A before a determination can be made regarding the need to strengthen them as part of the Restoration project. This need for a detailed study should be acknowledged in the PEIS/R section on flood control.

EC1-338 Page 7-5. Lines 119. The Model description section needs to state if the non-standard method used to compute composite roughness values in HEC-RAS was also applied to the Comp Study UNET model. This assumed methodology could have significant influence on the capacity analysis and impact analyses of the alternatives.

EC1-339 Page 7-6. Lines 13-22. Due to the sandy composition and condition of many of the levees, likely failure is not simply a function of a defined water surface but of the duration and frequency of flow in the channel. An analysis based on likely failure points for given water surface elevations does not adequately capture the increased flood risk in the Restoration area as a result of Interim and Restoration flows.

EC1-340 Page 7-8. Lines 21-23. It should be clearly stated in the draft PEIS/R Alternatives description and assumptions that the proposed Mendota Pool Bypass will not be operated for flood flow conveyance.

Appendix L. Biological Resources - Vegetation and Wildlife

Attachment: Invasive Vegetation Monitoring and Management Plan.

EC1-341a Page 1-1. Lines 29-31 and Attachment 2-1 Line 17. The Invasive Vegetation Monitoring and Management Plan acknowledges the importance of controlling invasive riparian species by stating that "Unless the spread of invasive riparian species is controlled, achievement of the restoration objectives of the Settlement could be seriously compromised by invasive species." The plan describes monitoring efforts that would be implemented to document the spread of invasive species and guide control efforts; however, it is

EC1-341a cont'd

unclear how the program can effectively identify and control invasive plant species if it is restricted to publicly accessible lands. Given the reasonable likelihood that invasive riparian plants will colonize restoration areas, the draft PEIS/R should include an analysis of the feasibility of implementing an invasive plant monitoring and control program without access to all lands adjoining the river and bypasses. In addition, the draft PEIS/R should describe the potential impacts of invasive riparian plants on vegetation and wildlife and the prospect of restoration project success within the context of substantial long-term control measures and diminished habitat functions resulting from invasive plant species.

EC1-341b

The Invasive Vegetation Monitoring and Management Plan focuses on four invasive riparian plants that have the potential to influence the success of the restoration project. The plan does not address other aquatic invasive plants, such as South American spongeplant (Limnobium laevigatum). This invasive species, which was recently established (2008) in the San Joaquin River system, is the subject of ongoing eradication efforts by the California Department of Food and Agriculture. According to the California Department of Food and Agriculture, the establishment of spongeplant has the potential to adversely affect fish and wildlife, recreation, native vegetation, flood control, canal maintenance, and vector control (Akers 2010). Accordingly, the draft PEIS/R should specifically analyze the following.

- The potential effects of Restoration Flows and continuous wetting of the river channel on the reproduction and spread of spongeplants;
- The potential effects of Restoration Flows on the ability to provide adequate eradication or control measures for spongeplant;
- The potential effects of establishment of spongeplant on native vegetation communities and associated fish and wildlife in the San Joaquin River
- The potential effects of establishment of spongeplant on third-party flood control and irrigation facility operation and maintenance.

We also recommend the inclusion of South American spongeplant in the Invasive Vegetation Monitoring and Management Plan and encourage Reclamation to work with the California Department of Food and Agriculture and affected third-parties to develop an effective eradication program.

EC1-341c

CCID currently manages invasive species within its system using both mechanical and chemical methods. Non-native plants that are particularly challenging include water hyacinth and, more recently, South American spongeplant. California Department of Food and Agriculture (CDFA) resource specialists suspect that Interim Flows and Restoration Flows may spread exotic aquatic and riparian plants more extensively, and at a greater rate, than patterns observed over the last several decades. These restoration-related range expansions of invasive plants could create additional maintenance demands on CCID and other water districts, and could reduce the functional efficiencies of the water system.

EC1-341d

Costs incurred by CCID and others to manage invasive aquatic species that can be reasonably attributable to restoration actions must be borne by Reclamation as mitigation costs.

EC1-342

Appendix N, Geomorphology, Sediment Transport, and Vegetation Assessment

EC1-342 cont'd

Page 5-16. Lines 25-26. The section of text on Reach 2A describes the results of the SRH-1D sediment transport and vegetation response modeling. The text states "the base flow under Project Conditions in this reach will substantially increase the amount of vegetation in the reach". Lines 33-35 state that "native plant productivity doubles from Baseline Conditions when Alternative A flow is introduced". Invasive plants also increase by 18%. Lines 37-38 state "In the downstream subreach of Reach 2A, Alternative A flows increased base level of low flows and subsequently increased vegetation coverage along the banks."

These model predictions support the need for a comprehensive sediment/vegetation management plan and development of a long-term O&M agreement between Reclamation and the LSJLD to provide financial support for on-going sediment and vegetation management in the Restoration Area.

EC1-343

Page 5-21. Lines 7-10. The section of text on Reach 2B describes the results of the SRH-1D sediment transport and vegetation response modeling. The text states "Sand transport was estimated to increase from 4,300 tons/year to more than 33,000 tons/year. This is a seven fold increase in the amount of sand transported in this reach". Lines 21-24 state "Levee and flood control measures are recommended in this reach to account for future deposition." Yet, there is no discussion of mitigation or how the additional sand will affect operations.

EC1-344

Page 5-21. Lines 25-29. The section of text on Reach 2B describes the results of the SRH-1D sediment transport and vegetation response modeling. The test states "The increase in base flows in this reach under Project Conditions is anticipated to increase the amount of vegetation in the channel.... Increases in base flow will support a riparian vegetation community". Page 5-22 lines 12-13 states "Average plant productivity width in this reach is estimated to increase by a factor of 1.5 to 2, relative to Baseline Conditions." Yet, there is no discussion of mitigation or how the additional vegetation will affect operations.

EC1-345

Page 5-32. Lines 24-26. This text on Reach 4A notes that Baseline simulations in 4a predicted almost continuous flow, but acknowledged that the reach is generally dry a majority of the time. This causes an error in the impact analysis since the conclusion on lines 33-34 is that there is very little difference in predicted vegetation between Alternative A and baseline conditions. In fact, there will likely be significant vegetation growth as a result of Interim and Restoration Flows in Reach 4A. This impact should be documented in the draft PEIS/R.

EC1-346

Page 5-35. Lines 9-12. The section of text on Reach 4B1 recommends the following "Future levee design to protect adjacent properties should be incorporated in future modeling run to accurately predict sediment transport and geomorphic channel change in this reach. Results presented herein are preliminary and do not represent the influence of possible levees". Since Reach 4B1 may be expanded to convey up to 4500 cfs, it is critical that a thorough sediment transport and geomorphic analysis be conducted to evaluate potential channel migration, vegetation, and O&M issues.

EC1-347

Page 5-35. Lines 24-26. The summary findings for Reach 4B1 predict an average erosion of 1.9 feet under the 4500 cfs scenario over a 17–year simulation period. This erosion must be considered in the design process to account for additional seepage potential and impacts to levee stability.

EC1-348 Page 5-38. Lines 33-34. The section of text on Reach 4B2 describes the results of the SRH-1D sediment transport and vegetation response modeling. The text states that "The Alternative A flows had approximately 15 to 20 percent more native plant productivity in this reach".

All of these model predictions above support the need for a comprehensive sediment/vegetation management plan and development of a long-term O&M agreement between Reclamation and the LSJLD to provide financial support for on-going sediment and vegetation management in the Restoration Area.

EC1-349 Page 5-43. Lines 4-5. The section of text on Reach 5 describes the results of the SRH-1D sediment transport and vegetation response modeling. The text states "The simulated plant productivity under Alternative A flows was approximately 30 percent greater in Reach 5a and 38 percent greater in Reach 5b. Alternative". This significant increase again demonstrates the need for a comprehensive sediment/vegetation management plan to prevent increases in flood risk.

EC1-350 Page 5-47. Lines 34-35. The section of text on the Eastside Bypass states that "Under project conditions, flows are restored to Reach 4B1 and less flow is diverted to the Eastside Bypass. This may be true under the condition of 4B1 at 4500 cfs, but with 4B1 at 475 cfs Restoration pulse flows will need to flow through the Bypass on a more frequent basis and will result in an increase in vegetation growth. This increase in vegetation growth needs to be documented in the PEIS/R.

EC1-351 Section 5. General. The geomorphic, sediment transport, and vegetation analysis needs to evaluate potential impacts to the Chowchilla Bypass. Changes in sediment transport and river form in Reach 2A may cause changes to sediment transport and deposition in the Chowchilla Bypass.

III. Recommendations and Assessments for a Practical Approach and Alternatives to Implementation of the SJRRP

Introduction

The SJRRP is faced with significant challenges. Reclamation must restructure the development of the SJRRP to reflect the funding realities. Congress will not be providing the large sums of money according to the timetable that was anticipated when the Act was passed. At best, Reclamation can expect more modest appropriations spread over many years.

EC1-352a

When negotiations were conducted over the legislation that resulted in the Act, the Exchange Contractors made it clear that development of "half a project" was untenable. We believe the Settling Parties and the sponsors of the legislation were in accord. In order to avoid a situation where an unsuccessful project is developed, the Exchange Contractors requested their consultants, CH2MHILL, review the Phase 1 and Phase 2 improvement projects and prioritize them in terms of projects that should be developed. Further, they were requested to reassess the costs of the SJRRP and to develop a schedule of development based upon an assumed funding stream. The following pages include set forth the results of these assessments.

SJRRP Phase 1 and Mitigation Projects Prioritization and Implementation Based on Conditions Known as of 9/20/2011

The Exchange Contractors requested CH2MHill to review the Phase 1 and Phase 2 projects together with the goals of the SJRRP. The following is a product of the work.

The RMC is unique in that it represents the interest of landowners, agencies and other stakeholders throughout the entire project area, all of which have the potential to bear substantial economic and environmental costs that could result from direct and indirect impacts from the implementation of the Restoration Program. Without appropriate mitigation, RMC members will be substantially impacted as result of direct and indirect impacts if restoration actions are not thoroughly evaluated and carefully implemented. Likewise, as the water supply agencies, the Exchange Contractors bear a risk that if the SJRRP is not successful, they could be looked to for assistance. Further, their water operations could be adversely impacted as a result of project effects and/or the presence of protected species. A SJRRP that is not fully functional, implemented and operational, but rather is implemented in a partially completed state, is not in the best interests of the Exchange Contractors.

EC1-352b

Reclamation should prioritize mitigation and Phase 1 project actions to initiate engineering analysis and design as soon as possible. Engineering analysis and design should consist of two major components: (1) determine the existing levee and channel constraints by Reach, and (2) conduct an analysis of possible alternatives for levee and channel improvements. The alternatives analysis should incorporate historical knowledge and local understanding and be coordinated closely with local agencies and landowner representatives. Additionally, agreement on the appropriate assumptions for the analyses with local agencies and landowners should be obtained early in the process. These analyses should be based on the best available information, include field studies and data collection as needed, and be conducted to professional standards using established engineering practices. All engineering design should be conducted to Reclamation, DWR, and/or USACE design standards and guidelines, as appropriate.

EC1-352c

Prioritization of Mitigation and Phase 1 Projects

The comprehensive planning and design process must consider all the restoration actions as part of a complete implementation effort and ensure that the construction phasing of actions in one reach of the river does not create unintended impacts in other reaches. Design and construction activities should begin with needed mitigation projects and then proceed to higher priority Phase 1 projects that do not impose potential impacts on third parties and local land owners.

Table 1 provides a priority ranking of needed mitigation and Phase 1 projects. Mitigation projects that allow for safe conveyance of restoration flows should be completed before initiating construction on Phase 1 projects. Required mitigation projects in Reach 4A, Reach 3, and Reach 2A are ranked with a priority level of 1 through 3 and constitute a substantial portion of the infrastructure improvements necessary to safely convey Interim and Restoration Flows, including necessary integration with flood flows, including those from the Kings River. Mitigation improvements include levee stabilization, installation of slurry walls and interceptor drains, vegetation management, and increased funding for operations and maintenance.

Phase 1 projects that do not require additional mitigation and do not cause redirected impacts, "no-regrets" projects, should be the next priority. Another benefit of these "no regrets" projects is that they will not become stranded assets if future funding is delayed. As shown in Table 1 priority levels 4 through 9, these Phase 1 "no-regrets" projects include:

EC1-352d

- Arroyo Canal Fish Screen and Sack Dam Fish Passage
- Hills Ferry Fish Barrier improvements
- Mud and Salt Slough adult fish barriers
- Modify or demolish the Sand Slough Control Structure
- Modify Reach 4B headgate
- Modify Eastside and Mariposa Bypass structures

Phase 1 Projects that require mitigation as part of project design and construction or to prevent re-directed impacts, should be implemented subsequent to the "no-regrets" projects, only if full funding is available to complete the project. Table 1 shows these projects as priority levels 10 through 13. These projects include:

- Eastside and Mariposa low-flow channel
- Mendota Pool Bypass
- Reach 2B enlargement to 4500 cfs
- Reach 4B1 enlargement to 475 cfs

Once the Phase 1 projects are implemented, then Phase 2 projects should be considered. The exception is if the Reach 1 gravel pits are determined to be a significant predation issue, then options to fill or isolate the pits should be elevated to a higher priority.

Implementation of Mitigation and Phase 1 Projects

Comprehensive funding for construction and future operation for any Reach must be in place prior to initiating any project construction activities within that Reach. All restoration improvements, operations and maintenance (O&M) agreements, and mitigation measures must be constructed and fully functional before salmonids are re-introduced to the upper San Joaquin River to ensure successful implementation of the Settlement and to prevent unintended impacts to third parties.

A comprehensive planning process must be undertaken to prevent and mitigate direct and indirect impacts of the Restoration Program to third parties. To ensure that actions in one Reach of the river do not create unintended impacts in other areas, this comprehensive planning process should consider all the restoration actions as part of a complete implementation effort and avoid taking half measures. Likewise, comprehensive funding for the restoration program is required to ensure that all required restoration and mitigation actions are funded and implemented.

The SJRRP will increase the frequency and magnitude of flows in the San Joaquin River below Friant Dam. This increase in flows will exacerbate existing levee stability and seepage problems and may exceed channel flow capacities in some reaches. Levee and channel improvements are needed in Reaches 2A, 2B, 3, 4A, 4B1, and 4B2 to safely convey the Restoration Flows. Improvements to reduce or eliminate
EC1-352e impacts to levee stability and adjacent lands from increased seepage must be coordinated throughout all Reaches, with other improvements such as riparian habitat restoration, water supply, and flood control operations. Detailed engineering analysis and design must be conducted for all proposed levee and channel improvements.

Reaches 2B and 3 of the San Joaquin River provide critical water supply conveyance for the delivery of water under existing water rights. Implementation of the SJRRP has the potential to impact these water supply operations through insufficient channel capacities and operations of new structures, including the proposed Mendota Pool Bypass. Restoration actions must be carefully planned and designed to maintain flexibility in water supply operations throughout the river system.

Flood control operations on the San Joaquin River include conveyance of flood flows from the San Joaquin River and the Kings River and operation of the Lower San Joaquin River Flood Control Project. Restoration actions, including levee and channel improvements, the Mendota Pool Bypass, and revised operating criteria for the Chowchilla Bifurcation Structure have the potential to conflict with the routing of flood flows. Proposed restoration actions should not reduce the channel design capacity or the system's overall ability to convey flood flows. Existing channel design capacities and flood operations must be the first priority and maintained to protect public safety.

Fish passage and screening facilities are needed in all Reaches. This includes facilities to allow fish passage around or over existing or proposed structures, screens on diversions to prevent entrainment, reconstruction of road crossings, and permanent barriers on sloughs. These facilities should be designed in accordance with NMFS Fish Screening Criteria for Anadromous Salmonids, criteria established by the CDFG, other applicable criteria at the time of construction, and in accordance with established professional engineering practices. Fish passage and screening facilities will require additional O&M to maintain,

increasing O&M costs for the owner or operator. O&M agreements and funding to cover increased O&M costs would be needed.

EC1-352e cont'd

Creation of riparian habitat restoration is needed in all Reaches of the San Joaquin River. However, this action may be in direct conflict with the LSJLD's channel and flood control obligations. An overall "landscape" design should be used in the engineering and hydraulic analysis conducted for levee and channel improvements, and agreement with local agencies and landowners on critical assumptions for the analyses should be sought early in the process. This landscape design should include sufficient detail to be used as a guide for long-term management of riparian vegetation by a local maintaining agency, and be the basis for the redesign of flood control channel cross sections to account for the establishment of future mature vegetation in the channel.

EC1-352f

Table 1
San Joaquin River Restoration
Draft Phase 1 and Mitigation Projects Prioritization

Priority Ranking	Project Authority	Reach	Project Description	Observed Issues prior to Restoration Program	Initial Impacts from Restoration Actions	Necessary before fish reintroduction	Mitigation
1	PL111-11 Sec 1004(d)	4A	Levee and drainage improvements	Limited short-term seepage during flood events mainly from the Kings River	Significantly increased frequency and magnitude of flows increase seepage, resulting in crop damage and exacerbating existing levee stability problems	Yes	Stabilize levees; install slurry walls and interceptor drains; vegetation management; increased O&M funding
2	PL111-11 Sec 1004(d)	3	Levee, urban utility, and drainage improvements	Limited short-term seepage during flood events mainly from the Kings River	Significantly increased frequency and magnitude of flows will increase seepage, resulting in crop damage and exacerbating existing levee stability problems; potential urban flooding and utility problems	Yes	Stabilize levees; install slurry walls and interceptor drains; vegetation management; increased O&M funding urban utility improvements to sewer and water systems
3	PL111-11 Sec 1004(d)	2A	Levee and drainage improvements	Piping and seepage observed at flows greater than 4,000 cfs well below the design capacity; historical levee failures	Increased frequency and magnitude of flows increase seepage, resulting in crop damage and exacerbating existing levee problems	Yes	Stabilize levees; install slurry walls and interceptor drains; increased O&M funding
4	Settlement Paragraph 11(a) Phase 1 Improvement	3	Arroyo Canal Fish Screen and Sack Dam Fish Passage	None	Fish entrainment	Yes	No
5	PL111-11 Sec 1004(h)(4)	5	Improve and maintain Hills Ferry fish barrier	Existing barrier has limited ability to prevent salmon up migration	False pathway for up migration of Salmon	Needed during interim flows	Improve barrier; increased O&M funding

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Priority Ranking	Project Authority	Reach	Project Description	Observed Issues prior to Restoration Program	Initial Impacts from Restoration Actions	Necessary before fish reintroduction	Mitigation
6	Settlement Paragraph 11(a) Phase 1 Improvement	5	Mud and Salt Slough adult barriers	None	Fish entrainment	Yes	No
7	Settlement Paragraph 11(a) Phase 1 Improvement and 11(b)(1)(4)	Sand Slough	Modify or demolish Sand Slough Control Structure	Serves no purpose	Significantly increased frequency and magnitude of flows increase seepage, resulting in crop damage and exacerbating existing levee stability problems	Yes	No
8	Settlement Paragraph 11(a) Phase 1 Improvement	4B	Modify Reach 4B headgate for fish passage and water conveyance	None	None	Yes – assuming fish to be routed in 4B1	No
9	Settlement Paragraph 11(a) Phase 1 Improvement	Flood Bypass	Modify Eastside and Mariposa Bypass structures for fish passage	None	None	Yes	No
10	Settlement Paragraph 11(a) Phase 1 Improvement	Flood Bypass	Eastside and Mariposa Bypasses low-flow channel	Existing flood bypass channels not intended for fish passage or restoration flows	Increased frequency of flows increase seepage, resulting in crop damage and exacerbating existing levee stability problems; increased vegetation growth	Yes – assuming fish routed in Eastside Bypass	Install slurry walls and interceptor drains; vegetation management; increased O&M funding

EC1-352f cont'd

Priority Ranking	Project Authority	Reach	Project Description	Observed Issues prior to Restoration Program	Initial Impacts from Restoration Actions	Necessary before fish reintroduction	Mitigation
11	Settlement Paragraph 11(a) Phase 1 Improvement	2B	Mendota Pool Bypass (to 4,500 cfs)	None	Bypass flows will impact water quality and water supply operations; seepage	Yes	Install slurry walls and interceptor drains; relocate Columbia Canal Company intake, infrastructure replacement; increased O&M funding
12	Settlement Paragraph 11(a) Phase 1 Improvement	2B	Reach 2B enlargement (for 4,500 cfs)	Seepage and levee stability problems at flows greater than 1300 cfs	Increased frequency of flows may increase seepage, resulting in crop damage and exacerbating existing levee stability problems; increased vegetation growth	Yes	Install slurry walls and interceptor drains; infrastructure replacement; vegetation management; increased O&M funding
13	Settlement Paragraph 11(a) Phase 1 Improvement	4B1	Reach 4B1 enlargement to 475 cfs	Lack of levees throughout much of the reach; lack of defined river channel	Inadequate capacity for restoration flows; lack of comprehensive levee system, low flow channel, and floodplain; potential seepage induced high groundwater and resulting crop damage	Yes - assuming fish to be routed in 4B1	Construct levees with slurry walls and interceptor drains; infrastructure replacement; vegetation management; increased O&M funding
Phase 2	Settlement Paragraph 11(b) (1)	4B1	Reach 4B1 channel enlargement to 4,500 cfs	Lack of levees throughout much of the reach; lack of defined river channel	Inadequate capacity for restoration flows; lack of comprehensive levee system, low flow channel, and floodplain; potential seepage induced high groundwater and resulting crop damage	No – depends on fish routing	Construct levees with slurry walls and interceptor drains; infrastructure replacement; vegetation management; increased O&M funding
Phase 2	Settlement Paragraph 11(b)(1)(2)	2A	Modify Chowchilla Bifurcation Structure	Structure not designed to prevent fish passage	Potential to impede flood flows depending on improvements	Yes - Depends on fish losses	Increased O&M funding

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Priority Ranking	Project Authority	Reach	Project Description	Observed Issues prior to Restoration Program	Initial Impacts from Restoration Actions	Necessary before fish reintroduction	Mitigation
Phase 2	Settlement Paragraph 11(b)(1)(3)	1	Fill or isolate gravel pits in Reach 1	Existing gravel pits provide habitat for predators	High potential for significant predation losses	Yes – Extent depends on predation levels	No

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Wildlife Resources and Construction Schedule

In the Executive Summary Draft PEIS/R there is a Table ES-6 "Conservation Measures for Biological Resources that may be affected by Settlement Actions". This information is presented in Table 4-5 and related text in Section 4.2.4 Conservation Strategy, of Appendix G, Plan Formulation.

The concern is that the draft PEIS/R does not address any potential solutions or effects of the various sensitive times for the various biological resources and a potential construction schedule, if projects are actually going to get built.

As an example, CH2MHill looked at just the fish and wildlife biological resources listed in the two tables and compared the restricted work period as presented with the assumed open work period. We did not look at the plant species. This is presented graphically in the following Table.

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SJRRP - Biological Resources and Construction Work Periods

Species	J	F	M	A	M	J	J	A	S	O	N	D
Ca. Tiger Salamander												
Giant Garter Snake												
Bald Eagle & Golden Eagle												
Swainson Hawk												
Other nesting raptors												
Other birds protected by the Migratory Bird Treaty Act												
Burrowing Owl												
San Joaquin Antelope Squirrel												
Fresno Kangaroo Rat												
San Joaquin Kit Fox												
Pacific Lamprey												
Delta Smelt												
Central Valley Steelhead												
Sacramento Valley winter-run Chinook salmon												
Central Valley spring-run Chinook salmon												
Essential fish habitat (Pacific salmonids & starry flounder)												

Source: Table 4-5 of Appendix G "Plan Formulation"

Restricted work period

Open work period

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As shown in above Table, it is highly probable that there is no available time for construction during a calendar year. Obviously, if the SJRRP is to be successful, a number of large projects will have to be constructed. In order to be efficient with the state and federal dollars allocated to the SJRRP, work will have to be conducted throughout the year. Therefore the various state and federal fish and wildlife agencies will need to cooperate so that construction can occur in an expedited and efficient manner throughout a given calendar year.

Potential Implementation Schedule for Phase 1 Projects

We have listed the nine major Phase 1 projects as identified in the draft PEIS/R and have also included one mitigation project (Levee and Drainage Improvements) in a proposed implementation schedule shown below.

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The implementation schedule is based on our SJRRP experience, our experience on other large complex programs, and our experience in the implementation of large infrastructure on the Sacramento River from the 1990's through today to protect endangered and threatened fish species. The implementation schedule assumes that funding is not a limiting factor, and that the work started on four projects in the spring of 2011 will continue (Arroyo Canal Fish Screen/Sack Dam Fish Passage, Mendota Pool Bypass to 4,500 cfs, Reach 2B enlargement to 4,500 cfs, and Reach 4B1 enlargement to 475 cfs). For the six projects that have not started yet, we assumed that two would start in January 2012 and the remaining four would be spread out every 6 months thereafter.

For each project we have listed seven major tasks/phases from a feasibility study to construction. The following provides the assumptions for each of the major tasks:

1) Feasibility Study. Duration is dependent on the complexity of the project, from 6 months to 2 years.
2) NEPA/CEQA environmental documents. If the project is relatively non-controversial then we have assumed it will be an Environmental Assessment (Federal)/Initial Study (State) resulting in a Finding of No Significant Impact (Federal)/Negative Declaration (State). If the project is relatively complex and controversial then we have assumed it will be an Environmental Impact Statement (Federal)/Environmental Impact Report (State) resulting in a record of decision. Duration is dependent on the complexity of the project, from 12 months to 2 years.
3) Final Design. Final design would not start until the NEPA/CEQA process is complete. Duration is dependent on the complexity of the project, from 12 months to 2 years.
4) Land acquisition/easements. Each project will require some type of land acquisition or construction easement, or right-of-way easement. This process can usually not occur until final design has started but can be a time consuming process. Duration is dependent

on the number of land owners and the complexity of the project, from 12 months to 3 years.

5) Construction Permits. Obtaining construction permits from local, state, and federal agencies is usually done during the final design stage. Ideally the permits should all be obtained prior to bidding, but often the last of the permits do not come in until the start of construction. Duration is dependent on the complexity of the project, from 12 months to 18 months.

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6) Bidding and Construction Award. The time to bid the project, evaluate the bids, and obtain the necessary bonds and insurance from the apparent low bidder, and award a contract takes a minimum of five months assuming its going through Reclamation procurement. The Arroyo Canal/Sack Dam project is going through HMRD and is assumed to be at the most four months.

7) Construction. Duration is dependent on the complexity of the project and the potential to be impacted by flood waters. We have assumed 12 months to five years.

This implementation schedule has the Program starting in February 2011 and ending in August 2020, over about a 10-year period.

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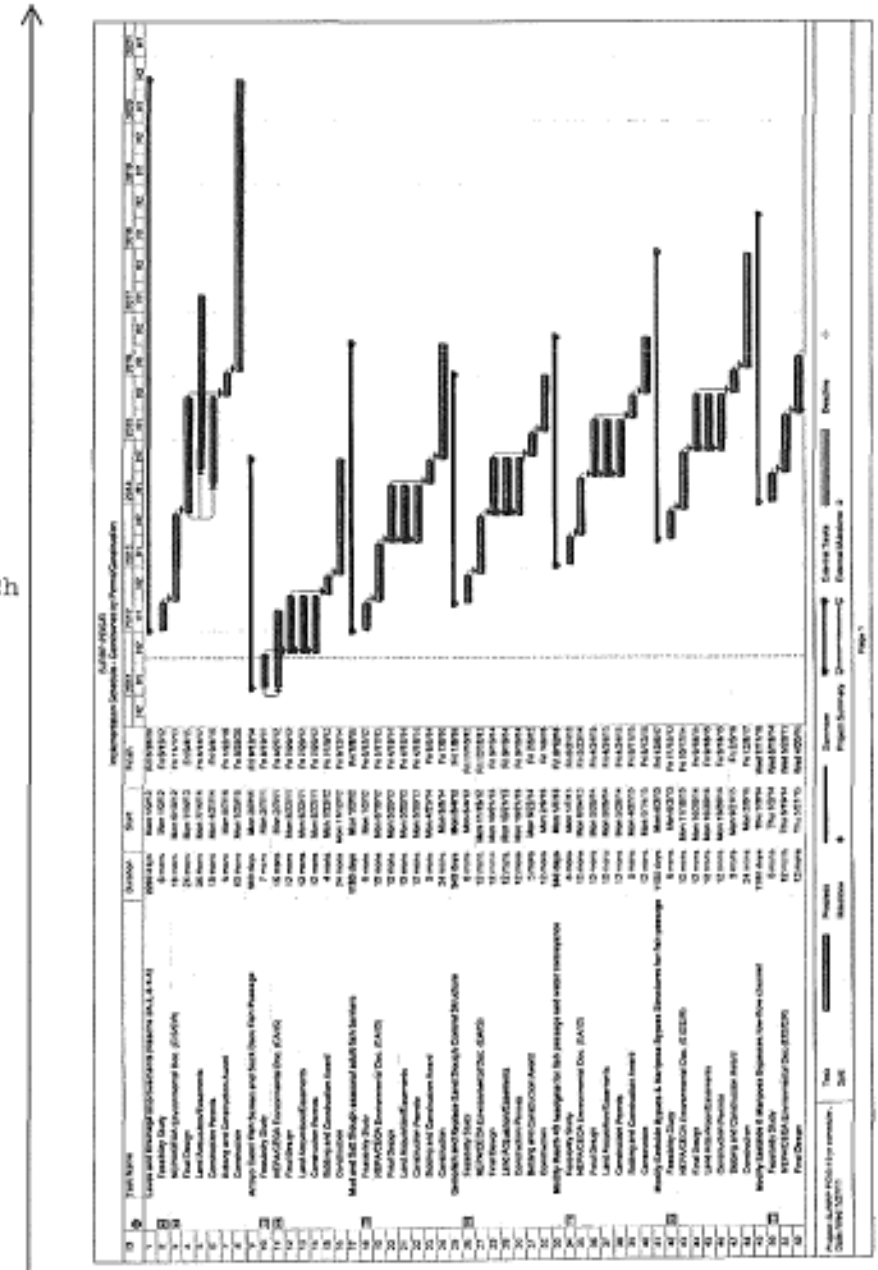

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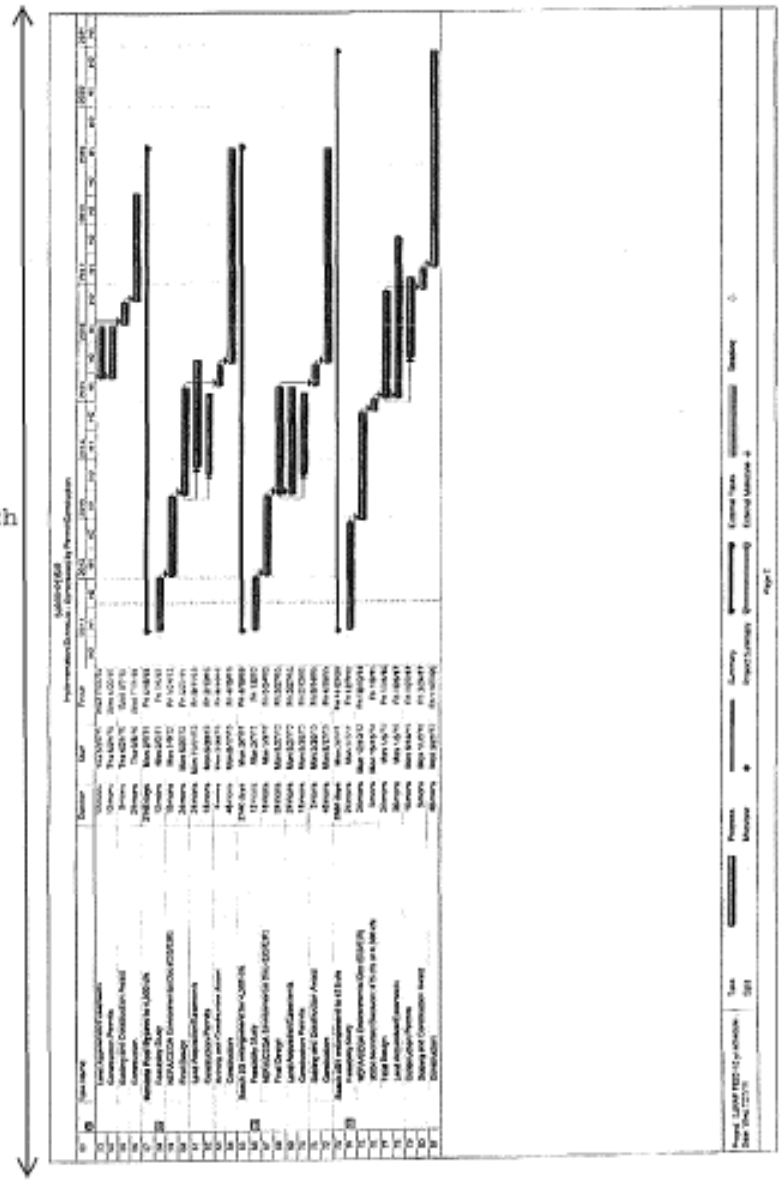

Potential Implementation Schedule for Phase 1 Projects – Funding Restricted

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Another implementation schedule that we have developed assumes that available funding is limited to either $25 million per year or $50 million per year. The implementation schedules for the individual projects as presented in the schedule above would stay the same, except that their initial start dates would be greatly staggered and the time for construction would be expanded.

As presented in the cost assumptions update by CH2M HILL, the overall cost of the Program is about $1.5 billion assuming the mid-point of construction is 2017. At $25 million of available funding per year, the program would take over 60 years to implement. At $50 million of available funding per year, the program would take over 30 years to implement.

Assumptions for San Joaquin River Restoration Cost Estimate (August 5, 2011)

Channel and Levee Improvements

Channel and levee improvement costs were developed based on a restoration flow of 4,500 cubic feet per second (cfs) through Reaches 1 through 5. The Expert Witness Report of Peter J. Hradilek, Ph.D. served as the basis for this cost estimate, along with recent work on the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project and Mendota Dam. The assumptions for the channel and levee improvements and fish passage and screen cost estimates are described in detail below.

1. Reach 1

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The channel and levee improvement cost estimate for Reach 1 was taken directly from Hradilek's Expert Report. No adjustment was made to quantities or unit costs.

- Reach 1 extends from River Mile (RM) 267.5 to RM 229 (38.5 miles).

2. Reach 2B and Mendota Pool Bypass

Costs for Reach 2B and the Mendota Pool Bypass were obtained from estimates presented in the *Mendota Pool Bypass and Reach 2B Improvements Project, First Administrative Draft, Project Description Technical Memorandum*, by USBR in May 2011 (hereafter referred to as First Administrative Draft).

The First Administrative Draft acknowledges the need for seepage mitigation measures for all new levees and potentially impacted lands. The costs for the Mendota Pool Bypass and Reach 2B alternatives presented in the First Administrative Draft range from $452 million to $577 million, which is based on 2007 labor, equipment, and material rates. The distribution of cost for levee and channel improvements and fish passage and screens was not provided. The

costs presented in the First Administrative Draft include the resources to procure and manage contractors, construct the project, and purchase land. Costs include contingencies based on the guidelines presented in the USBR March 1989 "Cost Estimating Handbook".

It is assumed that all necessary costs have been included in the capital cost estimate and for the purposes of this evaluation $500 million (2007 dollars) will be assumed for Reach 2B and the Mendota Pool Bypass.

3. Reaches 2A through 4B (excluding 2B)

The assumptions for material quantities and unit costs for Reaches 2A through 4B (excluding 2B) are described in detail below. In general, these quantities and unit costs are consistent with those used in Hradilek's Expert Report, with the exception of the following: (1) slurry wall quantities and unit costs; (2) inclusion of interceptor drains (3) land acquisition costs; (4) channel and levee improvements in Reach 4A; and (5) sand removal from the Eastside Bypass.

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- Reach 2A extends from RM 229 to RM 216 (13 miles).
- Reach 3 extends from RM 204.8 to RM 182 (22.8 miles).
- Reach 4A extends from RM 182 to RM 168.5 (13.5 miles).
- Reach 4B extends from RM 168.5 to RM 135.8 (32.7 miles).

a. Levee Construction or Improvements

Costs for levee construction or improvements will depend on a variety of site-specific factors including levee design, local geology and other local conditions, and the source of construction materials. For the purposes of the cost estimate, a unit cost of $9.00/cubic yard was used for all levee construction or improvement actions. This unit cost assumes that local materials would be used for construction/improvement actions. With regard to design characteristics, this unit cost assumes a levee crown width of 20 feet, 3 feet of freeboard at design flow, and that the levees would be constructed in accordance with standards set forth by the U.S. Army Corps of Engineers and the California Department of Water Resources. This unit cost is the same as was used in Hradilek's Expert Report.

b. Slurry Wall Installation

The depth of a slurry wall will depend on a variety of site-specific factors, and Hradilek's Expert Report assumed a 60-foot slurry wall depth. Sixty-foot slurry walls may or may not be appropriate as seepage barriers. Many site-specific studies will be required to determine the appropriate slurry wall depth. However, a depth of 60 feet is extremely conservative given the

shallow depth of the water in the channel and the short height of the levees. Based on our experience, it was assumed that a 50-foot slurry wall would be sufficient and unit costs were revised accordingly. In addition, Hradilek assumed a unit cost of $14.00/square foot for slurry wall construction. This unit cost is very high based on cost information provided by the U.S. Army Corps of Engineers. A value of $8.00/square foot was used based on the long open sections of the project and the reduced depth of the slurry wall. Preliminary estimates provided by the San Joaquin River Exchange Contractors Water Authority (SJRECWA) indicate the following length of slurry walls will be required for each reach:

- Reach 3: 7.0 miles (includes both levees)
- Reach 4A: 5.0 miles (includes both levees)
- Reach 4B1: 8.4 miles (includes both levees)
- Reach 4B2: 3.6 miles (includes both levees)

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c. Interceptor Drain Installation

The depth of interceptor drains was assumed to be 6 feet below the adjacent ground surface on the land side of the levee. Site specific studies will be required to determine the appropriate interceptor drain depth. A value of $250/linear foot was used based on the long open sections of the project. Preliminary estimates provided by the SJRECWA indicate the following length of interceptor drains will be required for each reach:

- Reach 2A: 26 miles (includes both levees)
- Reach 3: 38.6 miles (includes both levees)
- Reach 4A: 22 miles (includes both levees)
- Reach 4B1: 35.6 miles (includes both levees)

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d. Rock Slope Protection, Clearing and Grubbing, Channel Excavation

Rock slope protection, clearing and grubbing, and channel excavation costs are summarized below and were taken directly from Hradilek's Expert Report. The quantities and unit costs in Hradilek's Expert Report were reviewed and determined reasonable, and no adjustments were made to these quantities or unit costs.

Action	Unit Cost	Reach
Rock Slope Protection	$61.35/ton	Reach 2B
Clearing and Grubbing	$2,500/acre	Reaches 4A and 4B, Eastside Bypass
Channel Excavation	$6.00/cubic yard	Reach 4B and Eastside Bypass

e. Land Acquisition

Although not included in Hradilek's Expert Report, the attached cost estimate includes land acquisition costs. Approximately 5,130 acres would be acquired based on estimates provided in the Expert Witness Report of Dr. Michael D. Harvey. Per acre land costs were assumed to be $15,000 based on information provided by the SJRECWA.

f. Channel and Levee Improvements in Reach 4A

Channel and levee improvements were added for Reach 4A. Unit costs were the same as were used for the other reaches, and it was assumed that both left and right levees would need to be improved for the entire reach (13.5 miles) with a height based on the average of the nearby areas.

g. Eastside Bypass

Channel improvements include removal of sand from the Eastside Bypass. It was assumed 650,000 cubic yards of material would be removed from the bypass beginning at the Sand Slough Control Structure and extending approximately 2 miles downstream, based on information provided by the SJRECWA. For the purposes of the cost estimate, a unit cost of $13.00/cubic yard was used for sand removal. This value assumes a haul distance of 10 miles or 20 mile roundtrip.

At this time there is insufficient information upon which to address costs for the Eastside and Mariposa Bypasses.

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Fish Passage and Screens

The Expert Witness Report of Edward E. Donahue served as the basis for the fish passage and screens cost estimate. Donahue's Expert Report presented conceptual-level designs for the various fish passage and screens based on juvenile fish passage design guidelines prepared by the National Marine Fisheries Service and the California Department of Fish and Game.

Costs were taken from Donahue's Expert Report for all reaches except Reach 5. The Reach 5 costs are comprised of two main components: (1) screening riparian diversions; and, (2) screening Mud and Salt sloughs. Costs for screening riparian diversions were derived from Donahue's Expert Report. Costs for screening Mud and Salt sloughs were assumed to be similar to screening a large diversion pump ($525,000 for each slough). Costs for hydraulic structures, fish screen structures, and fishways were revised based on construction cost estimates prepared for multiple fish passage improvement projects on the Sacramento River.

Cost Estimate

1. Contingencies and Mark-ups

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Contingency costs reflect the level of detail and completeness of the cost estimate, as well as the degree of uncertainty of factors and assumptions used in the cost estimate. Mark-up costs include mobilization/demobilization, insurance and bonds, planning and engineering, construction management, and environmental documentation and permitting. Mark-up costs are costs that will be incurred by the project and that generally increase with increasing project size and complexity. The following contingencies and mark-ups were used:

Contingency/Mark-up	Amount
Mobilization/Demobilization	5% of Construction Costs
Insurance and Bonds	3% of Construction Costs
Construction Contingencies	25% of the Construction Subtotal
Planning and Engineering	12% of the Total Probable Construction Costs
Construction Management	10% of the Total Probable Construction Costs
Environmental Documentation and Permitting	7% of the Total Probable Construction Costs

Note: Construction Subtotal = Construction costs + mobilization/demobilization + insurance and bonds
Total Probably Construction Costs = Construction Subtotal + construction contingencies

Because of the relatively high uncertainty for the restoration actions, including the limited amount of design information and limited information on local conditions (such as geotechnical data), the cost estimate should be viewed as a relative order-of-magnitude estimate. Detailed estimates cannot be prepared at this time as there is not sufficient information. The

construction contingency and mark-ups are intended to capture costs that cannot be included in a more detailed estimate at this time.

2. Cost Escalation

The original cost estimate was prepared in 2005. The Engineering News-Record Construction Cost Index at the 20-city average was used to adjust cost to the 2011 market value. All costs were escalated at 3 percent per year to the mid-point in construction, which is now anticipated to be 2017.

3. Probable Program Cost

The estimated cost for the San Joaquin River Restoration Program assumes a restoration flow of 4,500 cfs and a midpoint of construction in 2017. The following costs were estimated by reach:

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cont'd

Reach	Channel and Levee Improvements	Fish Passage and Screens[a]	Total
1	$17,609,000	$11,461,000	$29,069,000
2A	$139,438,000	$942,000	$140,380,000
2B	See Total[b]	See Total[b]	$681,087,000[c]
3	$229,248,000	$26,263,000	$255,512,000
4A	$137,998,000	$11,746,000	$149,744,000
4B	$367,770,000	$37,640,000	$427,065,000
Eastside Bypass[d]	$17,698,000	$0	$17,698,000
5	$0	$1,884,000[e]	$1,884,000
Total	-	-	**$1,680,785,000**

General Note: Costs have been adjusted from 2005 to 2011 using the 20 City Average from ENR CCI and escalated from 2011 to 2017 (assumed midpoint of construction) using an escalation rate of 3% per year.
[a]Fish passage and screen costs from Donahue Expert Report and experience with similar projects on the Sacramento River.
[b]The *Mendota Pool Bypass and Reach 2B Improvements Project, First Administrative Draft, Project Description Technical Memorandum* did not include a distribution of cost for levee and channel improvements and fish passage and screens.
[c]Costs for Reach 2B and the Mendota Pool Bypass were obtained from estimates presented in the *Mendota Pool Bypass and Reach 2B Improvements Project, First Administrative Draft, Project Description Technical Memorandum*. The cost has been adjusted from 2007 to 2011 using the 20 City Average from ENR CCI and escalated from 2011 to 2017 (assumed midpoint of construction) using an escalation rate of 3% per year.
[d]Includes cost to remove approximately 650,000 cy of sand from the Eastside Bypass and drainage improvements.
[e]Includes cost for seasonal barriers on Mud and Salt sloughs.

Thank you for the opportunity to comment on the Draft PEIS/R. If you have any questions concerning these comments, please contact the undersigned.

Sincerely yours,

Thomas M. Berliner

TMB:fs

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Documents Referenced in Comments and Provided Electronically on Accompanying DVD

Appraisal Report – San Joaquin River Settlement Agreement and Legislation

San Joaquin River Settlement Agreement and Legislation, September 20, 2007

Appendices to San Joaquin River Settlement Agreement and Legislation, September 20, 2007

EC and RMC Objection – Protest Concerning USBR WY2010 Petitions for Temporary Transfers of Water

Exchange Contractors Protest to USBR Temporary Petitions for Temporary Transfer Permits, August 31, 2009

Addendum to Exchange Contractors Protest to USBR Temporary Petitions for Temporary Transfer Permits regarding Mendota Pool, September 21, 2009

EC1-352j Resource Management Coalition Protest to USBR Temporary Petitions for Temporary Transfer Permits, August 31, 2009

EC-RMC Objection – Protest Concerning USBR WY2011 Petitions for Temporary Transfer of Water

Exchange Contractors and Resource Management Coalition protest to K. Mrowka, SWRCB Division of Water Rights, August 16, 2010, with attachments 1-10.

EC-RMC Objection – Protest Concerning USBR WY2012 Petitions for Temporary Transfer of Water

Exchange Contractors and Resource Management Coalition protest to K. Mrowka, SWRCB Division of Water Rights, September 9, 2011, with attachments 1-13.

Expert Testimony – NRDC v. Rodgers

Friant Experts

Expert Witness Report of Edward E. Donahue, "Fish Passage within the San Joaquin River", August 2005

Expert Report of Charles H. Hanson, "Lower San Joaquin River Salmonid Restoration" August 22, 2005, and including supplemental declaration of Charles H. Hanson, July 23, 2004

Expert Report of Michael D. Harvey regarding Geomorphic Requirements for Restoration of an Anadromous Fishery in the Upper San Joaquin River, August 18, 2005

Expert Witness Report of Peter J. Hradelik, "Lower San Joaquin River Restoration Infrastructure Improvements Strategy Report", August 22, 2005

Expert Report of Daniel B. Steiner, "Effects to Water Supply and Friant Operations due to Changes in Releases to the San Joaquin River", August 19, 2005

NRDC Experts

Plaintiffs' Expert Designations, August 15, 2005

Expert Report of Michael L. Deas, August 2005

Expert Report of Kenneth W. Kirby, August 2005

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Expert Report of G. Matthias Kondolf, August 2005

Expert Report of Peter B. Moyle, August 2005 including supplemental insert of August 22, 2005

USBR Experts

Expert Report of Merlynn Bender, "Millerton Lake CE-QUAL-W2 Temperature Modeling", August 2005

Expert Report of Joseph P. Kubitschek, "San Joaquin River Physical Condition and Engineering Considerations for Rehabilitation", August 2005

Expert Report of Donald J. Smith, August 2005

Expert Report of Tracy B. Vermeyen, "Millerton Lake and San Joaquin River Temperature Monitoring and Flood Release Data Collection Activities", August 2005

Expert Report of Rodney J. Wittler, "Restoring or Enhancing Fisheries By Rehabilitating A Regulated River", August 2005

Hatchery and Genetics Management Plan – December 2010

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SJRRP Hatchery and Genetics Management Plan, December 2010

Interim Flows – Environmental Review

Comments of the Exchange Contractors regarding WY2012 Interim Flows, July 21, 2011

Draft FONSI, Supplemental EA 2012 Interim Flows Project

Draft Supplemental EA, 2012 Interim Flows Project

Draft Supplemental EA - Appendix A_G. 2012 Interim Flows Project

Draft Supplemental EA - Appendix H_I. 2012 Interim Flows Project

FONSI, Supplemental EA 2011 Interim Flows Project

Final Supplemental EA, Part 1, 2011 Interim Flows Project

Final Supplemental EA, Part 2, 2011 Interim Flows Project

Final Supplemental EA, Part 3, 2011 Interim Flows Project

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Final Supplemental EA; Attachment A-1, Part 1; 2011 Interim Flows Project

Final Supplemental EA; Attachment A-1, Part 2; 2011 Interim Flows Project

Final Supplemental EA; Attachment A-2; 2011 Interim Flows Project

Final Supplemental EA; Appendix A, Part 1; 2011 Interim Flows Project

Final Supplemental EA; Appendix A, Part 2A; 2011 Interim Flows Project

Final Supplemental EA; Appendix A, Part 2B; 2011 Interim Flows Project

Final Supplemental EA; Appendix B; 2011 Interim Flows Project

Draft Supplemental FONSI 2011 Interim Flows Project

Draft Supplemental EA 2011 Interim Flows Project

Draft Supplemental EA - Appendix A. Part 1; 2011 Interim Flows Project

Draft Supplemental EA - Appendix A. Part 2; 2011 Interim Flows Project

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Draft Supplemental EA - Appendix B; 2011 Interim Flows Project
Draft Supplemental EA - Appendix C; 2011 Interim Flows Project
Draft Supplemental EA - Appendix D; 2011 Interim Flows Project
Draft Supplemental EA - Appendix E; 2011 Interim Flows Project
Draft Supplemental EA - Appendix F. Part 1; 2011 Interim Flows Project
Draft Supplemental EA - Appendix F. Part 2; 2011 Interim Flows Project
Draft Supplemental EA - Appendix G; 2011 Interim Flows Project
Signed FONSI, 2010 Interim Flows Project
Final EA/IS - Chapters 1-3; 2010 Interim Flows Project
Final EA/IS - Chapters 4-8; 2010 Interim Flows Project
Final EA/IS - Appendix A,Settlement, Part 1; 2010 Interim Flows Project
Final EA/IS - Appendix A,Settlement, Part 2; 2010 Interim Flows Project
Final EA/IS - Appendices B-C; 2010 Interim Flows Project
Final EA/IS - Appendix D; 2010 Interim Flows Project
Final EA/IS - Appendix E; 2010 Interim Flows Project
Final EA/IS - Appendix F; 2010 Interim Flows Project
Final EA/IS - Appendix G, Chap. 1-7, Att.1; 2010 Interim Flows Project
Final EA/IS - Appendix G, Att.2; 2010 Interim Flows Project
Final EA/IS - Appendix G, Att.3; 2010 Interim Flows Project
Final EA/IS - Appendix G, Att.4-5; 2010 Interim Flows Project
Final EA/IS - Appendix G, Att.6, Part 1; 2010 Interim Flows Project
Final EA/IS - Appendix G, Att.6, Part 2; 2010 Interim Flows Project

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Final EA/IS - Appendix H; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 1-2; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 3, Part 1; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 3, Part 2; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 3, Part 3; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 4, Part 1; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 4, Part 2; 2010 Interim Flows Project

Final EA/IS - Appendix I, Chap. 4, Part 3; 2010 Interim Flows Project

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San Joaquin River 2011 Draft Annual Technical Report

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Notice of Filing of Memorandum of Understanding Between Settling Parties and State of California, *NRDC v. Rodgers,* September 13, 2006

Statement by the San Luis & Delta Mendota Water Authority in Support of Settlement and Entry of Judgment, *NRDC v. Rodgers,* October 6, 2006

Memorandum of Understanding Among Third Parties regarding Implementation of Settlement, *NRDC v. Rodgers,* February 26, 2007

Statement of Jason Peltier before the House Subcommittee on Water and Power, March 1, 2007

San Joaquin River Litigation Settlement, Questions and Answers

Statement of Sen. Dianne Feinstein in Support of San Joaquin River Settlement, May 3, 2007

Statement of Mark Limbaugh before the Senate Subcommittee on Water and Power, March 3, 2007

CRS Report for Congress regarding San Joaquin River Settlement, November 9, 2007

Senator Dianne Feinstein Press Release regarding Settlement, May 7, 2008

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🗀Excerpt of Record concerning "Seepage"

San Joaquin River Exchange Contractors Water Authority, "Impacts of the San Joaquin River Restoration Flows", November 12, 2010

🗀**Seepage Management Plan**

Seepage Management Plan (Draft), San Joaquin River Restoration Program, March 28, 2011, with Appendices A-K

🗀**Seepage Project Handbook**

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SJRRP Reach 2B and Mendota Pool Bypass Value Planning

US Department of Interior, Bureau of Reclamation, Value Planning Report (Draft), San Joaquin River Restoration Project Reach 2B and Mendota Pool Bypass, May 20, 2011

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Letter from Commissioner Michael Connor to Hon. Dennis Cardoza, U.S. House of Representatives, dated November 10, 2010, regarding interim flows