Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
700	1	For over 50 years we have watched ongoing diversions of water decimate the Delta and decimate our fisheries to the point where several species now face extinction. However, during the last 5 years of this severe drought we have watched water continually being diverted from the Delta to South Valley corporate farms. And during that time these farms have not only done well, they have continued to grow -- the number of acres that have been planted -- and they have enjoyed record financial gains. However, at the same time with these ongoing water diversions the Delta is near the point of collapse. Some of the issues caused by these ongoing diversions are potential extinctions for our fisheries, continuing intrusion of salt destroying the Delta farms, potential loss of the Delta's ecosystem, potential loss of safe drinking water standards for the 4 million people who live in and adjacent to the Delta, and the toxicity of the Delta's waterways caused by this Board's granting waivers to farmers to use herbicides and pesticides, so that these farmers no longer have to comply to California's Clean Water Act.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
700	2	Six years ago this Board reported that to protect the Delta a rate flow of 60 percent of unimpeded fresh water was needed to maintain the Delta from the months of February to June. And just three years ago, the California Department of Fish and Wildlife reached the same conclusions. We would hope that in making your decisions that this Board comply with the doctrine of public trust and state law and recognize that the potential catastrophic issues facing the Delta. We ask this Board to support the ongoing freshwater flows released from the San Joaquin, Stanislaus and Tuolumne rivers. And in upgrading the Bay-Delta Quality Water Plan make your decisions based on the best science available.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
701	1	We have saltwater coming in to our rivers, because we don't have enough water going out. We also have saltwater coming in to our aquifers, where the aquifers pour into the ocean. There's not enough water to push back there either. The Army Corps of Engineers -- a very bright group, I've worked with them as an architect years ago -- we have 18 rivers that have blocks to fish being able to get up to the spawning grounds. You would think that after all these years we could improve these dams, weirs and blockages. The Baroda Weir, it's right here, it feeds our town. I've been asking for over 20 years get rid of the flume. Put in a proper fish ladder that fish can use. We're watching the spawning grounds being silted over and poisoned over. It's just unbelievable. Recently, there was a claim that we had no drought and that we were up here protecting a worthless three-inch fish and our water would be gotten to the southern counties. It seems as though God made a mistake in making that fish.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
702	1	I really oppose the flows. The Delta is in peril. I cut about half of my stuff out, because most of the people have said what I feel. But we've got Egeria, we've got Water Hyacinth, we've got toxic algae that I fear is only going to get worse if we have less flows going through the Delta. There's been several dogs that have died, because they go out and swim in it, they come out, they clean themselves. Well, what happens when we start watering our crops with this? If we reduce the flows we're going to have more problems. And the salinity is going to be an issue. I look out my backyard and I can see seals and sea lions all the way up; I live next to I-5. I found a large body of a salmon that a seal had gotten a couple of weeks ago. You can't	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		blame them, they're coming this way because the Bay is also in such an unhealthy array that they have to come this way for food. You go by the port you can hear all of them underneath the docks. We can't afford for any more flows to be taken away from the Delta.	
702	2	As somebody stated, all of the businesses that have left, we had at one time over 100 boats in our club, so a couple hundred people; we're down to 60. A lot of it revolves around some of our favorite destinations to go out and boat and recreate. We can't go there anymore, because a lot of it being the Egeria, the Water Hyacinth. I just -- I hope you can see my side and some of the people who have brought the fact that this is one of the most beautiful estuaries and the economic value that it holds. Please don't destroy it.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
703	1	I'm Dante John Nomellini, I'm the Manager and Co-Counsel for the Central Delta Water Agency. My perspective is a little different here in that I focus in on the water rights that we have in the system. And in my view this is an attempt to put burdens from the State Project and the Federal Project on to the local watersheds and senior water right holders, which I view is an improper action and a violation of the law. We hear a lot about doing things, suffering, spreading the pain in this and that. But basically, we have senior water rights in these tributaries that need to be respected. And the water projects themselves have junior water rights. And the shortage that we're all fighting over is due to the fact that the projects were supposed to be limited to surplus water and they've failed to do the development that was planned.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
703	2	I see what you're doing. You're going to degrade water quality, which I think is a terrible thing for you to do--the salinity or for agriculture you're going backwards on that. You've got strong policies. This state is expected to lead the United States and the world and you guys are going to go backwards. And I see that as simply some pressure from the exporters coming on you, because we all know that in order to get the leaching fractions you have to have the proper soil conditions. So it's obvious to me what it is. Now, when we go to the watersheds and we start taking this water out, if it's not surplus water it's going to add to the burden of trying to bring our groundwater in the balance. And a lot of these things that are talked about is conservation: short the water flow into the underground, short the replenishment. So what we need to do is look at whether or not this is sustainable. In my opinion, if you're not dealing with surplus flows to meet the fisheries it's short-lived, so any investment that we make--and you know, I know what the background deal is--you go ahead and pay these irrigation districts money like they did with that San Joaquin River Agreement before they get the money. It actually shorts the water flow during the rest of the year, because the fish flows are February through June. We have to sustain the rivers for the balance of the year. So what they do is they don't release the water for power production later, or whatever it is. What we need to do--and of course you're aware of the federal legislation where they're talking about a one-for-one diversion at the export pumps to the flow in the San Joaquin River that is supplemented by these efforts that we're talking about. So we have to look at projects that actually develop yield in the basin, in the watersheds. Part of that yield can be used for fish, part can be used for further development. To me, that's where we have to go. Otherwise we're just going to fall farther and farther behind.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
704	1	I'm a civil engineer residing here in Stockton and practicing as a Water Resources Consultant. I advise clients that use water from the San Joaquin River, the Lower San	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		Joaquin River here in Stockton and its tributaries: the Mokelumne, the Calaveras, Stanislaus, Tuolumne and Merced rivers further up the Valley. Over 17 years ago, one of your predecessors on the Board here, a soft-spoken, brilliant civil engineer by the name of John Brown provided me counsel on the role of the State Board and its lack of a comprehensive statewide plan. It has taken me a long time to understand what Mr. Brown was trying to teach me, but I think I now get it. And you still don't have a plan. The proposed actions defended by the SED are simply a stopgap by your Board to address the latest crisis that you face. Per your documents, you intend to 1) take surface water that you think you need for ESA reasons, but actually it appears that it's to be an attempt to fulfill your commitments to both the state and Central Valley projects. And 2) you adapt your commitments, these commitments, over time probably taking more water. And then finally you amend the water rights according to these first two steps. The impacts of these actions should be considered unacceptable to you as they do to most of the people in this room. I believe the term ass-backwards describes your proposed actions. I implore you as a State Board to please hit this pause button and consider reversing the order of your proposed actions. As Mr. Brown suggested so politely, you need to first assemble a statewide comprehensive water plan. Then amend your water rights that you have issued, to date. And then finally divvy up any remaining water in accordance with such a comprehensive plan.	
705	1	TID's diversions from the Tuolumne River for farming have been the same since 1926. Fluctuating, of course, along with the water type year. Turlock Irrigation District has served the same 150,000 irrigated acres for close to a century. Our farming footprint hasn't increased over the last 100 years. Rather our district is a model for what sustainable farming looks like in California. Some groups speaking in front of you have implied or outright stated that excess diversions for farming have damaged the fishery in our region over the past 90 years. However, TID's diversion paradigm has not changed in the last 90 years. During this time ensuring flows have actually increased. The average parcel size within TID is less than 30 acres. It's been conveniently, for some advocates of increased flows, to label TID growers as corporate farmers. However, that is not what TID is and is not who our over 5,800 growers are. I would also like to respond to your staff presentation a little bit. According to our own analysis in 2014 and 2015, we would have had a zero allocation for any of our growers under the new SED paradigm if it was in place in the past.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
705	2	This SED as written does not give us the room to work with the various agencies to do the things that the river needs and deserves. Our agencies can either plan for a decade-long legal battle or we can actually do something meaningful for the river without harming our region. I'm asking you to thoroughly review the best and incorporate TID's pending technical comments and recent science conducted on the Tuolumne. After you have reviewed all our comments, please communicate with us and our experts to revise the SED over the coming months. Allow us the opportunity to work together to arrive at a collaborative solution that minimizes the impacts to the region and can maximize the benefits to the fishery. There's a better way and the Turlock Irrigation District is here to help you guys find it.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
706	1	I have some comments on the document. The only numerically quantified assessment on the fishery in the SED is the fall-run Chinook salmon. I know the staff has said the SalSim model is flawed and were, quote, "Surprised to see that it didn't produce a lot of fish." End quote. SalSim shows an average increase over baseline production of 1,103 fall-run Chinook salmon at 40 percent unimpaired flows. Based on the admission of staff that the SalSim model and results are flawed I have one simple question. Why are we still moving forward with this process? If the main model to show the benefit to the fishery is not accurate, how can staff be recommending any flow conditions at all? You need to put off this process; don't rush this. There is no reason to vote on a document that isn't 100 percent backed by science. The impacts to my operation and the community will be devastating. Go back to the drawing board. Allow the districts and other stakeholders to provide input to fish population models. Allow the science to be defendable. Let's get this right. Let's not settle for a plan that's based on averages and riddled with errors. Let's have factual, quantitative and beneficial results. Your document can't be fixed. Stop this process, get the districts involved, and let's develop a plan that we can all live with.	Please see Master Response 3.1, Fish Protection, regarding best available science and SalSim. Also refer to the section that explains why the State Water Board used SalSim for justification of the use of the model, proper interpretation of its results, and expectations for its applicability to fisheries management decisions. Refer to Chapter 19, Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30, Section 19.4, Introduction of SalSim, specifically the "Executive Summary of SalSim" subsection and the "Model Use Advisory Issued by the Developers" subsection, for discussions of SalSim as the best available science and its broad acceptance by the scientific community. Please refer to Master Response 3.2, Surface Water Analyses and Modeling, for discussion of the use of best available information and incorporation of stakeholder input regarding information used in models and modeling approaches.
707	1	EPA's review of proposed water quality standards is subject to the requirements and the goals in the Clean Water Act. And water quality standards are intended to protect many different beneficial uses, which you see examples of pictured on the screen [ATT:1, ATT:2]. So you have municipal water supply for drinking water and watering lawns, agricultural water supply for crop irrigation, aquatic life beneficial uses for coldwater habitat and migratory habitat and spawning and rearing. And then you have recreational uses for swimming and boating and commercial and recreational fisheries.	Please see Master Response 1.1, General Comments, regarding the consideration of beneficial uses and a general discussion of the State Water Board's authorities.
707	2	We know in the SED process the State Water Board has said that the existing standards aren't protecting aquatic life beneficial uses. But we also thought it was important just to observe that the latest list of the impaired water bodies shows that 85 percent of existing beneficial use impairments are to aquatic life beneficial uses. So we very much support the State Water Board's effort to update water quality standards in this effort for the Phase 1 update. We specifically support the State Water Board's effort to update flow standards to improve aquatic life beneficial uses. So this chart [ATT:1, ATT:3] should look familiar to you. It was presented by your staff on November 29th in their presentation and it shows fall-run salmon adults, relative to flow levels that the juvenile cohort experienced two-and-a-half years prior. And we can see here that higher flow levels for juveniles generally result in higher numbers of adult salmon. I also drew a line across the top, this is something I added to the chart, that shows the salmon doubling target for the salmon protection objective. This is the portion for the Lower San Joaquin River Watershed. And it represents the estimated naturally returning adults for fall-run Chinook salmon for the Tuolumne, Merced and the Stanislaus rivers. And that is an estimate of about 78,000. So this figure really shows that freshwater flows in the Lower San Joaquin River Watershed play a significant role in determining abundance of fall-run Chinook salmon adults, attaining the salmon protection objective and protecting the beneficial use. All of which support the Water Board's actions to adopt flow standards and improve conditions for this commercial fishery and for aquatic life uses overall.	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. The commenter provided an attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	3	I want to focus on the narrative objective [ATT:1, ATT:4]. And the proposed narrative objective is an application from February to June much like the numeric objective. And we	Please see Master Response 3.1, Fish Protection, for discussion of flow conditions in the February through

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		agree with the text of the narrative objective and all summaries here, but it's to provide flow conditions that support and maintain the natural production of viable native San Joaquin River Watershed fish populations migrating through the Delta. So we think the text is good, but we think it should apply year-round. And to support that we used this table for the SED, Table 7-4, and it shows that target fish species are in the system year-round. The dark colored boxes and the light gray boxes together show the primary occurrence and non-primary occurrence periods in the system. We've talked with staff about this for several years. And we understand it will cause a large delay to go back and make the narrative objective year-round. So instead of suggesting that we recommend slightly modifying the text of the narrative objective to state the implementation of the Lower San Joaquin River flow objectives should not cause adverse impacts to fish and wildlife from July to January. So just in the months outside the window of the narrative objective. MS. D'ADAMO: I have a question on that? MS. FORESMAN: Yeah? MS. D'ADAMO: Are you proposing that that be in the table? MS. FORESMAN: Uh-huh, Table 3, yes. We submitted it in our letter and we have the text in there.	June timeframe and discussion of year-round flows.
707	4	I'm going to focus on the numeric flow objective. The SED proposal is for a 30 to 50 percent unimpaired flow range at the confluence of each one of the tributaries: the Stanislaus, Tuolumne and Merced rivers. And the implementation plan suggests starting at 40 percent of unimpaired flow. And this has been discussed as having a block of water to use for aquatic resource management. The proposed block of water approach, we feel has a better chance of success, if we define the equations and the measurements that determine the size of the block of water in Table 3 of the Water Quality Control Plan. And we're making this recommendation, because that provides instream users and consumptive users a way to calculate and estimate how much water they will have to work with during that month or season.	The comment summarizes characteristics of the plan amendments. Please see Master Response 1.1, General Comments, for responses to comments that do not raise significant environmental issues. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding calculation of unimpaired flow and percent of unimpaired flow for compliance and commenter suggested modifications to the plan amendments.
707	5	The next recommendation we have is to identify reservoir storage targets again in the objective {ATT:1, ATT5]. And I put the assumption that was used in modeling in the little blue part of the beaker there, the end of your September storage of 300,000 acre-feet. That's the assumption that was used in the modeling, in the SED and we did see substantial habitat benefits, which we were very encouraged by. But we're concerned that those benefits won't actually occur if we don't have some sort of decision rule that holds some water in the reservoirs to be used when it's needed for temperature mitigation.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding the LSJR flow program of implementation, including discussion of carryover storage and adaptive implementation. Reservoir carryover storage is important to attain the narrative LSJR flow objective. Specific carryover requirements are not established to avoid constraining future implementation. Please see Master Response 1.2, Water Quality Control Planning Process, regarding implementation of the plan amendments through separate water rights proceedings. Please see Master Response 3.2, Surface Water Analyses and Modeling, regarding reservoir operations assumptions, including carryover storage. The model results in the SED present a range of potential and likely generalized operations, sufficient to evaluate water supply and other effects of the project from a programmatic perspective. The State Water Board modeled potential reservoir operations (including carryover storage) to show the range of potential environmental impacts in such a way that the public and the State Water Board can compare the relative effects.
707	6	We're also recommending that the starting percent of unimpaired flow be included in the objective in Table 3, not just in the implementation plan. And we want to couple that with a	The commenter referred to comments made in a letter submitted to the State Water Board as part of the public review process. For the full context of the letter and hat are referenced and a complete response to

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		biologic goal for shifting percent of unimpaired flow within the approved range. So an example of a biological goal is perhaps using a freshwater survival rate for achieving salmon doubling. This would be for fall-run Chinook salmon. So if you have a freshwater survival rate that is achieving doubling within a specified time period you could pick three to four salmon generations or approximately ten years. Then if you're achieving that rate then you can reduce your percent of unimpaired flow within the approved window to below 40. If you're not achieving that rate then you need to increase your flows to above 40. And we feel like this is a good way that you can use a biological goal coupled with the percent of unimpaired flow to ensure that you're actually making progress toward achieving the salmon doubling objective, or I'm sorry, the salmon protection objective.	those remarks, please refer to the index of commenters in Volume 3 to locate the material from the November 2016 public hearing, which will be identified by the person's name and is assigned a letter number. Please also see Master Response 2.2: Adaptive Implementation for further information regarding monitoring of survival that may be used along with other biological metrics for measuring progress toward the objectives as part of adaptive implementation.
707	7	We're recommending that we add a percent of unimpaired flow compliance point at Vernalis. As I explained earlier the proposal is to have compliance points at the confluence of the Stanislaus, Tuolumne and Merced rivers. But once that water enters the lower stem, the stem of the Lower San Joaquin River, then it's really not protected anymore. And if you add a percent of unimpaired flow compliance point at Vernalis it'll increase the likelihood that those waters actually get to Vernalis [ATT:1, ATT:6]. And one reason this is so important is that we need the flow range at Vernalis to promote survival through the Delta. And that is part of the intent for Phase 1 update of the Water Quality Control Plan. And this is a very important piece that I want to make sure I get right, so I'm going to check my notes, but we need to be thinking of the next phase and ensuring that flows at Vernalis are high enough to provide an uninterrupted San Joaquin River corridor through the Delta. So in many ways the success of Phase 2 is really dependent on the flow range that we identify in Phase 1 to make sure that we can successfully move juvenile salmon from Vernalis through the Delta [ATT:1, ATT:8]. MS. D'ADAMO: But then maybe what you're not -- maybe what you're looking for is a block of water, a certain amount of water, as opposed to unimpaired flow. Because unimpaired flow especially -- well it could get pretty low. MS. FORESMAN: Well, so there is the base flow standard at Vernalis which is 1,000 CFS, which I think is substantially lower than the 30 to 40 percent range that's being proposed in most years. And I think that what I mean to say is that we need that range to be high enough to promote that survival through the Delta. Did that answer your question? MS. D'ADAMO: (No audible response.) MS. FORESMAN: Okay.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for a response to comments regarding protection of flows provided by the plan amendments in the tributaries and the LSJR and the Delta. Please also refer to Master Response 2.1, Amendments to the Water Quality Control Plan, for information about science and policy support for adopting the plan amendments.
707	8	Adaptive management will be part of the implementation and we support the State Water Board using active adaptive management [ATT:1, ATT:8] to shape flows and to really get the most we can out of the water in the river for this beneficial use. We feel like it will be more successful if at the outset, the rules of the working group participants are defined. That there is some structure and function for decision-making processes that the work group participants can use. And that they don't need to use their precious time to come up with that at the beginning to provide some criteria to trigger management actions and to do some work ahead of time, so that we can identify targets for shaping flows. And I think doing all of these things will set up the working group for a successful start.	Please see Master Response 2.2, Adaptive Implementation, for responses to comments regarding the structure of adaptive implementation, flow shaping, and consensus. It is correct that many of the details of how adaptive implementation and related activities will occur are not specified. The program of implementation described in Appendix K provides adequate structure for adaptive implementation to occur. Master response 2.2, Adaptive Implementation, provides examples of how adaptive implementation may be used to shape flows, and also what happens when there is no consensus on how to shape flows.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
707	9	We're recommending that the State Board establish an independent monitoring assessment and science program [ATT:1, ATT:9], recognizing that adaptive management is being relied upon, so heavily for implementing the standard. And that you'll need data sources you can trust. And right now I don't think you're collecting all the data that you'll need to make informed decisions. And this is a more efficient way to get the data that you need to the decision makers, than identifying individual monitoring requirements for individual users. Instream flows are needed to protect aquatic life uses all year. We're recommending that you adopt standards that are well defined and protect the beneficial use [ATT:1, ATT:10]. We recommend that you identify a structure and targets for adaptive management and to establish a monitoring assessment and science program to give adaptive management process the information it needs.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, and SED Appendix K for responses to comments and information regarding the San Joaquin River Monitoring and Evaluation Program. Oversight and review of this monitoring is important, so in addition to State Water Board oversight, the following language has been added: "The State Water Board will request the Delta Science Program to conduct periodic reviews of the San Joaquin River Monitoring and Evaluation Program." Master Response 2.2, Adaptive Implementation, provides additional description and examples of how adaptive management may proceed and the bounds under which it may do so.
707	10	I'm from the National Marine Fisheries Service. I'm the Division Manager in the California Central Valley office. I wanted to talk about was the NOAA Fisheries role, or otherwise known as National Marine Fisheries Service [ATT:2]. The West Coast region of the National Marine Fisheries Service manages approximately 90 species of fish, along the coastline that are dependent on the marine environment. Many of those are commercial fishing species and many also depend on the estuarine environment. And so, in our case, the fish that are in the San Joaquin area that are germane to this discussion, is the California Central Valley steelhead, as well as designated critical habitat of the Central Valley spring-run Chinook salmon. We also have the Magnuson-Stevens Fishery Conservation and Management Act, which designates essential fish habitat for Pacific salmon in our area that we're talking about [ATT:2, ATT:1]. And then finally, there's a reintroduced population of Central Valley spring-run, upstream of our area in the San Joaquin River Restoration Program we designated a non-essential experimental population several years ago. And downstream of the restoration area, those fish would be simply Central Valley spring-run.	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.
707	11	Our first comment is related to the 40 percent default and 30 to 50 percent range that you proposed. And as discussed in the documents, in the prior documents as well as the SED, the 60 percent unimpaired value would be the best for increasing survival and perhaps a recovery of our species. However, we recognize this isn't a recovery plan. And there are many, many factors that you are taking into account. We agree that 40 percent is a good start for the start of this. And we want to make it clear though that we don't expect to achieve recovery with that 40 percent [ATT:2, ATT:2]. According to our assessment we think 40 percent would likely have higher flows on the Stanislaus River slightly, and higher flows on the Tuolumne and Merced rivers, that would benefit fisheries. We have commented on this before. We do feel that a year-round flow schedule is important. Both of our species are commonly in fresh water for far longer than the February to June period. And so we feel that the whole year needs to be looked at. We also recommend a flow criteria at Vernalis similar to what EPA was talking about [ATT:2, ATT:3].	Please see Master Response 1.1, General Comments, for responses to comments that do not raise significant environmental issues and for responses to comments that that generally support the plan amendments, a specific percent of unimpaired flow, or an LSJR alternative. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding a description of the plan amendments including the months of the LSJR flow objectives, the justification to reasonably protect the beneficial use of fish and wildlife in response to the implementation of the plan amendments, the relationship of the recovery of native fish populations and the plan amendments, and modifications requested by commenters to the plan amendments. Please see Master Response 3.1, Fish Protection, regarding the scientific justification for the plan amendments and the months selected.
707	12	So this is just an example of the 2e flow schedule on the Stanislaus River [ATT:2, ATT:4]. This is a requirement in our 2009 Water Operations Biological Opinion that one of the requirements to move the water, we have to have a flow schedule. It's called the 2e flow	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding the February through June time period. Please also refer to Master Response 3.1, Fish Protection, for additional information and responses to comments regarding the benefits to fish resulting

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		schedule that designates different parts of the season, the fishery season so to speak. It gives you bits of water for outmigration cues as well as just outmigration flows. And then there's water use for fall attraction and winter rearing purposes. And this varies by water year type. And you can move water between these chunks of flows here. We've provided a detailed review of this in our recent letter to you.	from February through June seasonal flows.
707	13	In the staff report that you talked about the reservoir constraints [ATT:2, ATT:5], because that is one of the things that we found. We saw that there was a need to have some carryover for the system to not crash. And so thank you for the report this morning. We do feel that those constraints should be in Table 3 or somewhere in the Plan, so that we have those out front.	Please see response to Comment 707-5.
707	14	Getting back a little bit more to the Endangered Species Act side of things, the Environmental Protection Agency will request consultation with the National Marine Fisheries Service. And in that process, we're going to have to look at the environmental baseline of the population [ATT:2, ATT:6]. And then apply the effects of this project on the baseline. And so we did want to make it clear that as stated already -- in fact, Vice Chair, you already said this morning that the species are in trouble -- and yes our species are in trouble. And substantial efforts are going to be needed to reverse the declining trends that we're seeing. The two little graphs on the left there just show the difference between historic and current distribution of Central Valley steelhead. And you can see it's been dramatically reduced. The graph on the lower right is taken from the SED and it just shows the magnitude of the decrease in the flows. And these are just two of the factors that we're dealing with. MR. MOORE: You know, on this point this is something that we've talked about a bit during these hearings. And looking at these maps the historic range, to some extent that's not real helpful to the discussion today, right? But what's interesting is the timing. Given the map that shows where the rim dams are what I'm struck by is that those changes to the system, the physical changes, really predate the observed decline in salmon numbers by a long time. 1967 to 1991 is your baseline you use for your salmon doubling goal in the CVPIA. And with this map we're looking at here, with its rim dams, they were in within during that period. The 1967 to 1991 period, we have what I think you would say are acceptable salmon numbers. And so I think it's a real -- we have to be clear that something's happened since the physical alterations that we need to address. So I just think when we look at these historic maps, sometimes it's a bit of a distraction, because that's not really what we're aiming for. We're aiming for achieving what is in the map with the dams in it that we were able to achieve prior to the -- which is setting up our doubling goal. So I want you to help in your testimony, kind of focus us there. What are the factors that you've observed since the physical alterations? That helped? MR. MCLAIN: Yeah. MR. MOORE: Because if you look at the spikes, the testimony talks about we do see good salmon numbers during wet years and it's true, you know? But are they less than previous wet years? And so I think we need to focus the discussion a little bit about what's attainable. MS. D'ADAMO: Well, especially if you look at the system as a whole, right? I mean if you	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		look at including the San Joaquin and the Delta, the changes with respect to the entire watershed. MR. MCLAIN: Yeah, thank you. I will add that this does show a lot of resilience in salmon and steelhead. It takes time for populations to go down and go up. And when we see year-to-year changes in abundance, that can be not necessarily a population level change. It can be a specific to a watershed or specific flow conditions. But I would have to defer to our scientists on the actual population dynamics part of it. We certainly can bring more information back if needed on that.	
707	15	A little bit about the adaptive management process [ATT:2. ATT:7], we do support the idea of adaptive management process. We just have a hard time figuring out what the structure of that process would look like and we'd like to see more clear biological goals and objectives. And any adjustments of the protective measures should be linked to meet the narrative fish and wildlife protection objectives. I should probably revise that bullet to say NMFS is reluctant to spend a lot of time on the adaptive management process. We're just short on staff and a very intense adaptive management, we are concerned, would take a lot of time. And we're concerned is that we couldn't represent our fish. And so any improvements in the direction and structure would be helpful for us.	The program of implementation recognizes that new, currently unavailable, information will be needed to inform adaptive implementation, and that biological goals is one of the very important pieces of information. As described in more detail in Master Response 2.2, adaptive implementation can, however, proceed before biological goals are developed.
707	16	We did notice that there was some language in Appendix K that talked about protecting the water as it went down into the Delta [ATT:2, ATT:8]. And we would like to see that actually in Table 3 or somewhere in the Plan. We need more scientific basis for the flows at Vernalis as well. We would like to see that water protected all the way into the Delta. And presumably, if we're going with the 30 to 50 percent range and the 40 percent start, the flows would be pretty good at Vernalis assuming that's the case and that water was protected, so.	Please see response to comment 707-7.
707	17	We had our economics expert from the Science Center, Dr. Cameron Speir, review the economics analysis [ATT:2, ATT:9]. He right up front stated that, "Yes, there's a slightly less than 3 percent change in regional economic output in employment." He found some agreement with that and then but he did feel that there was an overestimate in that. And that was definitely the higher end of things. Primarily due to the context, the regional context, he looked at prior times when there were cutbacks and found that it was lower -- impacts were lower than anticipated, based on prior times.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues and for general information regarding the economic effects and economic analyses disclosed in the Recirculated SED (primarily Chapter 20, Economic Analyses). Please also see Master Response 8.0, Economic Analyses Framework and Assessment Tools, Master Response 8.1, Local Agricultural Economic Effects and the SWAP Model, Master Response 8.2, Regional Agricultural Economic Effects, and Master Response 8.4, Non-Agricultural Economic Considerations, for additional discussion of economic effects related to the plan amendments.
707	18	We would like to see a year-round flow schedule that would be better protective of the various life stages of our fish. Thank you for the carryover storage discussion this morning. We would like to see more biological goals and objectives associated with the adaptive management process, as well as clearer direction in structure. And again, we feel we should protect that water as it flows through into the Delta [ATT:2, ATT:10].	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding modifications to the plan amendments, program of implementation, year-round flow objectives, and carryover storage requirements. Please refer to Master Response 2.2, Adaptive Implementation for specific information regarding the adaptive implementation element of the flow proposal.
707	19	When thinking about flows and how they impact fish and habitat within the rivers, we were very pleased to see the shift from the previous version of the SED to the current revised version [ATT:3], utilizing a 7-day running average versus fourteen. But we would also like to highlight a couple of points that we think should be considered when the adaptive management implementation actually occurs {ATT:3, ATT:1].	Please see Master Response 3.1, Protection of Fish and Wildlife, for a justification and description of the plan amendments for protecting fish and for information about the unimpaired flow approach.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		And that's that by solely using a 7-day running average there is still the potential that with short, high-intensity storms that may only occur over a few days, that you may decouple the managed flows that you would release from the benefits you would be getting from some of the other natural benefits that come along with the storm event. But also some of the additional water supply that may come in from below the rim dams or via groundwater {ATT:3, ATT:2]. It may also limit your ability to spatially and temporally connect floodplains and other beneficial habitats. You may actually get a longer temporal connection depending on how those flows are shaped, but you may connect much to less habitat by not being able to basically add to what the system is naturally getting from storm events.	
707	20	So this next slide is a graph [ATT:3, ATT:3]. This is just a short snapshot utilizing flows from the Stanislaus in 2009 from just after the start of February to about the end of March. The white line here is based on the flow record that we have from 2009, from that time period, what would be released basically instantaneously. What's 40 percent of unimpaired flow, without any operational constraints? The blue line is what you would get with straight releases based on a 3-day average. And the yellow line is a 7-day average. So what we want to point out here in the green circle is notice the spikes that you get. The magnitude of those spikes with both the white and blue lines, versus the yellow line representing the 7-day average. Again, this is just with straight releases based on those averages. We see a difference in magnitude there of over 1,500 CFS. We also then, if you noticed the red arrow down at the bottom, potentially start to see a decoupling from the benefits you might get beyond just flow from the storm event: barometric pressure changes, cloud cover, natural turbidity, some of the other things that we believe influence fishes' success and survival and potential to outmigrate. Those cues that they naturally developed through natural storm events. Now, you potentially have missed that entire peak. And so again we are pleased to see that move from a 14-day to a 7-day average. But we would urge the Board, staff, folks to make sure that when the adaptive management process is being further refined that we think about what additional flexibilities we might be able to add to get those benefits of coupling with storm events. MR. MOORE: I appreciate this. This gets to the heart and soul of why I'm doing this job, why I'm up here, is to better engineer biology, because I get backgrounds in both. And this is a key point. Not only are you missing benefits during when the natural cues are happening, but look at that shoulder on the yellow. That's a big chunk of water that's in the name of fish that everyone who wants to see fish survive, from all perspectives, can be very frustrated with. Because that's a bunch of water that's not going to get the benefit, because we've averaged based on an operational constraint that we are imagining, okay? We're imagining that we have to stay with the 7-day approach. We can do better. In water distribution systems, in sanitary sewer collection systems, we operate better than 7-day averages. We can operate rivers in that way as well. And so I think this is a key graph. I appreciate the time you've put into this and your explanation of it. And I'm talking to my friends in the irrigation districts, in the City and	Please see Master Response 3.1, Protection of Fish and Wildlife, for a justification and description of the plan amendments for protecting fish and for information about the unimpaired flow approach.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		County of San Francisco with these comments. But I'm interested in how we -- and DWR for that matter -- how we modify our operations statewide to be more real time.	
707	21	Obviously we are very closely tied to the SED or the salmon protection objective, although we call ours the CVPIA doubling goal. But we also do an awful lot of work, or attempting to start doing an awful lot of work with some of the other CVPIA species. We have focused an awful lot on fall-run Chinook and they are obviously a very important species. But we at the program have, after 20 years, started to try to improve the science, in recent years, on some of the other species that we're charged with doubling as well. And so specifically for the San Joaquin portion of the Central Valley, one of the species that we have focused greatly on since about 2011 are white sturgeon. And this was prompted by writing the San Joaquin River Restoration Program, Fisheries Plan, Management Plan, and finding that the common belief amongst California fisheries managers was that sturgeon, both white and green, did not use the San Joaquin. And yet we had reports from anglers, for many years, from our friends at the Department of Fish and Wildlife, that sturgeon anglers were actively catching fish in the San Joaquin, well above the confluence of the Stanislaus. So not just slowly migrating a little bit out of the Delta. So in 2011 we started an effort to find and identify the population and the habitats they might be using of white sturgeon in the San Joaquin. And what we found in the past five years is that adult white sturgeon definitely do use the San Joaquin every year [ATT:3, ATT:4]. They are in the main stem every year. We have over 80 fish acoustically tagged now with 10-year tags in them. And we're able to pick them up every year, throughout the year. We've also then seen in a couple of our drier years, as much as we would like to have not experienced them they've given us a good test case, that with a very modest amount of flow that not only are those fish present, but they appear to be cueing to spawn. And we've actually documented successful spawning in a couple of fairly lean water years. So these next two slides [ATT:3, ATT:5 and ATT:3, ATT:6] are examples of that from the 2012 and 2016 years. What we have here is stream flow in cubic meters per second on the left y axis, stream flow in cubic feet per second on the right, because I could not get my sturgeon biologists not to0 leave their metric axis on there. And January through June, on the x axis. The top white line, the solid line, is flow within the main sub San Joaquin in what we call the Stanislaus Reach, which is generally downstream of the Stanislaus up until about the Tuolumne confluence. And the dashed line below it is the Merced Reach. So that's San Joaquin River flow, mostly in the Merced River Reach confluence and just slightly above. And the verticals bars that you see in the graph are documented sturgeon spawning events where we have collected actual eggs, sturgeon eggs, after these flow events. And so we put sturgeon egg mats out in the river. It is very much a needle in a haystack hunt, but we have successfully been able to find some of these and age the eggs and tie them back to the date of spawning. MR. MOORE: Real quick, just to help illustrate this flow regime, how much was sort of uncontrolled flow in these events versus really methodically controlled and determined by pulse flow agreements between the agencies and the districts? MR. RATCLIFF: Specifically, I guess we haven't done the analysis back to where they may	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. Please also see Master Response 3.1, Protection of Fish and Wildlife, for a justification and description of the plan amendments for protecting fish and for information about the unimpaired flow approach.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		have been managed flows for salmon or other species. I can definitively tell you that none of these are anything but natural flow events as far as relating to sturgeon. We've never, to this date in the San Joaquin, released any managed flows specifically to target sturgeon. MR. MOORE: I get that. But really my question was more just for the audience and ourselves really, to understand this flow regime we're looking at. How human caused is this hydrograph versus storm events that got away from us? MR. RATCLIFF: Okay. Yeah, so I can come back to you with that on 2012. I'm a little less familiar -- I will say in 2016 -- because my Direct Report who works on this -- and I had quite the wager when he told me he knew when they would spawn -- this is moving to 2016, same type of graph. That first event you see, just to the right of the March label, was completely an actual storm event. That was towards the tail end March, last year when we had a couple of days of a really strong rain event that pelted the San Joaquin Valley for about a day and a half, a pretty incredible lightning show came along with it. So he may remember. And sure enough, within three days, we had sturgeon eggs in our mats. And so we believe, at this point, that we can forecast that something along the lines of a bump of 1,000 to 1,500 CFS cues these fish and potentially something lower than that. And so, we wanted to illustrate this to show that there are other species in the system that may benefit from how we craft these spring flows. It appears that variability, on a very short time scale, in the main stem at least for sturgeon, can be extremely beneficial. With what I hope we can all agree with a fairly modest amount of water, considering some of these modeled results we've seen for protecting some of the other species.	
707	22	Our Delta Juvenile Fish Monitoring Program, one of the services components of the IEP Program and the work we do there, this graph shows a comparison of our catches in the Lower San Joaquin of Sacramento splittail from 1994 to 2012 [ATT:3, ATT:7]. So the y axis here you have an index of recruitment success. And so this is in May to June, after spring spawning events of Sacramento splittail larvae that are sampled that we believe have successfully recruited into the population. On the x axis then you have what is basically an average of the 45 days between March and May at Vernalis, when we had the 45 consecutive highest days of flow. So even there are low flow days in there, in that time period, these are the 45 consecutive highest days in that time window. And what you'll see is that in the years that we've had higher flows during that time period we have four of our five highest years of successful recruitment of splittail. Obviously, there's a large area in there between about 7,000, 7,500 CFS and somewhere in the 14,000 to 15,000 range that we don't have data points for. But again, here's another species that's benefitting from these increased springtime flows. In addition to those other species, as you've heard from Jeff and probably heard in other presentations, there are other needs for other salmonids, Central Valley steelhead and potentially spring-run Chinook, as they are reintroduced to the area through the San Joaquin River Restoration Program. I hope I've shown a little snapshot of what we believe our sturgeon needs within the spring, but there are also sturgeon needs outside of that window, as well as splittail and other native fishes.	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. Please also see Master Response 3.1, Protection of Fish and Wildlife, for a justification and description of the Plan Amendments for protecting fish and information about an unimpaired flow approach.
707	23	We agree that there should be consideration of year-round needs of fish and how flows will affect [ATT:3, ATT:8]. Especially when adaptive management comes to potentially making decisions about how you would change things in the spring and how that might affect water	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		availability or operations in the rest of the year. Additionally, building upon the comment that was made earlier, the comments from both EPA and NMFS, the downstream or ultimate fate of the water that is released is crucial, both at Vernalis but also downstream. And here's a graph of this [ATT:3, ATT:9], I guess, kind of balancing the line between Phase 1 and Phase 2 in our mind, where we have long-term work that has gone on with our office and several of our collaborators, related to VAMP. And then survival studies after it where we have coded-wire tagged fish released in the main stem San Joaquin. The blue diamonds here are coded-wire tag returns. The two red diamonds are fish that were acoustically tagged in 2012. This is flow at Vernalis measured when these fish were released and estimated survival to Jersey Point. So from the release point at Durham Ferry to Jersey Point, and a few fish released as Mossdale, through the Lower San Joaquin. And again the general trend is that when there's a higher flow, upon release in the lower main stem San Joaquin, we do see better survival of these fish albeit still relatively low and something we'd like to see higher.	plan amendments.
707	24	Appendix K currently speaks to specific objectives, whether numeric versus whether narrative [ATT:3, ATT:10]. But we have both of those in CVPIA. And I can tell you from experience, our program could tell you from experience, that trying to compare narrative goals is challenging. Especially when you bring in multiple potential beneficial uses whether those are fish-related or any other beneficial use. When it comes to make decisions about alternatives, not having potential numeric targets or goals to weigh the pros and cons against, is an extremely challenging endeavor. That goes beyond just comparing and accountability when it comes to reporting. And it goes to real-time tracking. It can be extremely challenging and ineffective to determine how effective your decision may or may not have been without some numeric target to track toward.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding the Program of Implementation and additional information describing biological goals, including temperature targets, and the relationship between biological goals and the narrative LSJR flow objective.
707	25	We think that the narrative salmon protective objective, or the CVPIA doubling goal in our world, that is reflective of what's proposed in the revised SED of the 40 percent unimpaired flow, will be very challenging to meet. We certainly believe that a move towards recovery and better conditions is there, but we've done modeling in the past. A report from AFRP in 2005 for the three tributaries showed our estimates to show what it would take to see a 53 percent increase towards the doubling goal. So think of it as just slightly over half of doubling. You'll see in wet and above normal years, we're in the 30s, up towards 38 percent on the Stanislaus and Merced in an above normal year. We get beyond that and we start to see, at least from our modeling results, unimpaired flow rates that would be required at 50 percent and above, up towards 60 percent like we've heard from other folks that have done these analyses, to truly move towards the doubling goal. And so while we understand the need to balance benefits to all of the different things being considered by the Board under this SED, we also want to convey how important it will be to think about how this 40 percent of unimpaired flow is utilized and how flows may be crafted to receive the maximum benefit if we are truly going to see a move towards doubling.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues. Please see Master Response 3.1, Fish Protection, regarding justification and description of the plan amendments for protecting fish, including discussion of the biological goals such as population doubling. Master Response 3.1 discusses the unimpaired flow approach and the role of adaptive implementation in achieving the goals. Also refer to Master Response 2.2, Adaptive Implementation, for more detailed discussion on adaptive implementation of the plan amendments.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
707	26	VICE CHAIR SPIVY-WEBER: And are you considering the habitat enhancements that -- the use of these flows for habitat enhancement. Is that what you're referring to? MR. RATCLIFF: Absolutely. I mean at this point in 2005 -- and so things have changed -- we would need to update this to give your our current estimate of real numbers. That was with the habitat work that had been done by our program and others at the point. And the assessment of other areas that would be activated by flow releases that aren't active habitat restoration. There's been work done since then that we would need to incorporate. Obviously, the bread and butter of our program is to continue to work on habitat restoration and so we very much appreciate through the hearings, hearing that folks believe, a lot of folks believe that a combination of flows and habitat restoration, are really what is needed along with addressing other potential limiting factors. But at this time yes, this basically was real time in 2005, so these numbers would have changed some certainly.	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.
707	27	We've moved our narrative doubling goal very similar to your salmon protection objective. Two numbers, both for Central Valley-wide, which you have on the left here for all of the species and runs of Chinook that we work with, the CVPIA. And then just a snapshot, this is not the full table, but we have those targets natural production targets by watershed. So the number that was shown there in the EPA presentation was the combination of those bottom three numbers, that 78,000-ish fish that would need in the San Joaquin Basin for doubling comes from the Stan, Tuolumne and Merced. And so this is just to show you that we really had to go here early on to be able to report tracking, to be able to analyze what we might do in one watershed over another, and we do this Central Valley-wide.	Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.
707	28	As Phase 2 rolls out this is something that we're going to want to think about if we're going to really be able to incorporate adaptive management. So finally I wanted to hit just a little on adaptive management [ATT:3, ATT:13], and again we're in the middle of this process at CVPIA, so it's near and dear to our heart right now. At least you're not doing it with a 20-year old program. We're having to change horses in mid-stream. And it makes an interesting extra layer. At its face, adaptive management looks awful simple to a lot of folks I think. And this is a very simple diagram that comes from our Department of Interior technical guide on adaptive management. And the idea is that you identify a problem, you design something to fix that whether it's a specific project or a program, or a plan. You go and implement that, monitor it, evaluate the data you've got in front of you and adjust how you manage. But it's a lot more complex than that. And every one of those circles requires an awful lot of effort. And the reason that I brought this here today was to tell you that for those of us in the room that are scientists and are exposed to adaptive management early on, we think about this from how it's implemented as a scientist, right? How you would design your project, your monitoring plan, how you would pay for and collect data? How you would analyze that data and how you would turn that analysis into something you can give to a manager to help him make a better decision? But I'm learning right now, in real time, with CVPIA, that there's a whole other circle to this	The State Water Board recognizes that adaptive implementation is complex, and will take much effort. The program of implementation is designed, however, to work even if relatively little effort is expended. Absent very little effort of anyone other than State Water Board staff, the STM working Group will be able to develop and implement adaptive management. Adaptive management will however benefit from participation by a wide range of stakeholders with relevant expertise. As stated in Appendix K: The State Water Board will seek participation in the STM Working Group by the following entities who have expertise in LSJR, Stanislaus, Tuolumne, and Merced Rivers fisheries management, hydrology, operations, and monitoring and assessment needs: the DFW; NMFS; USFWS; and water users on the Stanislaus, Tuolumne, and Merced Rivers. The STM Working Group will also include State Water Board staff and may include any other persons or entities the Executive Director determines to have appropriate expertise. The STM Working Group can operate effectively even if comprised only of State Water Board staff. Master Response 2.2, Adaptive Implementation, provides additional description and examples of how adaptive management may proceed and the bounds under which it may do so.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		and that's the governance and the logistics of it. And especially as you get into a large program and move away from adaptive management on a small scale, you have to think about the time and the resources. And so starting with measurable goals and objectives from the front end, narrowing the decision space, realizing that a huge part of adaptive management is to foster creativity. And to be able to analyze different proposals and decide what you think will help you best achieve your objectives and lean from that and adapt through time is extremely important. But what we learned at CVPIA, I think in the last four years -- the last two years extensively where we put in an awful lot of time and resources and we've had an awful lot of partners that have come to speak to you, a lot of the same folks participating in our processes -- is that without having some of that governance and some of those larger 30,000-foot level sort of side boards and general objectives on the plate for those folks to help narrow their decisions base, we've spent an awful lot of time and resources with those folks. And so we've come an awful long ways in two years, but I think that this is something that we felt like in our review of SED really stood out to us. That we would urge you to think about how you work with the Board or through other folks, to give the SED and working group and other folks who'll be helping you, devise and implement this adaptive management plan some sideboards. Something more about objectives that you really want them to consider when developing the models and the decision process and how they might implement an adaptive management program.	
707	29	The general recommendations that you will see in [The U.S. Fish and Wildlife Service] letter {ATT:3, ATT:14] are to, "Consider fish and habitat flow related needs for all of the native species throughout their life cycles." And we feel this has been done fairly well in the SED. There's been an awful lot of work done here and we appreciate that. But we do have some other species that we do think some recent work has shown will also likely be impacted, and in many cases benefited, by implementation of this objective and exactly how it's been implemented. And should be considered when we're thinking about adaptive management for the system, not just for any of the individual species or runs. Secondly, to think about where we can, "Define measurable goals and objectives," more. To really jump start where we can jump off with our partners on adaptive management and further define the process, the governance as much as possible, and the decision space that folks might have in that. I think hopefully, we will be in a lot of the same situation that Jeff said for NMFS, other than with through CVPIA we have local habitat restoration coordinators that would very much want to be involved in the process. But our ability to expend those resources and assist would be greatly improved with a little more guidance on the front end, I think. So with that, I'll -- this is a San Joaquin River sturgeon [ATT:3, ATT:15]. And if you're less than 29 years old in this room, this fish is older than you, just over eight feet.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding incorporation of other species and the Program of Implementation which addresses adaptive implementation, biological goals, and monitoring.
707	30	I'm an Environmental Program Manager and oversee our fisheries projects in the central region and I'm headquartered out of Fresno. And one of the projects I oversee is our Lower San Joaquin River and San Joaquin River Tributaries Anadromous Fish Restoration and Research Project. We acknowledge that this has been a long and trying process for you all and that you have a difficult challenge before you to balance competing beneficial water uses. That said, as the	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		trustee agency for California's fish and wildlife resources, and we're charged with conserving them for future generations, we're compelled by the science that's been brought forward to date to conclude that the San Joaquin River ecosystem and the south Delta ecosystem is in decline and that change is needed. And that we agree with the SED that a revised flow regime is needed.	
707	31	Reduction and flattening of the San Joaquin River's hydrographs have altered the physical, chemical and biological characteristics of the San Joaquin River, and its tribs {ATT:4, ATT:1]. And have created habitat conditions that have compromised anadromous fish by making them sick, injured, unhealthy and susceptible to predation. [ATT:4, ATT:2] Reduction and flattening of the hydrographs has favored the proliferation of non-native species, substantially contributive to the decline in anadromous fish population abundance, making these populations non-resilient to stochastic mortality events, such as ocean conditions. A return to a more natural flow regime hydrology would reverse these trends and could preclude the need to develop a TMDL [Total Maximum Daily Load] for water temperature impairment, which is now legally required given a water temperature impairment listing. [ATT:4, ATT:3] A more natural flow regime would help support a portfolio effect for fry, parr and smolt contribution to adult production via a presentation that was given to you by Dr. Sturrock and Dr. Johnson earlier in this workshop process. And adding more adults being produced in the San Joaquin would actually level, if you will, or more level the adult Chinook production in the fall -- overall Central Valley fall-run ESU. And lastly, a natural flow regime would create a boost in natural production thereby reducing the need for hatchery fish. MR. MOORE: Before you go on, this is the first that the TMDL issue's been raised in the five days, could you quickly tell us which reaches and are they proposed listings or just listing for temperature impairment? MR. MARSTON: They're existing listings for temperature impairment. And on the main stem San Joaquin, it goes from the confluence of the Merced downstream to I want say Vernalis or Mossdale, I forget the exact demarcation. And then each of the three tribs on the Merced, the Tuolumne and the Stanislaus River, it goes from the lower rim down, down to the confluence.	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.
707	32	Regarding implementation, implementation should be based on a systematic watershed-based approach and should focus on achieving connectivity between tributary watersheds and the Bay-Delta to protect anadromous and non-anadromous native fish species. Regarding monitoring, a strong effective monitoring program will be indispensable to managing and evaluating implementation [ATT:4, ATT:5]. Progress towards goal attainment is needed and a comprehensive monitoring program is a pathway to accomplish this. Regarding adaptive and collaborative management, the Department supports collaborative adaptive implementation of a block of water. Recognizing that there is a distinction between annual real-time operations and longer-term adaptive management. Decisions on use should be tied to achieving biological goals and objectives and be coupled with	Please refer to Master Response 2.1, Amendments to the Water Quality Control Plan, Master Response 2.2, Adaptive Implementation, and SED Appendix K for responses to comments and more information regarding the program of implementation and monitoring. The establishment of flow objectives based on a 7-day running average percent of unipaired flow achieves this desired connectivity. Per Appendix C: The State Water Board has determined that higher and more variable inflows during the February through June time frame are needed to support existing salmon and steelhead populations in the major SJR tributaries to the southern Delta at Vernalis. This will provide greater connectivity to the Delta and will more closely mimic the flow regime to which native migratory fish are adapted. This value of this overall connectivity is increased by allowing the required percent of unimpaired flow to be managed, within limits established by the program of implementation, as a block of water. This is

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		effectiveness monitoring. Regarding strengthen decision making, decisions on implementation of flow, say percent of unimpaired flow and non-flow, should be tied to achieving clearly defined fish and wildlife narrative objectives [ATT:4, ATT:7]. This includes decisions on adaptive adjustments to the February through June time period. That includes flow shape by, for example, percentage of unimpaired flow and also flow shifting. Regarding governance [ATT:4, ATT:8], the Department supports flexibility and alternatives to the STM work group where there are voluntary agreements in place. The Department supports strong leadership and facilitation by the Board for the STM work group including such things as early establishment of the STM group, i.e., within 180 days of the adoption of the amendment. And development of government structure like operating rules -- how it's going to operate, timing for products, things like this. Also, focus participation of the STM so that the group remains affective or to consider subgroups or forums to allow additional stakeholder and water user involvement. Lastly, require use of biological goals to guide and inform adaptive management [ATT:4, ATT:6].	described in Appendix K and also in Master Response 2.2, Adaptive Implementation. Master Response 2.2, Adaptive Implementation, also provides more information on the adaptive implementation process and STM Working Group structure and governance. Per Appendix K, the State Water Board recognizes the potential need for STM Working Group subgroups to work on specific tasks: "Subgroups of the STM Working Group may be formed as appropriate and State Water Board staff may also initiate activities in coordination with members of the STM Working Group."
707	33	Regarding voluntary agreements, the Department appreciates that the Board recognizes the efforts to secure collaborative voluntary agreements. Voluntary agreements should accelerate implementation while also increasing the synergies of individual actions both flow and non-flow throughout the watersheds, according to an agreed upon schedule of implementation [ATT:4, ATT:9].	Please see Master Response 1.1, General Comments, regarding voluntary agreements. Voluntary agreements can be submitted to the Board for consideration at any time. The SED Executive Summary, ES 3.1 Lower San Joaquin River Flow and Southern Delta Salinity Proposals, and Appendix K, Voluntary Agreements, address the minimum standard the agreements must meet for Board consideration including "measures that meet or exceed the proposed objectives and protect fish and wildlife uses".
707	34	Regarding the Board's use of SalSim, we acknowledge and recognize the Board used SalSim and found issues, that is in better stated errors resulting in less fish than would be expected given empirical data [ATT:4, ATT:10]. And I as the Project Manager for the Department would like to apologize to the Board for the fact that this model does in fact have a couple of errors. I'm going to take ownership here. So we found that the egg mortality is excessive, it was killing off eggs in the fall during the spawning time period only over a few days. And it should have been occurring over a much longer time period, say two weeks to a month. So that calculation in the model has been fixed, if you will. It's corrected to behave as it should given the underlying empirical data that was used to inform that mathematical calculation. Then in the spring, juvenile mortality was insufficient, because flow level was overriding the effects of temperature. So that was also fixed and errors have been corrected and the detail of this will be provided to the board in our comments here in mid-March. We've recalibrated the SalSim model. And again the detail will be provided in our formal SED comments.	The comment is noted. Please see Master Response 3.1, Fish Protection, regarding the use of SalSim and discussions of its assumptions and limitations.
707	35	This is a graph showing Mossdale water temperatures amongst other things [ATT:4, ATT:11]. And there's a lot of information here. And this comes from the Board's HEC-5Q water temperature model. And basically what you see, it's kind of hard for the colors here, but you'll see the sinuous lines showing water temperature prediction at two places, Vernalis and at Mossdale. And the purple line, the elevated line for temperature on the right axis -- and this is for the baseline Board's model run -- and it shows that temperatures can exceed	Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. Please also see Master Response 3.1, Protection of Fish and Wildlife, for information about the SalSim model.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		100 degrees Fahrenheit during the February through June time period. And then on the left y axis, looking at flow in cubic feet per second, you'll see a green line that kind of moves up and down a bit between 0 and 5,000, say at the 2,500 CFS range for the years January of 2000 to about the end of 2004 -- excuse me -- end of 2003. And then basically it bottoms out to near zero. So the flows in this particular baseline at Mossdale go to near zero. And all at the point that I wanted to make here with this is that the HEC-5Q water temperature model provides the inflow and the water temperature data to run SalSim. So if the flow data and the temperature data are inaccurate, then by default regardless of the issues I said earlier with SalSim, SalSim's error is going to be -- the output is going to be in error as well. So I don't want to belabor this, other than to say that in the process of developing decision support tools, finding and fixing bugs is a standard operating procedure. That's just how they go, you know? Our cell phones, our software, we're getting patches all the time. It happens. Do we want it to happen? No, but we fix it, we find it and we fix it [ATT:4, ATT:12].	
707	36	A combo of elevated water temps and reduced flows at Mossdale, a lack of results and substantial juvenile salmon mortality for not only salmon entering the Delta, but also for salmon survival through the Delta. And adult salmon production estimates as I said are likely substantially lower than they should be, given the factors that we've just discussed. There's been some talk about the importance of June flows [AATT:4, ATT:13]. So what we have here, a lot of action going on here, but what we have a graph depicting on the x axis the period of time in early April 2011 through the end of June 2011. And then on the y axis estimated juvenile Chinook salmon catch at Mossdale. And this represents the -- we heard some comments earlier about the District's rotary screw trap. Well, the Department has been conducting a Mossdale/Kodiak trawl to develop an index of outmigrating fall-run Chinook salmon juveniles for the period April through June, for the past 30 years. And we see here in this particular that there's a big red box over there and you can see the caption for yourself. The smolts leave the San Joaquin River in June when flow is provided. And then just in the red there, it might be hard for folks to see, but just remember the juvenile portfolio effect described by Drs. Rachel Johnson and Dr. Anna Sturrock in that all life states are important. We're trying to protect the genetic integrity of fall-run Chinook salmon. And just as important, and maybe not more important for fall-run, is late fall-run. Because they come in and spawn in the San Joaquin River tribs in say the late December/January time period. And given five or six months for the eggs to hatch and juveniles develop and out-migrate out they're fallen right in to this June time period. So it's critical for this species of Chinook salmon. And then here's another example of a wet year, in 1999. I don't want to belabor the point other than to say that in June, we still have a fair amount of juveniles outmigrating from the San Joaquin River tribs making it to Mossdale, and are captured here and depicted here in our graphic [ATT:4, ATT:15].	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. Also see Master Response 3.1, Protection of Fish and Wildlife for information regarding seasonal flows from February through June.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
707	37	When we have more San Joaquin River tributary flows in the spring, we get more juvenile salmon entering and exiting the Delta, which leads to more salmon production. Does it happen every single year? No. We get things like ocean crashes, but the data collected to date indicates that probability is, is that when you have more spring flow, you're going to have a greater number of juveniles. And when you have a greater number of juveniles, they're going to survive at higher rates, to and through the Delta. And we're going have more adults being produced for ocean fisheries and then for escaping spawners to come back to spawn in the fall. So we might ask the question, is flow important in light of the SED [ATT:4, ATT:16]. Again, a busy graph here. On the x axis we have a number of years, 1995 through year 2015. And what it's depicting here is the naturally produced, or wild produced, fraction of escapements. So this is -- the data for this is from the Department's fall-run Chinook salmon escapement surveys in both the Tuolumne, which is the red line, and in the Stanislaus, which is the blue line. And the way that we fractioned out on an annual basis the number of wild fish or naturally produced fish, versus the number of hatchery fish, is to take a look at otoliths, the little ear bones from the fish after they've spawned and died. Then we can capture them in a survey, and then conduct analysis. And this analysis is paid for by the Fish and Wildlife Service, conducted by UC Davis, and also paid for TID. And my apologies to Modesto Irrigation District. I understand that they are they were also a funder for the analysis of otoliths. So what we have are basically three categories here, looking up the y axis from the bottom to the top. We had a wet-year period, a dry-year period, and then I'll get to that far-right period in a moment. But basically the Tuolumne Basin is twice the size of the Stanislaus and had twice the annual runoff approximately. And we see in wet years is that we get a response in terms of natural production on the Tuolumne when the Tuolumne's actually releasing water. And it far, far and away exceeds the number of fish that are being produced, those naturally produced fish that are being produced on the Stanislaus. And then we go into the dry-year period, to the one in the middle, and we see that production crashes if you will in both cases, but it's better on the Stanislaus. And it's known that in dry years the instream flow schedules on the Stanislaus are better than on the Tuolumne or actually even on the Merced. And that just has to do with the way the agreements have been worked out through the years. But there's been another interesting thing that's happened over the last 20-to-25 years. And that's depicted by that red dash line, which actually exceeds into the far right, but just for illustrative purposes I kept it where it is. And just to show that there's been non-flow restoration actions that have occurred both in the Stanislaus River Basin as well as in the Tuolumne, but they have been predominantly being constructed in the Tuolumne River Basin downstream of La Grange Dam. By the order of tens of millions of dollars greater in magnitude in terms of effort and expenditure and construction spent on doing non-flow habitat restoration measures in the Tuolumne. So now I'm going to go to the far right column there. So if non-flow actions are driving production than that blue line that starts to rise in the more recent time period should be red, not blue. But we find the exact opposite. So the question is, "Well, what happened?" So	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		we looked at that to try to answer that question. So I know there's a lot of words here. just go the graph itself and what it's depicting. And this shows the years 2009 through 15. And then again, the natural salmon adult escapement on the right y axis. And then you see the Tuolumne in the red and the Stanislaus in the blue. And these data are from FishBio Weir Count that the districts pay for. And then again the on/off analysis paid for by TID, Fish and Wildlife Service, conducted by UC Davis, and also the Department of Fish and Wildlife providing the otoliths. And again my apologies to Modesto Irrigation District for not listing them as a funder. But we again asked ourselves well what happened here? So we've effectively -- and you can see here, I'll read them for you here -- so we effectively had in situ experiment occurring in the SJR tributaries that allowed us to evaluate emphasis on flow versus emphasis on non-flow. And we found that the Delta BiOp operation and RPAs flow increases were implemented in approximately 2009. This effectively brought spring flows in the Stanislaus to approximately 40 percent of unimpaired. And we recognize that there's a little bump in production in 2011 for the Tuolumne, which gave it some reprieve. But otherwise the populations have generally dropped. And I'm talking about naturally produced populations. However the Stanislaus population has shown a steady rise throughout.	
707	38	Restoration actions primarily focused on flow improvements are by far out-producing those results produced by emphasis on non-flow actions. MS. D'ADAMO: Do you include the non-flow measures that have been implemented on the Stanislaus? MR. MARSTON: The -- MS. D'ADAMO: So on the Tuolumne you're looking --- MR. MARSTON: The answer is yes. We recognize that non-flow actions have occurred on the Stanislaus. But the actions that have occurred on the Tuolumne far outweigh the amount of restoration action that's occurred on the Stanislaus in the non-flow sense. MS. D'ADAMO: And what non-flow measures are you considering on the Tuolumne? MR. MARSTON: Gravel reintroduction, floodplain improvement, riparian improvement, gravel mining or gravel pit fill-in. Those are the ones that come to mind immediately. I mean, we could provide a whole list to you in our comments and probably will. MS. D'ADAMO: I would just -- I think we should get maybe more information on this, because it's my understanding that the non-flow measures that have been implemented on the Stan, Honolulu Bar and I forget the name of the other project, but they are successful, non-flow restoration projects. And -- MR. MARSTON: And we are not -- if I might finish, if you might -- we're not saying that they're not successful. We're just saying that the non-flow actions by themselves are not as productive as they could be in the absence of flow increases. And that restoration actions tied to a revised flow regime would provide a multi-pronged approach to reverse a decline. But absent an increase in flow they won't by the selves create substantial improvements in	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		anadromous fish populations. Restoration actions augment flow benefits, but they do not replace them. MS. D'ADAMO: Right, so the projects on the Tuolumne, I think, a couple -- one in particular that was quite costly -- the Special Pool? MR. MARSTON: SR9 and 10, Special Request 10? MS. D'ADAMO: Right. I mean it is quite costly to move the gravel into this area. And it seems that that was not a very successful project, because the pool is quite large. And there still maybe flow challenges, but also predation hot spots in that area. And so I guess I'm just pointing out -- I don't know the answer to these non-flow issues -- but when I've been out on both rivers the non-flow measures that were implemented on the Stan have been -- and I've been out there with representatives from the irrigation districts, but also the NGO community -- that those are successful non-flow projects. And on the Tuolumne not so much so. And so I would expect through adaptive management and some of the discussions hopefully that you'll be having as part of the settlement discussions and otherwise, that there'd be some lessons learned about what types of projects might be the ones that you'd want to focus on, in terms of the non-flow measures. And so I don't know if this is an apples-to-apples comparison.	
707	39	In closing [ATT:4, ATT:17], the Department appreciates the State Board's efforts. At the core of the Department's interests throughout this process, as the state's trustee agency for fish and wildlife, is the undisputed fact that the Bay-Delta ecosystem is in crisis. The Department will move ahead tirelessly to work with the State Board and other stakeholders to develop solutions to reverse current trends, while reasonably protecting all beneficial uses of water within the framework identified in the SED and proposed amendments.	Please refer to Master Response 2.1, Amendments to the Water Quality Control Plan for a discussion regarding the establishment, membership and structure of the STM Working Group which will include the California Department of Fish and Wildlife, California Department of Water Resources, National Marine Fishery Services, and United States Fish and Wildlife Service.
707	40	D'ADAMO: I have one more question. VICE CHAIR SPIVY-WEBER: Sure. MS. D'ADAMO: Okay. So I can't tell this slide number, but the June flows -- one, two, three, four -- maybe back up five slides -- on the importance of June flows. So, and I do recall the testimony that Dr. Rachel Johnson and Dr. Anna Sturrock provided and this is an accurate quote, but there's other things that they said as well. Mainly that it depends on the year type and possibly on better monitoring to determine whether or not the smolts are present as to whether or not June might be an important use of water. And so just looking at here what you're saying on the importance of June flows, and we've heard a lot about flow shifting, are you saying that this unimpaired flow regime -- it would be best to implement it in June -- to actually utilize the flows in June? MR. MARSTON: I'm saying or depicting -- the Department's depicting here that there is advantages to fall-run Chinook salmon production by having flows in June. MS. D'ADAMO: Okay. So I'm trying to, you know, I understand in a perfect world it sounds like what you're saying is June flows are important. But my question is if you were to have	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		this opportunity for flow shifting -- and you kind of have to rank at what time the Department would recommend the use of the flows, especially with carryover storage, et cetera -- would you actually use June for those flows? Or would you suggest to shift doing some -- using the unimpaired flow block of water from June shifting it around to a different time frame? MR. MARSTON: And you can imagine that's a complicated question that you've asked and so the immediate thought that comes to my mind is that it depends. And it depends on a real-time management sense, right? Because effectively what we're trying to do, based on what we've seen in the past, is that we have a population that crashes, all right? Crashes in every dry-year period and rises up again in a wet-year period. And what we're trying to do is reduce the crash that occurs. In other words dampen the peaks and also shorten the duration between the two maximum development time periods. So it could be that on -- yes, maybe when a decision's made that we can forego flow in June in a particular year, say a current year, by way of example to accomplish some other biological objective that we're trying to achieve. In order to keep the population from crashing we may choose to do that. And I can't think of one off the top of my head, but the opposite decision might be made. You know, it's maybe more important from a genetic integrity perspective to allow a greater number of juveniles to leave the basin in a particular year. And so therefore June flows aren't important or we might decide that on a late fall-run, we've got to have some June flows in a particular year. So it depends.	
707	41	In my travels to the different rivers and learning about the different studies that have been conducted, I thought it was compelling there's some developing science around temperature tolerance. And I asked Mr. Grober on November 29th, and staff, if these temperature thresholds we're using, that are often derived from science in the northwest, if they were refined based on science in these tributaries, which is the southern-most runs that may have more temperature tolerance. Would some of the thresholds change in terms of the flow needed to achieve temperature thresholds that protect the salmon and achieve biological goals. So and the answer was, "Yeah, sure. If those thresholds change you don't need as much flow to meet temperature, right, if the thresholds are higher." So I just wanted to give you the opportunity to comment on the state of the science on temperature tolerance in the Stanislaus, Tuolumne, and Merced rivers and Lower San Joaquin and what you think of it. And where that's going and some problems with it that you see or some science advancements that you're seeing. MR. MARSTON: Well, I'm not a scientist, but a little aware that that is hotly debated. And we haven't seen any evidence to go with anything other than the existing criteria we're using. MS. FORESMAN: So I do know, well we have encouraged, through our work with the Delta Stewardship Council, getting more science for thermal plasticity. Tying to really figure out what are the thermal tolerances for Central Valley Chinook. And I think that the temperature criteria you're referring to are EPA's Region 10 temperature criteria that were	Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments. Refer to Master Response 3.1, Fish Protection, regarding water temperature and for discussion of the use of the EPA water temperature criteria.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		developed in the Pacific Northwest. And we have a little bit of science on the Central Valley Chinook and I think O. mykiss as well. But it is just really starting to get going. The temperature guidance that was developed in the Pacific Northwest took ten years. It did all kinds of different types of studies and the newer science that we have now is using physiology and different tools then were used in the Region 10 guidance. So I definitely think it's worth exploring to figure out -- I certainly think it's worth exploring to figure out is thermal tolerance for the southern-most part of the range showing physiological plasticity in these species? And trying to figure out what are appropriate temperature bounds for each one of the life stages that are important in this system. So I certainly thing that that's worth looking into, but I don't think it's a short exercise. It would take many years and lots of different types of studies to really come up with a range that you have confidence in managing with. MS. D'ADAMO: Well, that's a good question, because I think TID in collaboration with -- I don't remember who the science -- UC Davis? MS. FORESMAN: It's Nann Fangue at UC Davis. And if I'm thinking of the right study, and she's doing temperature physiology studies with a new tool. You kind of put a fish on like a -- it's almost like a little fish treadmill, sort of thing. And you expose them to different temperatures and you figure out their thermal tolerance. And they did O. mykiss, so they did steelhead. And then we paid Nann Fangue to also look at fall-run Chinook salmon and we used hatchery fish in the laboratory. That's one of the reasons you really need multiple studies, because well-fed fish in the laboratory perform a lot better than starving fish in the river. So and that's just one of the examples of needing to look at different physiological metrics, such as growth and what are egg tolerances, things like that. So that you get a broad picture for each life stage to have a range that you're confident is protective. Did that answer your question about it? Okay. Thanks.	
707	42	[ATT:1: U.S. Environmental Protection Agency presentation dated January 3, 2017 titled "SWRCB Bay Delta Water Quality Control Plan Phase I Recirculated Draft SED Comments"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	43	[ATT:1, ATT:2: PowerPoint slide labeled "Clean Water Act & Beneficial Uses"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	44	[ATT:1, ATT:3: PowerPoint slide titled "Flow Standards to Protect Aquatic Life"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	45	[ATT:1, ATT:4: PowerPoint slide titled "All Season Narrative Objective & Protection for Fish and Wildlife"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	46	[ATT:1, ATT:5: PowerPoint slide titled "Flow Standards and Success"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	47	[ATT:1, ATT:6: PowerPoint slide titled "Flow Standards & Success"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
707	48	[ATT:1, ATT:7: PowerPoint slide titled "Flow Standards & Success"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	49	[ATT:1, ATT:8: PowerPoint slide titled "Adaptive Management"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	50	[ATT:1, ATT:9: PowerPoint slide titled "Monitoring, Assessment, and Science Program"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	51	[ATT:1, ATT:10: PowerPoint slide titled "Summary"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	52	[ATT:2 National Oceanic and Atmospheric Administration presentation dated January 3, 2017 titled "Summary of Comments on Substitute Environmental Document for San Joaquin River Basin Flows of Bay-Delta Plan"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	53	[ATT:2, ATT:1: PowerPoint slide titled "NOAA Fisheries Role and the ESA"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	54	[ATT:2, ATT:2: PowerPoint slide titled "40% Default and 30-50% Range"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	55	[ATT:2, ATT:3: PowerPoint slide titled "Year-round Flow Schedule"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	56	[ATT:2, ATT:4: PowerPoint slide titled "Example: 2-E Flow Schedule"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	57	[ATT:2, ATT:5: PowerPoint slide titled "Set Standards for Reservoir Constraints"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	58	[ATT:2, ATT:6: PowerPoint slide titled "Environmental Baseline"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	59	[ATT:2, ATT:7: PowerPoint slide titled "Adaptive Management"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	60	[ATT:2, ATT8:: PowerPoint slide titled "Protecting Flow through Delta"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	61	[ATT:2, ATT9:: PowerPoint slide titled "Agricultural Economics"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	62	[ATT:2, ATT:10: PowerPoint slide titled "NMFS' Summary of Recommendations"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	63	[ATT:3: U.S. Fish and Wildlife Service presentation dated January 3, 2017 titled "Bay-Delta Plan Phase 1 Revised SED Review"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	64	[ATT:3, ATT:1: PowerPoint slide titled "USFWS Phase 1 SED Review"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
707	65	[ATT:3, ATT:2: PowerPoint slide titled "Timing and Extent of Flow"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	66	[ATT:3, ATT:3: PowerPoint slide titled "Timing and Extent of Flow"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	67	[ATT:3, ATT4:: PowerPoint slide titled "Multi-species Benefits (Sturgeon)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	68	[ATT:3, ATT:5: PowerPoint slide titled "Multi-species Benefits (Sturgeon)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	69	[ATT:3, ATT6:: PowerPoint slide titled "Multi-species Benefits (Sturgeon)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	70	[ATT:3, ATT:7: PowerPoint slide titled "Multi-species Benefits (Splittail)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	71	[ATT:3, ATT:8: PowerPoint slide titled "Year-round Fish Needs and Fate of Water"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	72	[ATT:3, ATT:9: PowerPoint slide titled "Year-round Fish Needs and Fate of Water"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	73	[ATT:3, ATT:10: PowerPoint slide titled "Measurable Goals and Objectives"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	74	[ATT:3, ATT:11: PowerPoint slide titled "Measureable Goals and Objectives"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	75	[ATT:3, ATT:12: PowerPoint slide titled "Measurable Goals and Objectives"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	76	[ATT:3, ATT:13: PowerPoint slide titled "Adaptive Management"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	77	[ATT:3, ATT:14: PowerPoint slide titled "USFWS Phase 1 SED Review"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	78	[ATT:3, ATT:15: Picture of two men with a San Joaquin River Sturgeon]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	79	[ATT4: California Department of Fish and Wildlife presentation dated January 3, 2017 titled "Public Hearing on the Amendment to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and supporting Draft Revised Substitute Environmental Document"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	80	[ATT:4, ATT:1: PowerPoint slide titled "Hydrograph (1 of 3)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	81	[ATT:4, ATT:2: PowerPoint slide titled "Hydrograph (2 of 3)"]	The commenter provided this attachment for reference purposes in support of their comments. Those

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
			comments are addressed in these responses to comments; therefore, no additional response is required.
707	82	[ATT:4, ATT:3: PowerPoint slide titled "Hydrograph (3 of 3)"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	83	[ATT:4, ATT:4: PowerPoint slide titled "Implementation"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	84	[ATT:4, ATT:5: PowerPoint slide titled "Monitoring"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	85	[ATT:4, ATT:6: PowerPoint slide titled "Adaptive, Collaborative Management"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	86	[ATT:4, ATT:7: PowerPoint slide titled "Strengthened Decision Making"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	87	[ATT:4, ATT:8: PowerPoint slide titled "Governance"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	88	[ATT:4, ATT:9: PowerPoint slide titled "Voluntary Agreements"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	89	[ATT:4, ATT:10: PowerPoint slide titled "SWRCB's use of SalSim"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	90	[ATT:4, ATT:11: PowerPoint slide titled "Mossdale Water Temperature"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	91	[ATT:4, ATT:12: PowerPoint slide titled "Model Tool-Take Home"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	92	[ATT:4, ATT:13: PowerPoint slide titled "Importance of June Flows - 2011"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	93	[ATT:4, ATT:14: PowerPoint slide titled "Importance of June Flows - 1999"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	94	[ATT:4, ATT:15: PowerPoint slide titled "Is Flow Important?"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	95	[ATT:4, ATT:16: PowerPoint slide titled "Is Flow Important?"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
707	96	[ATT:4, ATT:17: PowerPoint slide titled "Closing"]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
708	1	I'm here because throughout high school and parts of middle school, I was given the wonderful opportunity to spend time in the Bay-Delta every summer with my nana and Sea Scout group learning fishing and doing various activities. I believe the Delta deserves to be preserved or at least conserved not only for future kids like me, but for also for the fish and	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		ecosystem that resides in the Bay-Delta and the Lower San Joaquin. Now, I understand that agriculture is a huge chunk of California's economy and is a large employer. However, around 2,200 salmon farmers will lose their jobs if the flow of the San Joaquin remains this low. It's also important to note that the highly-feared agricultural job losses would not be caused by allocating more water towards the watershed, but instead would be caused by those who could have saved thousands of jobs and water by investing in irrigation technologies, farming high-value water efficient crops, or implementing numerous other strategies with long-term payoffs. Everybody who was here today, or has voiced their opinion past hearings, values the Bay-Delta and its water at some significant level. No one wants the Delta destroyed. The reallocation of water would restore the watershed's proper chemistry diminishing the growth of cyanobacteria and increasing oxygen levels allocating or allowing the ecosystem to flourish and naturally maintain its health. These reasons, restoring the chemical balance, lowering agricultural waterways, saving the salmon, and preserving it for recreational use are why it is so important to conserve this water source to the quality it needs to be at by reallocating water towards it. Thank you.	
709	1	I read a book called "A Short History of Progress," by Ronald Wright. It's a very, very good book, highly recommended. He describes a situation called a progress trap where innovations create new problems to which society is unable or unwilling to solve. Or, inadvertently create conditions that are worse than what existed before the innovation. Some progress traps that he went through in the book, two of them were Sumer, current day Iraq, the confluence of the Tigris and Euphrates rivers. And over millennia a large irrigation system, overgrazing, and land clearing resulted in desertification and soil salination. So we take a look present-day Iraq, it is a dry dusty desert. Thousands and thousands of years ago it was covered with trees and it had a very fertile Delta there. So there's definitely some parallels to California. Easter Island, another one, logging to make statues and boats destroyed the ecosystem and lead to war and collapse and everyone left the island. Another one is the Aral Sea, the fourth largest lake worldwide. The 1950s and '60s, Soviet agricultural innovations allowed for the diversion of the two chief water sources, two rivers, to grow cotton in the desert, which sounds very similar to Kern and Westlands. The Aral Sea experienced a 90-percent reduction in size and a 10,000 percent increase in salinity. And it's an absolute ecological disaster today. You know we're dealing with, in a larger scale here, reductionist management. You know, forgetting to look at the whole picture. So what we're asking today is for the Board is to set policy to manage agriculture in a living ecosystem. It's necessary to understand that we're living and farming in the context of an estuary. Working with nature instead of against it, will benefit the region in the long term. And recognizing Kern and Westlands and their impact is imperative. You know we're dealing with the southern Sierras all the way up to Mount Shasta is one system. We like to break things up and look at little pieces of them, and that's what we're doing today, which is what	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		we're doing. But it's important to take a look at the larger picture. And also take a look at, where are the misaligned incentives? Which assumptions need updating? We're dealing with a zero-sum game extinction levels of Delta smelt, salmon, amongst others. Time is a variable0 by which everything is measured. And what are we solving1 for today? This quarter? This year or this decade? Please, take a very long-term prospective, multi-generational. Permaculture, dry farming, urban rainwater capture, and other shared sacrifice will help us maintain a healthy ecosystem.	
710	1	I enjoy visiting the Bay-Delta Estuary to go fishing, see the wildlife, and learn about life on earth. Today, the numbers of fish are very low, extinction levels. Something is badly wrong. I am asking this Board to increase freshwater flows all the way to the ocean to keep the fish alive. We do not know the long-term costs of a further degraded estuary and the fish extinction. Please make the core freshwater flows a priority for my generation.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
711	1	You have environmentalists pushing for implementation of what that study showed back in 2010, 60 percent unimpaired flow. You have others resisting, understandably, very apprehensive about what this might do to San Francisco or to the agricultural districts. But, I think, as was the case back in the '90s and the early part of this century, accommodations can be made. This can be done in a step-by-step basis. And as you work toward a much better environmental situation for the river I think those now in opposition may be able to adjust more than they realize.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
712	1	On behalf of Assemblymember Frazier as we continue, as he proudly represents the 11th Assembly District, nearly half a million residents who call the Delta home, the District is "urban, rural, agricultural and industrial. And it includes people from all walks of life." This proceeding is very critical to the people of his district are going to be gravely impacted by the changes being addressed today. "The State Legislature and Governor Schwarzenegger explicitly stated (sic) the need to protect the Delta in 2009 when they passed the Delta Reform Act." And he believes that this change petition should be denied. And as an advocate for the Delta and Assemblymember Frazier, and those he represents, he wants to share with you his deep concerns. And to ask the Board to take into consideration the impact of your determination to the economy, to the environment, to the way of life of all the residents that reside within his district, to the water quality's impact, to our fish. And, as stated before, we're having changes being seen on the federal level and we know that we're asking you as the representatives for people of California to look at those you're hearing from today and to understand that your decision will make a long-time impact on all of those.	Please see Master Response 1.1, General Comments, acknowledging the concerns of elected representatives other community members. The commenter makes reference to a change petition, which is not included in these plan amendments. Please see Master Response 1.1 for further description and discussion of the plan amendments. Please also see Master Response 1.1 for a summary of the resource impacts evaluated in the SED, including economic, public water supply, water quality, and aquatic species.
713	1	I'm very concerned about the health of the complex ecosystem, which is the San Joaquin Delta fed by its major Sierra tributaries. Canoeing with the Tuolumne River Trust, many past Novembers I've witnessed the crashing number of spawning of Chinook salmon in the lower Tuolumne below La Grange Dam. In June I had to portage my canoe, because of the invasive	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		water hyacinth near the confluence of the Tuolumne and the San Joaquin. Every February I go bird watching at the California Department of Fish and Wildlife area at Grizzly Island. I worry about the health of the ecosystem for the multiple species that rely on the health of the Suisun Marsh. Some animals, like the California Clapper rail and the Suisun shrew live exclusively in that tidal wetland. Rare and threatened, endangered species, include the salt marsh harvest mouse and Peregrine falcon, California Ridgway's rail and others.	
713	2	I believe it's crucial that increased and improved flows from the tributaries go into the San Joaquin Delta. The current percent unimpaired flows from the Tuolumne is unsustainable for all. Chairwoman Marcus has stressed that a 60 percent standard represents what fish would have asked for if fish could talk. I believe that would be ideal. However, I understand we need to strike a balance for many interests for our common good. The Bay-Delta is a public trust. I would urge the Board to choose my preferred goal of 50 percent unimpaired water flow. I believe we can all make that work.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
714	1	Your proposal for higher flows in the Delta is one step in helping this entire estuary. In the June 2016 election over 70 percent of Bay Area voters approved Measure AA, a parcel tax of $12 per parcel to fund restoration projects in San Francisco Bay. That's over a million votes. I don't see them lined up behind me to speak today, but I hope that you'll consider those votes as you make your decisions relative to the SED. Also, in July of 2014 the San Francisco Board of Supervisors approved Resolution 288-14 urging protection of the San Francisco Bay-Delta Estuary. And I quote from that resolution, "The San Francisco Bay-Delta Estuary helps to power the region's economic engines, is the globally recognized symbol of our region, and its health reflects on our region's capacities, values and vibrancy." I believe that over 70 percent of Bay Area voters would agree with that statement.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
714	2	Some opponents claimed that habitat restoration, including approved spawning gravels, floodplain nurseries, would be enough to restore the salmon populations. But as we heard earlier today that myopic view ignores two critical elements. First, the science is clear that higher flows are needed along with those habitat restorations. And second, that salmon are not the only endangered species that will benefit from these higher flows. The entire estuary and all the creatures that depend on them need these higher flows. Please all you can to make that happen.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
715	1	Earth Law Center is concerned that the SED does not adequately protect Bay-Delta water quality, particularly as it pertains to aquatic species and habitat. The SED recommends a flow requirement in the San Joaquin River and its tributaries of 30 to 50 percent, with a starting point of 40 percent unimpaired flow from February to June. But these flow requirements are inadequate, both under the Clean Water Act and ethically, as they represent another step towards the extinction of numerous fish species. Under the Clean Water Act state flow objectives must fully protect beneficial uses. With their multiple-use designations, flow objectives must support the most sensitive uses, in this case fish and aquatic life uses. Ecosystem and species needs cannot be balanced away. The SED's flow requirement will fail to protect fish and aquatic life, whether fully or reasonably.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues. In addition, please see Master Response 1.1 for a discussion regarding the consideration of beneficial uses and for responses to comments that generally support or oppose the plan amendments, a specific percent of unimpaired flow, or an LSJR alternative. Please see Master Response 1.2, Water Quality Control Planning process for the authorities governing the water quality control planning process.
715	2	According to the State Water Board's 2010 Flow Criteria Report, an estimated 60 percent of unimpaired flow in the San Joaquin from February to June would be protective of aquatic life, fish and wildlife beneficial uses. State and Federal Fish and Wildlife Agencies have also testified that similar amounts are necessary to restore fish populations. However, the SED's	Please see response to comment 715-1.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		flow requirements fall well below this threshold and will predictably fail to correct the continued decline of salmon and other fish species. The SED itself explicitly recognizes that the Bay-Delta is in an ecological crisis, yet it fails to put it on a path towards recovery. In order to comply with the Clean Water Act and protect the most sensitive beneficial uses, the State Water Board must adopt flow criteria similar to the recommendations of the August 2010 Flow Criteria Report. Additionally, many are calling for a minimum of 50 percent San Joaquin flow in order for salmon and other species to have a shot at survival and we [Earth Law Center] agree this is a step in the right direction.	
715	3	We [Earth Law Center] are concerned with the State of Emergency Change Provision in the SED, which would likely be used to further weaken these already inadequate standards. With regards to drought we can no longer call them emergencies and significantly weaken our environmental protections. Droughts have always occurred with regularity in California and will continue to increase in frequency and severity as climate change impacts worsen. We must treat drought and climate change impacts on water as the new normal. And we must update the SED to prepare for rather than succumb to these challenges.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding emergency provisions and the drought.
716	1	One of the questions was about the continuous drought, like multiple years of drought. And yes, even without the SED in 2015 the Merced Irrigation District had no diversions from the Merced River. So it could have that impact and that would be multiplied.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
716	2	The median runoff to the Merced River is about 850,000 acre-feet, which is the smallest of the three tributaries. The total inflow to these reservoirs in a critically dry year was like 200,000 acre-feet. So it's less than a quarter. And if you have about 100,000 acre-feet of certain commitments, be it riparian water, refuges, and other districts, so basically you're left with about 17 to 18,000 acre-feet. So to say that there's 60 percent that you could still do something with, it doesn't mean that you'll always have the 60 percent, because there's a certain amount of water that you have to divert regardless of the type of year. We have no way to say to those folks that we provide water to, on their commitments that, "It's a dry year. I can't give you water." So basically, we rely on the storage from previous years to supply water in any critically dry year. There's not enough water in the river.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
716	3	I want to bring up the SAFE Plan. I'm kind of disappointed that the SAFE Plan was brought up in that fashion today, because it was brought up on the base on flow when we have been saying along, "It's not a flow only. It's flow and ecosystem, the river system restoration." Basically it's a combination of things, it's not one. And by the way, it's not less water than the FERC Environmental Impact Statement; it's the same amount of environmental system; it's not less than that plus other restoration.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
716	4	Looking at your graph--it shows the amount of escapement versus the flow of how do you explain 2008, for example, it had a higher escapement but less--it was a critically dry year. And also how do you explain the highest return out of the salmon to the Merced River this year? So all these things, I think they need to be taken into consideration. And one last point which also was brought up today, just to kind of answer that, is there is a capacity to the rivers to accept salmon. I mean, there will be a point of diminishing returns. You could dump all the water you want to, but there's only so much room for spawning in the rivers even	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		after you do the restoration. So that's something that we need to look at.	
717	1	The concerns that we've raised in the 25 past about the appropriateness of using unimpaired flow as opposed to functional flows. And what we've commented on before is that for salmon and most fisheries that it's really the functions that are provided by flow, things like temperature, turbidity, nutrients that are the primary drivers. And those are not directly addressed by unimpaired flow. So that's the first point.	Please see Master Response 3.1, Fish Protection, regarding unimpaired flows and functional flows and regarding potential temperature benefits, as well as other benefits, associated with the plan amendments. Please see Master Responses 1.2, Water Quality Control Planning Process, and 2.1, Amendments to the Water Quality Control Plan, regarding authority of the State Water Board through the water quality control planning process to reasonably protect beneficial uses and a description of the plan amendments. Please see Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, regarding the purpose and objectives of the plan amendments as they relate to the reasonable range of alternatives evaluated.
717	2	[Another] point, which is related to water quality in the south Delta and the Phase 1 SED, does tend to confuse impacts from the export projects with other impacts. And there's water quality impacts in the south Delta; a lot of those are occurring from local degradation, inadequate flow. There's an implication in many places that those problems are caused by the barriers in the south Delta. And that's not completely accurate. So that's a concern.	The commenter made a general comment suggesting that the SED confuses water quality impacts of the export projects with other impacts. The use of the term "many places" by the commenter is unclear, as it cannot be determined where in the SED the commenter was referring to. Please see Chapter 5, Surface Hydrology and Water Quality, for a description of water quality in the southern Delta and Master Response 3.3, Southern Delta Water Quality, regarding water quality in the southern Delta.
717	3	The last [point] is a technical concern with the SED that the groundwater impact analysis, I think, really needs improvement. Ignoring the requirements of SGMA that a long-term overdraft not be allowed and to effectively allow -- provide that there would be long term overdraft that could continue. That's not an appropriate assumption. And the analysis is not done to identify what the effects, even if you did allow that long-term pumping to occur, what would the effect on stream flow be? And those effects are not identified. There's existing analysis tools that are available: there's groundwater models by the USGS, groundwater models by the Department of Water Resources, those could readily identify those impacts. And those were not included in the SED and they really should be.	The SED does not require or encourage increases in groundwater pumping as a response to reductions in surface water. The SED reflects the historical local response to increase groundwater pumping when surface water availability is reduced. The State Water Board acknowledges that it will be challenging, but implementation of the plan amendments does not conflict with SGMA compliance; together they allow for integrated planning of California's water resources that does not trade impacts between surface and groundwater. It will be up to local entities to determine the precise actions that would be taken in response to the implementation of the plan amendments, with or without the future condition of SGMA. For further discussion on these issues and why groundwater models were not used in the SED, please see Master Response 3.4, Groundwater Resources and the Sustainable Groundwater Management Act.
718	1	It's my understanding that you did -- the Water Board did an analysis in 2010 that called for a 60 percent flow. I would advocate for what your science concluded, that would seem reasonable. If you run the numbers I understand that upwards to 400,000 salmon used to run in these rivers. With 1,000 now there in these rivers we are looking at about a quarter of 1 percent. That's collapse, that's a crisis. And I have much respect for what you do. I know that you're under immense pressures. But for the charter and the responsibilities of this Board, I would say to be considered a success, if this gets any worse you have failed. I don't know how to say that nicely. Also, worthy of consideration is that there is a tree of life that is connected to this water flow, to these fish, to this estuary, to all of the different organisms. We get half of our oxygen that we breathe from the ocean. I haven't heard anyone commenting or talking about this, but these species go out and are food supplies and live and breathe and are an essential link in the food chain in our ocean, not just our estuaries. How on earth can we say that we are leaders on climate change if we can't even facilitate a reasonable amount of good health in our own estuaries? Any growth has to be sustainable. Now, I hear lots of folks -- obviously it's a very difficult situation -- that need water for various uses for their lives. But any growth that's not sustainable is short-term. And if we kill our oceans and if we kill our rivers, so someone can have a job growing almonds that we export to Japan for a super-high price, then we have failed. Because that person will have that job only until we run out of oxygen, until climate change exacerbates the world, until	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		our rivers and our oceans are completely dead and we're eating Soylent Green. This is where we're headed: 200 years, 300 years of society, we have not been living in these sort of organized societies for very long. It's a very short period of time and to do this much damage in such a short period of time we are completely abdicating our responsibility to leave this planet for the future generations. And for that I implore you, 60 percent, no less.	
719	1	I'm speaking in favor of increasing water flows to protect fisheries.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
719	2	One of the groups that wasn't represented here today that's part of the State of California is the California Bioassessment Program. And I went to their last conference up in Davis. And they've been putting together these programs for the state for about 24 years. And I would urge speaking with them, because they have some really great recommendations about flows and duration for preserving salmonids and other fisheries. And they're tied into the food web, so they look at what are the fish eating, what kind of condition do those species need? And so, adjust the flows for that. So, I'd definitely get in touch with them.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
719	3	I'm concerned about whether you're diverting water through tunnels or you're diverting it in other ways, it seems to me over the last ten years or so that we've been talking about this the broader scientific community has been kind of shut out. And I know that I hear a lot of stuff about it, it's a fair stakeholder process, but if you shut out this scientific community that's not a fair process. And I've seen that going on in the last ten years.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
719	4	I wanted to say it kind of gets lost that San Francisco Bay is such an important body of water. And we have tourism, we have fishing, sailing, we have the shipping terminals. And we need a healthy Bay to keep all of that going, so don't just think about the Delta, think about the Bay also.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
720	1	Please work with the sister agencies of the state to protect the aquifers through the state from being treated like dumps for waste.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
720	2	Irrigation water and rainwater runoff could be more naturally stored in this way throughout much of the urban and agricultural state. During the current drought I began looking at the pricing structure of urban water. Tiered water rates could be used much more effectively to provide potable water for essential household use at low cost, while charging the full delivery cost of larger volumes of water used for irrigation in gardens or wherever. In fact, more and steeper tiers with better comport, with core expectations than water rate tiers reflect the cost of delivering water. Fixed charges may make it easier for water agency planning, but they are unfair. Tiered rates based on employment could also be extended to commercial and industrial water users. High-volume uses of water for irrigation or certain industrial uses would thus be incented to work with urban water agencies to make maximum use of recycled water. Tiered rates could also be applied to agricultural lands. Again, the cost of irrigation water for agriculture should not be based on the amount of land you own, but on the number of jobs the farm provides. Of course, rural delivery of water would continue to be much cheaper than water delivered for urban uses. But it should not be a free ride. For too many years I've seen water sprayed high into the air over the Central Valley fields on hot summer days. I've also seen water	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		sprayed into the air when it's raining. Central Valley fields, like those in peoples' gardens, must be served water at a high enough price that they will honor it and treat it with respect.	
720	3	I urge you on the State Water Resources Control Board to declare new expectations for water use in California. Natural agriculture will be protected. The claims of First Nation peoples to preserve their cultural fishing practices will be protected. And the state will accommodate urban and rural population growth, not by diverting evermore water from its natural purposes, but by using less water much more wisely.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
721	1	We are composed of a minority and disadvantaged community. About 65 percent is Hispanic, 15 percent approximately is African-American and we have a good percentage of Pacific Islander, about 7 percent, and the rest are other races. When the city [of East Palo Alto] was incorporated we received a relatively small water allocation of 2 million gallons a day. And we have been conserving, conserving, conserving to the point that we are actually using about 43 gallons per capita per day, which is much lower than the BAWSCA region that uses approximately 60 gallons per capita per day, or the state average. Due to that the City Council had to pass a Water Connection Moratorium last September. As a result of it we have been processing, but we won't be able to entitle a number of projects. Just to mention a few, we have a couple of projects that are proposed that would create 1.4 million square feet of space, which creates a substantial number of jobs for our community. There is the primary school. This is a project proposed by the Zuckerberg Foundation that would provide quality educational opportunities for low-income residents in East Palo Alto. And not only that, but also support health services, wrap-around services, for approximately 500 children to have better educational health opportunities. All of that has been--is impeded by the limited amount of water. The point of my testimony is to urge the Board to consider these types of impacts and also allow time for negotiative voluntary agreements to take place, so that the SED goals are achieved while mitigating the potential negative impacts to minority and disadvantaged communities.	The comment provides information regarding general characteristics of the service area and general information regarding a water connection moratorium in their service area. Please see Master Response 1.1, General Comments, for responses to comments that do not raise significant environmental issues or make a general comment regarding the plan amendments. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC Regional Water System (RWS) service area with implementation of the plan amendments. The State Water Board acknowledges the City of East Palo Alto's water conservation efforts and ongoing commitment to demand management of its water supply. To the extent that this comment raises similar issues or the same issues raised by SFPUC or BAWSCA, please refer to letter 1166 or letter 1191 to review responses to those letters.
722	1	In the middle of Silicon Valley where property prices have gone up 75 percent in the last 6 quarters, 18 months or so, East Palo Alto is basically the only community that has undeveloped land. And in a market that is spiking the way it is you might ask yourself, "Why is no one developing property in East Palo Alto?" The reality is--and I'm living this reality, you can go into East Palo Alto, you can invest the capital to buy land. You could invest the capital to build a building. What you can't do is get an occupancy permit from the Fire Department, because there's not enough water to flush toilets, have people wash their hands. And this matters. It's not just about real estate, but ultimately what it is about is the jobs that would come with those buildings. And in a community like East Palo Alto that's struggling to increase its property tax base.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
722	2	To keep the people of color who have been in that community there [East Palo Alto] instead of being pushed out of what is arguably the most, the deepest economic inflection point in human history, we need to have more water, so that we can build and bring in the kinds of companies that will give job access to the folks who are already there in that community.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
722	3	I want a full consideration of the species, including the people in East Palo Alto. So, I'd urge you to consider and support this negotiated settlement.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
723	1	I didn't see in my deed anything that says that you guys own my water, EPA own my water. I didn't see any of that in my deed. How would you guys like to pay 60 percent of your wages to support this, because that's exactly what you're trying to take out of my paycheck. Sixty percent, would any of you guys want to pay 60 percent of your paycheck? If that guy in there wants to pay 60 percent of his paycheck to support this--because that's exactly what you are asking for me.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
724	1	I just want to say that the salmon are essential to the environmental quality of the Delta. And actually to consumers like myself, they're very important. And according to the 2010 State Water Board Report, 60 percent of unimpaired flow between February and June would be fully protective of fish and wildlife. And I urge you to go with the science and respect the science and go with that recommendation.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
725	1	Ten percent of the water, in this state it's considered a good record in the urban infrastructure if only you're losing ten percent through leaks. The infrastructure crisis is sucking our rivers dry. If we fix the pipes, renew our infrastructure and make the investment in our urban distribution systems we don't have to have this argument about the rivers and taking more water out of them.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
726	1	I was born into an agricultural family and have been raised around the agricultural community my entire life. My dad and his siblings owned a family dairy and it was sold two years ago. Since selling, my dad has worked for another family-owned dairy/farm. The dairy has two sites, each around 2,000 cows, with a total of about 4,000 cows between the two sites. Along with the cows this family has many acres of land that are used to grow, which is necessary to feed the animals. If the proposed Plan takes effect we are forced to send more water into the Bay-Delta for fish and wildlife use. Many families will suffer. Not only will people like my dad be in danger of losing their job, but prices are going to skyrocket. If we are not able to grow our crops locally, because of a shortage of water, we are going to have to import the crops from foreign countries. This will increase costs for farmers all over, which will in turn require them to raise their prices in order for them to see a profit and be able to pay their employees with feed and their families. These price increases will directly affect consumers. We will see prices for meat, fruits vegetables and nuts, and any other agricultural related products go up. If the Bay-Plan Delta goes into action, we will all be left struggling for the sake of a few fish.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
727	1	I represent the third generation of my family who works in our family dairy, hay, and beef cattle business. Together my family overcomes great challenges and obstacles such as low prices, labor challenges, or other regulations you propose. How do we do this? Teamwork. What your staff has proposed is a one-sided approach to solving a multidimensional water framework within our expansive state. There is no teamwork. And this Plan is all about forcing farmers and communities into doing things the way you want them done. My dad has often been heard saying, "If we all row the boat together, we will get where we want to go faster. If we all row on our own, all we will get is choppy water." Please quit rowing on your own and row together with our communities. Teamwork is more -- is how we move mountains, so please join the team whose lives depend on agriculture and let's work together to make California great again.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
728	1	We [DWR] suggest various revisions to the SED to make it more factually accurate and consistent with California Water Law. An overarching comment on the SED is that the document, including its implementation plan, contains language assigning responsibility for portions of the Water Quality Control Plan to specific parties, including DWR. Such assignments should be reserved for Phase 3 in the Plan update, because the Plan update provides a foundation for considering the implementation elements in a subsequent proceeding.	Please see Master Response 3.3, Southern Delta Water Quality, for a response to comments about assigning responsibility to California Department of Water Resources and the United States Bureau of Reclamation for implementing portions of an adopted water quality control plan.
728	2	DWR believes it is inappropriate to include language within the Water Quality Control Plan and SED that dictates a result during the subsequent Water Rights hearing. This would be contrary to the procedural protections afforded to DWR and other affected water rights holders. It is the position of DWR that all language assigning responsibility to a particular party or parties within the SED and the proposed Water Quality Control Plan should be removed. Furthermore, any measures to protect beneficial uses that are related only to flows and water allocations should be postponed to the Water Rights phase the Board's proceeding.	Please see Master Response 1.1, General Comments, and Master Response 1.2, Water Quality Control Planning Process, for a discussion of the water quality control planning process, including the State Water Board's authorities and future water rights proceedings. Please see Master Response 3.3, Southern Delta Water Quality, on responsibilities of USBR and DWR for salinity in the southern Delta. As set forth in Appendix K, the salinity water quality objective will be achieved through water right and water quality actions.
728	3	Regarding the San Joaquin River flow objectives, DWR believes that the SED relies, in part, upon incomplete and out-of-date scientific information. The SED also lacks information on the impacts of predation on salmonids. It does not consider the Delta's historic flooding and saltwater intrusion. One consequence of this reliance is the mistaken conclusion that there exists consensus about the benefits to fish species of a barrier at the head of Old River. The SED fails to acknowledge that there are various regulatory agencies prescribing the actions related to the barrier, which may lead to incompatible operational requirements.	Please see Master Response 1.1, General Comments, for responses to comments regarding the scientific basis of the SED. The State Water Board used the best available science to develop the proposed plan amendments and in the supporting SED. A variety of data were obtained for the water quality planning process and establishing LSJR flow objectives that are protective of native fish populations migrating through the Delta and considering other beneficial uses, including, but not limited to, qualitative data from peer-reviewed published literature on topics specific to the plan area; peer-reviewed literature outside the plan area but on topics relevant to the proposed plan amendments; and qualitative data or personal communication with topic experts. Please see Master Response 3.1, Fish Protection, regarding information about predation on salmonids, use of best available science in the SED, and the benefits of the plan amendments to fish.
728	4	DWR believes that unimpaired flow objectives are ill-suited for real-time operations. While theoretically feasible, there are several hurdles that must be overcome before water project operators can use computed unimpaired flow for real-time operations. The primary hurdle is that some of the necessary data are not available in a timely manner. We also question a primarily flow-only approach to protecting fish. DWR recommends a more flexible approach that takes into consideration other actions to protect fish species, such as EcoRestore and the Delta Smelt Resiliency Strategy. It is only through a careful analysis of flow and its intended benefits that SED will adequately analyze how to protect beneficial uses. MR. [Steven] MOORE: Yeah, on this point I can't let that go without having staff perhaps provide a little bit of a clarification. Clearly, unimpaired flow is carefully calculated metric the Department uses. And yet, as we've discussed extensively for days, this can be a surrogate for real-time flow in terms of real-time operation. So, my question is can't we achieve, with basic flow-monitoring technology, some information that's more real-time on a 3-day basis that is not strictly academically unimpaired flow as calculated by the Department, but something that's akin to it that could be operationally useful? MR. [Les] GROBER: The detailed answer to this question is something that we're going to	Please see Master Response 1.1, General Comments, for responses to comments that do not raise significant environmental issues. Please see Master Response 2.1, Amendments to the Water Quality Control Plan and Master Response 3.2, Surface Water Analyses and Modeling, regarding the use of unimpaired flow in the plan amendments. Please see Master Response 2.2, Adaptive Implementation, regarding adaptively implementing the percent of unimpaired flow requirement and Master Response 5.2, Incorporation of Non-Flow Measures, regarding the consideration of the complementary nature of non-flow measures with flow requirements to protect fish species.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		have to answer when we get into the implementation, but you're identifying the tension that we saw this morning. The why a 3-day or even an instantaneous is better. Somewhere between the instantaneous and a 7-day becomes -- we just start pushing against what is feasible in terms of measurement. The Department already posts information in terms of real-time flow. If you look at that daily information it's kind of glitchy, because it relies upon estimating storage in reservoirs, determining numbers by difference. All of those things, once you get to a daily time step become very hard to measure. But it starts evening out over some time period. Seven days seems to be a potential sweet spot there. The last time we went out, we went out with a 14-day. A 14-day, you really start losing some of those optimal conditions. The bottom line is to the extent that you cannot precisely measure it in real time this is something that you can always catch up, because the requirement would be based on ultimately what does come down. So it's really not much of an issue in terms of determining the days, because you might not know it exactly day to day. But you certainly will know it in sufficient time in arrears to operate to it. MS. [Dorene] D'ADAMO: But in follow-up isn't unimpaired -- I mean, this is -- I actually think a block of water and adaptive management through a settlement process, ideally, where you've got a whole team of people working on the needs of the river in combination with non-flow --I think that's probably the best way to go. But in the meantime, we're using unimpaired to calculate a block of water, because we're talking about using flow shifting anyway. So, it's not being used. I mean, whether it's 3-day or 7-days in that chart that Board Member Moore, you called out that NOAA had, about how it was -- it can be a little bit unartful at times if you use a certain running average. In the end, isn't it going to get down to, or shouldn't it get down to functional flow? And so this block of water wouldn't be used as unimpaired flow. It would be used as a block of water that a team would determine what's the best, highest use for that water. MR. GROBER: Well, that's precisely one of the reasons to try to operate down to that 7-day and if possible even shorter, because that becomes -- that's one of the functions as was shown is important in terms of cueing various biological functions. That being said, there is difficulty with it. This can always be trued up in measuring that block of water. We shouldn't lose sight of the fact that the current objective is based on unimpaired flow, the determination of water year type. And then backing up from that, on having a flow requirement. All of it a month in arrears. So that's far less than optimal than the proposal, which is trying to both tighten up the operation to achieve some of those -- some of the peakedness and some of the cueing and the timing -- to agree more with the what's happening in real time, but mindful of the difficulty of doing so. So, it's trying to achieve really, the best of both worlds. MS. D'ADAMO: Right. But I mean, the -- MR. MOORE: Yeah. Because I have to say, Board Member D'Adamo, my ideal is real-time operation. I mean, I respect the block of water approach. I think we can accomplish a lot. So I'm not absolute, but I think where possible agreements and real-time ability to	

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		deploy has to be built within it. Otherwise, it becomes biologically meaningless. So I think what Mr. Grober is saying is there's a balancing here between the approaches. MS. D'ADAMO: Yeah. I mean, I was going to get into this at the end, but now might be a good time as well. If you look at Table 3 -- and there's a lot of talk about flow shifting, carryover storage -- but the objectives are in Table 3. And Table 3 has unimpaired flow and it's the 30, 40, 50 percent range. And probably what we should do -- now's not the time to debate this and get a legal analysis -- but I think we should as we follow up with staff, get a better understanding. It gets back to the issue that was raised on day one and that "what is the project?" So the project that's being analyzed, and I know you had a chart or a slide on it, that it's contained in Appendix K. Appendix K, my understanding is the Program of Implementation, it's how it would be implemented. But the objectives have an unimpaired flow and it doesn't have anything in there on flow shifting. It doesn't have anything in there about this flexibility of the block of water. So, I agree. I'd call it tension. I'd call it a legal tension as well. MR. MOORE: Anyway, yeah. So you're not going to make comments on the flow standard without getting a big discussion up here. MS. D'ADAMO: Yeah. MR. MOORE: But I'm sure we'll have more discussions with you, with the Department about this concept, because I don't think I got the whole story in your overview there. MR. HOLDERMAN: Well, I agree. I think a workshop with our staff and your staff to go over, particularly our operators, on how they operate the releases from the reservoirs and the travel time and all that in trying to figure out if they can do that in a real-time situation, which right now I don't they can.	
728	5	The SED contains inappropriate and erroneous information on water quality within the south Delta. Including water levels within the SED is inappropriate, as water levels do not affect water quality. Assimilative capacity of local channels is related to net flow, not water levels or tidal flux. And it has been shown frequently in passport proceedings that the temporary barriers in the State Water Project pumping do not change net flow in the south Delta. Temporary barriers are installed as mitigation for the SWP impacts. And water levels are designed to maintain or improve circulation in the area when compared to what would be present, absent the barriers in State Water Project pumping. The barriers are not specifically designed to improve water quality, but by sometimes modifying the culvert openings to improve circulation, which by the way is always at the expense of water levels, the barrier can sometimes, but not reliably, improve water quality in poor circulation areas that are upstream of the barriers. While the Board has in the past has recommended DWR continue to install the barriers, DWR does not agree the barriers should be required by the Board in a Water Quality Control Plan or a Water Rights Order, because the barriers are not a significant or reliable tool for	Please see Master Response 1.1, General Comments, concerning the State Water Board's authorities and the SED's relationship with other plans and policies. Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR to comply with the SDWQ objectives. Please see the response to comment 728-18 regarding water levels and tidal flux.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		meeting south Delta water quality objectives that DWR, frankly, should not be responsible for.	
728	6	DWR does not degrade water quality in the south Delta. The salt loadings in the south Delta occurs from salts centering in the south Delta at Vernalis and agricultural and M&I discharges in the south Delta downstream of Vernalis. DWR does not discharge salts in the south Delta and has no reservoir on the San Joaquin River from which we can release dilution water. The exports from the south Delta at Banks Pumping Plant removes some salts from the system, but the pumps are used in a dynamic sense to provide water supplies to south of Delta customers and to minimize adverse impacts to protected fish. Therefore, it is not practical to use the pumps for south Delta salinity control, as this may have unintended adverse impacts to export water supplies and fish. Regardless, the removal of salts from the south Delta area due to export operations will have little effect on south Delta water quality objectives. As to the factors that do impact water quality, DWR has conducted many years of data collection analyses regarding impacts to the State Water Project on south Delta water quality and hydrodynamics. Tremendous staff time and effort continue to be dedicated to gathering and validating that information. Because of these efforts, DWR and the Board possess sufficient information to appropriately assign responsibility for south Delta water quality objectives. Therefore, the SED should be modified to reflect the actual impacts in the State Water Project on south Delta water quality. Namely, that DWR's operation of the State Water Project export facilities and the temporary barriers improves water levels for local water users, maintains net flows, maintains or improves circulation, and can occasionally improve water quality in the south Delta from what is otherwise naturally available.	Please refer to Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR and USBR. Please see Chapter 5, Surface Hydrology and Water Quality, for a description of the sources of salinity in the southern Delta.
728	7	The SED recognizes that there is a considerable amount of salt loading in the south Delta downstream of Vernalis, which occurs primarily through local drainage return flows. The additional salt load is not attributable to either the CVP or the State Water Project. And it is not reasonable to expect the water projects to control it. The SED documents this when it proposed 0.7 EC at Vernalis and 1.0 EC in the interior south Delta compliance stations during the spring and summer irrigation season. DWR agrees with that proposal. However, if the Board is to set reasonable objectives for salinity in the south Delta it should also allow for the degradation of water quality in the fall and winter months by setting salinity objectives downstream of Vernalis at a higher level than the objectives set at Vernalis. This change would account for the high salt loading from normal agricultural soil leaching that typically occurs in these months. Although the SED evaluated and discounted a 1.4 EC year-round objective at the interior locations, DWR recommends a 1.3 to 1.4 EC objective during the fall and winter months when the Vernalis objective is 1.0 EC. DWR recently contracted with consultant ICF to conduct a study and report evaluating salinity patterns and effects of tidal flows and temporary barriers in the south Delta. The study identifies the source of high salinity water in Paradise Cut and Sugar Cut and explains	Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR to comply with the SDWQ objectives; for a discussion regarding leaching; and for a discussion regarding compliance locations. Please see Master Response 2.4 for a discussion of the fall and winter SDWQ objectives at Vernalis and the southern Delta.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		how this higher EC water is tidally mixed with the Old River flow and increases the measured EC at the Old River near Tracy Road Bridge Station, or the ORT Station, as we call it, the "Old River Tracy." The report provides an increased understanding of the south Delta channel flows and salinity patterns. It explains the effects of CVP and SWP pumping on south Delta salinity. And it demonstrates that export pumping and barrier operations do not increase the measured EC at the ORT Station or the frequency of D-1641 exceedances. This report, which we are -- just completed, will be available to the Board and will be available online to the public early this month, probably in a week or two. In addition to this recent study and report, it has been repeatedly shown by past field studies and reports that salinity at the ORT Station is heavily influenced by saline return flows that originate in Paradise Cut and Sugar Cut. Consequently, it is not reasonable to set salinity objectives at this location. It may be more reasonable to continue the Middle River and Brandt Bridge locations as compliance stations. The DWR recommends that the Board discontinue using the ORT station as a compliance location.	
728	8	The objectives for the proposal alternatives include meeting water quality objectives throughout channel reaches, rather than through previously specified compliance locations that are in D-1641. Such an approach to monitoring water quality would place additional responsibility on DWR to control for in-Delta diversions and discharges, factors that DWR cannot influence. Flows downstream to the compliance locations at Old River at Tracey Road Bridge and Old River at Middle River are naturally low during the irrigation season. Modeling indicates that almost all the incoming flow is diverted by in-Delta uses. And the reduced amount of flow returned to the channels is of worse quality. Therefore, controlling and monitoring for water quality within channel reaches could be very difficult and costly. Nonetheless, DWR believes it should not have the responsibility to ensure water quality within the south Delta.	Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR to comply with the SDWQ objectives and for a discussion regarding compliance locations.
728	9	DWR has concerns with respect to the SED and evaluation of impacts to groundwater and implementation of Sustainable Groundwater Management Act, or SGMA. The SED acknowledges that groundwater in basins subject to SGMA will be impacted by the increased flow alternatives, some of them significantly. The SED also assumes that groundwater sustainability plans can bring the basins to sustainable conditions without considering the impact of additional groundwater pumping caused by meeting the proposed alternative flow requirements. Deflecting the burden to address unquantified impacts from additional groundwater pumping to the groundwater sustainability agencies would result in a failure to reach sustainable groundwater management in the basins. The SED states the annual average groundwater balance can be expected to be reduced in terms of the equivalent about one-inch across the subbasins. It isn't clear what this means, as the adverse impacts cannot be evaluated or compared when pumping is expressed qualitatively and location-specific information is not provided. DWR believes that the extent of impacts of groundwater pumping should not be averaged across the entire basin. DWR recommends the amount of additional groundwater extracted to replace the loss of surface water deliveries should be expressed as a volumetric unit, such	The State Water Board acknowledges that uncertainty is inherent in a programmatic planning effort of this geographic and temporal scale. However, the State Water Board strived to use best available science for the impacts analysis, in accordance with CEQA and consistent with the requirements of the certified regulatory planning process, and the State Water Board did its best to find and disclose appropriate information. The SED is a program-level (not project-level) first-tier evaluation, consistent with State CEQA Guidelines, Section 15168. A location-specific groundwater analysis is outside the scope of the SED, because the State Water Board cannot reasonably foresee the mitigation actions local water users would take in response to surface water reductions, and quantification of the impacts of the proposed LSJR flow objectives would be speculative. For example, if local water users chose to build new wells or deepen existing wells in response to the plan amendments, the State Water Board could not forecast the location of the new wells, the depth of the wells, or the new extraction rate. For further discussion on the programmatic nature of the SED and the adequacy of such an approach, including why climate change was not included in the impact analysis, please see Master Response 1.1, General Comments. The SED uses historical 2009 levels of groundwater pumping for the baseline analyses. This is appropriate, because 2009 is the year the State Water Board issued the Notice of Preparation for the SED. For a detailed discussion on the basis for establishing the baseline, please see Master Response 2.5, Baseline and No Project. SGMA requires local groundwater sustainability agencies (GSAs) develop and implement groundwater

Ltr#	Cmt#	Comment	Response
		as acre-feet, and be location specific. Also, the groundwater data are not current and are not reflective of groundwater conditions affected by the current five-year drought. Groundwater extraction and subsidence has increased significantly during the drought and groundwater elevations have not recovered. DWR recommends the starting point for the evaluation of the alternative should reflect current groundwater conditions, should be more location-specific, express impacts in quantifiable units, and take in consideration future climate change impacts. MS. [Dorene] D'ADAMO: I have a question on that last slide. So we had a speaker -- I wish I could remember who it was, maybe about five back -- that said that our staff's analysis is inadequate on groundwater and that it should analyze the SED with SGMA. And that the Department has some information that our staff could use in developing that analysis. Is that accurate? Do you have information that could help our staff in the development of an analysis with SGMA? MR. HOLDERMAN: Well, I'm not the expert in groundwater. We do have an expert here that may be able to answer that question if you'll allow her to come forward. MS. D'ADAMO: Yes, I think it'd be helpful. And I'm not remembering -- does anyone remember? The speaker mentioned a couple of reports that are readily available at the Department. MR. GROBER: I think it might have Terry Erlewine with the State Water Contractors. MS. D'ADAMO: Oh, that's right. It was Terry, yeah. VICE CHAIR SPIVY-WEBER: Be sure and identify yourself and clearly your affiliation with the Department. MS. SCRUGGS: I'm Mary Scruggs. I'm with the Department of Water Resources and I work in the Groundwater section. I'm not sure what report is specific, but SGMA is just starting right now. And GSAs, groundwater sustainability agencies, and the groundwater sustainability plans, are being developed. The GSAs are required to put together by April of this year. Plans are not due until 2020 or 2022. And so, there is a lot of existing data. The data that was used in the SED went up to 20 -- I mean, sorry, 2010. It doesn't include information on groundwater from the drought. And so the conditions have worsened, as Mark [Holderman] had said in our comments, and so that starting point should be from where it is. So SGMA is requiring local agencies, the GSAs, to bring the groundwater basins to be sustainable by 2020 or 2022. Several of these basins are critically overdrafted. The additional requirements of groundwater pumping on unimpaired flows would increase that burden onto the groundwater, but it's unclear -- it's not quantitatively described in the SED -- to how much. So, they're already working at a deficit. What further deficit are they going to have to be working at to be able to be sustainable? So, hopefully -- and there is data available on groundwater levels, but there's also a lot of holes in groundwater. Groundwater is one of the ones we just don't have all that data. And	sustainability plans (GSPs) to sustainably manage local groundwater resources within 20 years. Variables, such as surface water availability and the amount water needed for groundwater recharge will be considered by GSAs as they develop GSPs. Since no GSPs were developed before the release of the Recirculated SED, it is unknown what actions GSAs will take to achieve the sustainability goal. However, SGMA was properly included in the analyses as an existing legal requirement to prevent further degradation of the groundwater basins and as a potential cumulative limit on future irrigation supplies in Chapter 9, Groundwater Resources, Section 9.4.3, Impacts and Mitigation Measures, and Chapter 22, Integrated Discussion of Potential Municipal and Domestic Water Supply Management Options, Section 22.4.1, Potential Impacts of LSJR Alternatives. Groundwater overdraft conditions in the plan area are legacy issues caused by unsustainable agricultural expansion; SGMA was passed by the legislature in 2014 to address overdraft issues. However, the State Water Board also has a legal mandate to reasonably protect fish and wildlife beneficial uses, which it is proposing to do with the plan amendments. The State Water Board acknowledges that it will be challenging, but SGMA compliance cannot occur at the expense of reasonably protecting surface water beneficial uses; both groundwater and surface water must be protected. Comprehensively addressing both resources allows for integrated planning that does not trade impacts between surface water and groundwater. The SED and plan amendments do not require or encourage groundwater substitution as a response to reductions in surface water. Rather, the SED reflects the historical local response to increase groundwater pumping when surface water availability is reduced. Actions that entities may take to replace surface water that may no longer be available due to implementation of a plan alternative are described in Chapter 16, Evaluation of Other Indirect and Additional Actions, Section 16.2, Lower San Joaquin River Alternatives—Other Indirect Actions. Substitution of surface water with groundwater is only one of the actions described in the Chapter. It will be up to local entities to determine the precise actions that would be taken in response to the implementation of the plan amendments, with or without the future condition of SGMA. For further discussion on the level of analysis required for the SED, the thresholds and criteria used to evaluate impacts on groundwater resources, and compliance with SGMA in the context of the plan amendments, please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act.

Ltr#	Cmt#	Comment	Response
		you can't go back and get historical data if it wasn't already collected. So it's moving in the right direction, but there's a lot more work to be done. MS. D'ADAMO: Well then how would you, if you think it should be a more specific detailed and quantitative analysis, how would you recommend going about that? MS. SCRUGGS: If you're going to -- what volume would be taken out and what basins would that be? So what would that be extracted and where are they now? And so what's that additional part that would be taken of where they are. That's what would be needed. Does that help? MS. D'ADAMO: Yes. And do you have any information that could assist in coming up with a range of what a potential groundwater management plan would look like in terms of the range that would be needed for the basin to rebound? MS. SCRUGGS: There's several sources. There's existing data that we have, there's local agencies that have groundwater management agencies or irrigation districts. The Department released the regulations on what's needed in the groundwater sustainability plans, so it would be a matter of looking at the particular subbasin. What volume would that be considered to be --would be replaced, the surface water that would be replaced by groundwater -- and looking at it in a specific subbasin. And that's what will be looked at in preparing and developing the groundwater sustainability plans. And in these areas that are critically overdrafted, they are going to have to figure out what do they reduce or how do they bring in more supplies to recharge that groundwater. So, additional burden of pumping on the groundwater is just it's digging a deeper hole, so how do you dig them out? And the way the SED was written, is it acknowledges that it will have a significant impact, but it also plays off saying that SGMA will take care of groundwater. Well, SGMA can't take care of groundwater, unless everything is taken into consideration. So in areas where you've got critically overdrafted basins and you're putting more burden onto it you're going to worsen the situation. So, is it tipping the scale to make it no longer sustainable? Or what will happen? I mean, it's going to take years to be able to get these basins to recover. MS. D'ADAMO: Okay. Thank you. MR. MOORE: I actually think based on the staff's briefings over the last couple of years we have taken recent groundwater data into account. We've looked at 2014 pumping rates -- I mean, correct me if I'm wrong, but I don't know if I agree with this bullet that I'm looking at right now as far as we haven't taken any of that, the drought, into account. MR. GROBER: I think we can all agree that groundwater is a big issue that will have to be resolved, but we used the best data that we had in front of us. So, I think what I've heard is that there haven't been other reports that have come up with the storage levels, the groundwater pumping rates. But we have. And I'm just looking in the Executive Summary, where we've exactly tried to do that. And we have a groundwater chapter where we've done a mass balance, where we have quantified the increase in groundwater pumping that we think would occur based on 2009 rates of groundwater pumping, recognizing that that's lower than the full capacity, based on 2014. And I think as I'd said earlier, mindful of using a	

Ltr#	Cmt#	Comment	Response
		number that is less unsustainable. What the sweet spot is, what is sustainable is an impossible question to answer. I expect there will be a lot more information in the next few years, but we did do that analysis to look at any number of ways what the current levels of groundwater overdraft are and how this would increase those rates of groundwater overdraft. MR. MOORE: That's right. And also, this is a water-supply-focused discussion. And I haven't heard anything about water demand management in that discussion yet, as far as SGMA goes. Thank you. MR. GROBER: And that's correct. Thank you for that, because I think it's worth pointing out that the principle effect of the proposal would be to reduce the quantity of surface water available. That will have an effect. And then the next effect that we see would stem from that would be some level of increased groundwater pumping. But the project itself is certainly not requiring or advocating increased groundwater pumping, it's just observing what has happened when there has been water shortage. MS. D'ADAMO: If we could get back to -- one of the things that I found confusing in going through the staff analysis is this metric for determining an impact, so many inches. And I think what I'm hearing you say is that we shouldn't be looking at it from a broad level, we should be looking at the local subbasin. And that information, at least the current state, is compiled --the current information that you have is compiled by subbasins. MS. SCRUGGS: Correct. If you average it across the entire subbasin, you know where are the wells actually going and where's the pumping? So, if all the pumping is in one area, averaging it across you've now averaged it, so you're not really seeing what's happening. Groundwater is very location-specific. So depending upon is you're aquifer more productive in an area. Do you have area subsidence? Are you increasing that? It's location, location, location. The data that was used in the reports that were referenced was DWR reports and it was a groundwater report, but it was based on data up through 2012 --sorry, 2010 and 2009. We haven't compiled further than that, because that was last we've done. There is data out there and it's available, but it's a matter of compiling it and getting it and evaluating it. And that's what will be happening under SGMA on the basins and on developing these sustainable groundwater management plans, they'll have to be looking at their specific basins and getting that data and bringing it up to date. But there's been a significant impact to groundwater with the drought over the last four or five years. MS. D'ADAMO: Yeah. And I'm just thinking that with all of the testimony that we've had from disadvantaged communities and concerns about drinking water wells, schools, and in certain communities like Planada, and I think Denair, it does seem that those impacts already are quite localized. And I don't know enough about what's causing those localized impacts. Is it the -- are we talking about shallow wells? But there are shallow wells throughout the region. But these are communities that seem to get hit. And so it does seem that spreading it out through across the entire subbasin isn't going to give us the information that we need in order to determine those disadvantaged community impacts that have been highlighted.	

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		MR. GROBER: But I think as you are hearing here, we don't have that, the detailed information, certainly not in reports. So we've done actually quite a bit for a programmatic analysis to know what the overall effect. And we say some words that we can't know exactly where these are all happening, but we do identify that there have been locally areas that have already groundwater problems. And that they are not going to get better with having reduced surface water availability. MR. MOORE: I think this gets to the issue, and it's a bit of a legal issue, but in terms of are we doing an adequate job of describing the potential impacts? And how much granularity is necessary? And what kind of threshold of significance that we need to do for this exercise? I mean, we're definitely encouraging comments on this. If we're too coarse in our analysis, and as you point out there may be specific areas that are vulnerable in the SED project area, we're listening. But in this discussion I didn't hear a lot of detail from DWR saying, "Oh, you ought to look at this report, because --" or "This new CASGEM data really gives insight into this area. That should be highlighted in the SED." So I just want to manage everyone's expectations here. This is a disclosure of potential impacts. It's really dependent -- the level of granularity of this analysis is dependent on available data. We can talk about, academically, what we've missed and all the important points about hydrogeology and its heterogeneity. But there's available data. And then there's an acceptability, to some degree, to accept a qualitative analysis of disclosed impacts. I don't know if you have any comments on that. MS. WON: Well, yeah. I would echo your statement that we can only do what's reasonably foreseeable. And that's the standard by which we are going to be held in a court of law. MS. D'ADAMO: So I'm going to just jump in here. I think that that's a good way to describe the issue is what is legally required of us? But on SGMA in particular, this is a top priority for the administration and so is drinking water. And so I think -- MR. MOORE: For this Board. MS. D'ADAMO: Yes. So, I think you may be correct from a legal perspective. I think from a policy perspective we need to do more, to the extent that we can. And so, if you do have some reports that you could help identify to turn, to point staff in the direction it would be greatly appreciated. Because I think that we have an obligation from a policy perspective to do more on the SGMA issue. And I know there was a slide that staff had on today's presentation on the disadvantaged community issue, in saying that -- there was the last bullet there, I'm looking for the slide, I'm not pulling it up here --but that the disadvantaged community analysis would be done as part of groundwater sustainable plans. That's not something we should be kicking down the road. I mean, that's something that we should be looking at to the extent that we can incorporate it into the analysis.	
728	10	The last update of the Water Quality Control Plan was over a decade ago and flow objectives for the San Joaquin River have not been updated for over two decades. During that time our understanding about climate change impacts has substantially improved. However, the knowledge has yet to inform the Water Quality Control Plan and in fact, will not significantly do so, even in this update as the hydrologic analysis for the Water Quality	The State Water Board used the best available science throughout the SED. A variety of data were obtained for the water quality planning process, including quantitative data from peer-reviewed published literature on topics specific to the plan area; peer-reviewed published literature outside the plan area but on topics relevant to the plan amendments; unpublished quantitative data from within the plan area and from outside of the plan area; qualitative data or personal communication with topical experts; and expert opinion if no

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		Control Plan does not consider future climate change impacts. Further, continual updating of the Water Quality Control Plan will continue to include the hydrology of the past, which is becoming increasingly irrelevant for water resources planning. For instance, the continued inclusion of hydrology from the first half of the 20th Century will dampen the impact of the increased variability experienced in the last half of the 20th Century and the markedly increased warming experience since the turn of the century. Since Water Quality Control Plan update processes can last 10 to 20 years, or more, the SED evaluation of impacts should consider future climate change impacts as part of the analysis.	other sources were available. Please refer to SED Chapter 14, Energy and Greenhouse Gases, for information regarding climate change and the consideration of climate change impacts in the Water Quality Control Plan planning process. Also, refer to Master Response 1.2, Master Response 2.1, and Master Response 2.4 for further information on the water quality control plan planning process, amendments to the water quality control plan, and alternatives to the water quality control plan amendments. The analysis of the plan amendments contribution to climate change are addressed in Chapter 14, Energy and Greenhouse Gases; Chapter 16, Evaluation of Other Indirect and Additional Actions; and Chapter 17, Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources. These chapters describe how the plan amendments would potentially contribute to global climate change. Please see Master Response 3.2, Surface Water Analyses and Modeling, regarding the modeling of the 82-year period, the adequacy of the model inputs and parameters, and climate change as it relates to the quantitative analysis. Please see Master Response 3.7, Greenhouse Gas Emissions and Analysis, regarding quantifying GHG emissions and the scope and approach of the GHG analysis in Chapter 14, Energy and Greenhouse Gases.
728	11	The key issues I'd [Mark Holderman, DWR] like to leave the Board with are: Consider other actions besides flow that can potentially be more effective at protecting fish. Assign responsibility for water quality degradation to those responsible for the degradation. Recognize from years of modeling and study data, including a recent report that you'll soon see, that south Delta's salinity problems are not caused by the State Water Project. Revise salinity objectives that account for degradation downstream of Vernalis in the fall and the winter months. Recognize that the Old River Tracy Station is not a reasonable compliance station for measuring overall south Delta water quality. And compliance by reach is going to be very problematic. And also apply DWR's recommendation that the Board's SED include groundwater and climate change impacts.	Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR to comply with SDWQ objectives. Please see Chapter 14, Energy and Greenhouse Gases, Section 14.2.3, Climate Change, regarding a discussion of potential impacts related to climate change. Please see Chapter 9, Groundwater Resources, and Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act, regarding impacts on groundwater resources.
728	12	ATT1: DWR Comments on SWRCB Phase 1 SED, January 3, 2017	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
728	13	[From ATT1:] SED contains language assigning responsibility Language should be removed and should be reserved for future water rights proceedings	Please see Master Response 1.1, General Comments, and Master Response 1.2, Water Quality Control Planning Process, for a discussion of the water quality control planning process, including the State Water Board's authorities and future water rights proceedings.
728	14	[From ATT1:] SED contains out-of-date scientific information Regarding fish, scientific information is out of date and incomplete: Lack of predation analysis for salmonids Should consider historical salt water intrusion, historical flood flows, and the impact of predation	The State Water Board used the best available science throughout the SED. Please see Master Response 1.1, General Comments, for information regarding requirements for using the best available science. Please see Master Response 3.1 regarding predation. The last part of the comment about considering historical factors does not bring up any significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
728	15	[From ATT1:] SED contains out-of-date scientific information No current consensus concerning the benefits of the Head of Old River rock barrier to fish	The commenter provided an attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments. The State Water Board used the best available science throughout the SED. Please see Master Response 1.1, General Comments, for information regarding requirements for using the best available science.
728	16	[From ATT1:] SED uses Unimpaired Flow Standards These standards are currently ill-suited for real-time operations because necessary data are not available in a timely manner to manage Project operations	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues. Please refer to Master Response 3.2, Surface Water Analyses and Modeling, for a discussion of modeling and the representation of operations used to evaluate conditions in response to implementation of the LSJR alternatives. Please refer to Master Response 2.2, Adaptive Implementation, for discussion of calculation of unimpaired flow and operation to an unimpaired flow objective. Furthermore, please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding the role of the STM working group, the preparation and use of annual adaptive operations plans, and the role of the Executive Director to allow for the ability to manage under potentially rapidly changing circumstances.
728	17	[From ATT1:] DWR questions the appropriateness of using a "flow- only" approach to protecting fish and wildlife beneficial uses.	The commenter provided an attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments. Please see Master Response 3.1, Protection of Fish and Wildlife regarding the unimpaired flow standard. Temperature and floodplain inundation analysis in Chapter 19 indicate lower temperatures and more floodplain inundation under 40 percent unimpaired flow.
728	18	[From ATT1:] South Delta Water Quality SED contains inappropriate and erroneous information on water quality within the south Delta - Net flows--not water levels or tidal flux--affect water quality. - Temporary barriers should not be required as part of the WQCP. - DWR does not cause degradation of water quality in the south Delta. - Factors that do affect water quality have been provided to the board through various processes including the CDO process.	Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR to comply with the plan amendment objectives and for a discussion of the temporary barriers. Chapter 5, Surface Hydrology and Water Quality, Section 5.2.8, Southern Delta, Southern Delta Water Levels and Flows, states: “Because agricultural diversions (siphons and pumps) may be limited at lower water levels (elevations) a general goal in the southern Delta channels has been to maintain suitable water elevations for the beneficial use of water for agriculture.” Water levels may have a small transient effect on water quality if a local discharge is temporary. A temporary discharge to a large volume of water would have less effect on water quality than a temporary discharge to a small volume of water because it would occupy a smaller portion of a river reach. However, if net flow and discharge flow are constant, water from the discharge would represent a fixed percent of the flow in a reach regardless of reach volume. As discussed in Chapter 3, Alternatives Description, Appendix K, Revised Water Quality Control Plan, and Master Response 3.3, Southern Delta Water Quality, water levels and flow conditions may affect salinity; these salinity effects are primarily associated with flow conditions, not water levels. Water levels are mostly important for facilitating water diversions. Tidal flows are also not as important as net flows in determining water quality. However, tidal flows provide a greater mixing volume and spread. If a discharge is temporary or if tidal flow can carry water to locations where it would be more likely to be transported away from a region (e.g., to a different channel with high net flow), large tidal flows can be helpful in improving water quality.
728	19	[From ATT1:] South Delta Water Quality Objectives should provide for salinity degradation from Vernalis to interior stations during fall-winter (Sept-Mar). 1.0 dS/m at Vernalis, 1.3-1.4 dS/m for interior stations.	Please see Master Response 3.3, Southern Delta Water Quality, regarding the responsibilities of DWR and compliance with the plan amendments. Please see Master Response 2.1, Amendments to the Water Control Plan, regarding the geographic boundaries of the plan amendments. Please see Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, for a discussion of plan amendments as they relate to the SDWQ objectives.
728	20	[From ATT1:] South Delta Water Quality Recently completed south Delta study [footnote 1: Evaluation of Salinity Patterns and Effects of Tidal Flows and Temporary Barriers in South Delta Channels, ICF, September 2016] concludes:	Please see response to comment 728-19.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		WQCP exceedances are due to local salinity sources; are not caused by SWP operations or barriers; are beyond the control of the SWP; [and] Old River at Tracy Road Bridge station not representative and should be changed.	
728	21	[From ATT1:] South Delta Water Quality SED proposed alternatives include meeting water quality objectives throughout the channel reaches. Places additional responsibility on DWR to control for in-Delta diversions and discharges that DWR cannot influence	Please see response to comment 728-19.
728	22	[From ATT1:] Groundwater SED assumes Groundwater Sustainability Agencies will take care of additional pumping to make GW basins sustainable. This increases the burden on locals in areas that are already critically overdrafted.	Please see response to Comment 728-9.
728	23	[From ATT1:] Groundwater Impacts to groundwater are not known for the following reasons: Qualitative rather than quantitative analysis that is not specific in terms of locations; groundwater data from 2010 and prior is used, which does not include impacts from the five-year drought; [and] climate change is not taken into consideration. DWR recommends adding a more specific, detailed, and quantitative analysis.	Please see response to Comment 728-9.
728	24	[From ATT1:] Our understanding about climate change impacts has substantially improved since the last WQCP update. However, the hydrologic analysis for the WQCP does not consider future climate change impacts. WQCP updates using distant past hydrology may become increasingly irrelevant for water resources planning as the climate changes.	Please see response to comment 728-10 regarding the use of the WQCP update and the water quality control plan planning process as it relates to climate change.
729	1	In order to address the problems impacting the environment in local communities we believe that a fully integrated approach is needed. And that should take into account not only an adaptive strategy for managing flows in wet versus dry years and implementation of non-flow restoration actions, but also water conservation, agricultural water use efficiency, and groundwater recharge at a meaningful scale. Then further evaluation also needs to be made too, and options spelled out for disadvantaged communities, as you all have been talking about. We think that's really important, especially with the anticipated increase in groundwater pumping that's likely to occur.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
729	2	I'd like to recommend specific actions for the Water Board to encourage development of settlement agreements that include a wide spectrum of non-flow action. So, we [Sustainable Conservation] strongly believe that increased flows in the San Joaquin system	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		must be accompanied by badly needed habitat improvements in order to adequately address fish and wildlife beneficial uses. So first, we recommend creation of a roadmap to help potential project proponents to understand how to acquire partners and to plan, develop, and implement restoration projects, okay? So restoration isn't necessarily a key area of expertise for many water agencies. And guidance on how to get the work done is really needed. Next, there's also a need to help identify potential funding sources and collaborators for projects. And the Water Board could dedicate regional staff to help identify viable projects and help to store them along through the permitting and implementation process. Finally, we believe that programmatic, or simplified permits, should be developed now to cover a variety of estuary restoration actions. If you're going to get these projects done, you can't wait till later, so that would definitely save time and money and get more projects done and create a lot of incentives. Because otherwise, if some of these actions aren't taken into advance I'm afraid that folks aren't going to pursue these voluntary settlement agreements.	
730	1	I do feel that regardless of whether or not I have an agricultural background, agriculture is constantly reflecting not only my life, but impacting my community as a whole, for the simple fact of being that one our greatest socioeconomic opportunities and opportunities for successes. And where we've actually seen the majority of our successes is directly from the agricultural realm, where we've seen job opportunities. Where we've seen students within the FFA [Future Farmers of America] program, which is the largest youth organization across the nation, is constantly revolutionizing individuals' mindsets in order to ensure that they have opportunities for success within the future. So ultimately, today I'm not necessarily advocating for a world where we're not going to see any benefits towards the fish industry. But I'm ultimately suggesting a way in which we're capable of increasing the opportunity for negotiations, where we're going to see the agricultural industry still in the spotlight. Especially taking into consideration the benefits not only on the economic standpoint, but to our day-to-day lives. We have to realize that it's not just our lives in the future that are going to be impacted, but its youth organizations where we have 635,000 members within the FFA program; 85,000 of which are residing within California as of right now. That's 85,000 peoples' futures solely anticipated and solely relying on an agricultural industry that were currently jeopardized within the California realm.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
731	1	I'm a senior at Turlock High School and a four-year member of the Turlock FFA Chapter. As you can see, I am wearing the blue and gold jacket that you've seen multiple times over the course of these meetings across the Central Valley. And as you can already probably figure out, I'm the son of a farmer. And of course, this proposal will affect our family's livelihood as farmers. But over the past few months there have been many different and redundant testimonies on how the unimpaired flow proposal will be affecting family farms and other professional businesses and organizations. But one matter has not been discussed -- on how it'll affect everyday K-12 students. According to the California Department of Education 2015-2016 school year database of	The commenter's concerns regarding school lunch programs are acknowledged. The State Water Board understands that local, regional, state, and federal agencies who manage, provide, and finance school lunch programs have numerous constraints and variables that must be considered when developing and maintaining the programs. However, the financial viability of school lunch programs is not within the authority or purview of the State Water Board or within the purview of the current water quality control planning process. Please see Master Response 1.1, General Comments, for responses to comments that contain general information regarding organizations and community concerns. Please see Master Response 1.1 regarding responses to general economic comments and requirements to consider economics, as well as Master

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		how many children are on the free or reduced lunch program, nearly 67 percent of those students in Stanislaus County, 61-and-a-half percent in San Joaquin, and 80.6 percent in Merced County students are on this program. The Free Lunch Program is granted upon families where their yearly income is at or below 130 percent of the poverty line. And reduced price is granted upon those who are between 130 and 185 percent. And keep in mind that the poverty line for the year of 2016 was about $25,000 for an average family of four. The Lunch Program requires all students who come into the cafeteria to eat lunch to take the main meal, which can vary from being a sandwich to nachos, to take a fruit or vegetable, and a milk. And which every part of that meal is, obviously, an agricultural commodity. Not to mention how the water quality in schools will fall if more groundwater has to be used. But anyways, the full price of the meal varies from $2.00 to $3.00. The question that you need to answer is will the estimated jobs being lost affect a number of families needing to use the School Lunch Program? And will the full price of those meals have to be raised and therefore decrease the number of students eligible for those free and reduced lunch programs in the counties stated previously and other surrounding areas?	Response 8.0, Economic Analyses Framework and Assessment Tools, for more detail regarding the requirements to consider economics and the framework under which economics is considered within the SED, including regional economics and jobs within the plan area. Please see Chapter 9, Groundwater Resources, Chapter 13, Service Providers, and Master Response 3.6, Service Providers, regarding groundwater, water quality, and potential impacts to service providers.
732	1	The Board is well aware of Northern California Water Association's interest in the Sacramento Valley. You maybe wondered why are we here this afternoon on the San Joaquin. The short answer is that the approach taken by your staff on the SED, the unimpaired flow approach, we believe is fundamentally wrong-headed. We believe that it involves an outdated, regulatory mindset that essentially takes a meat axe to this problem where we need a scalpel. What we've been proposing for the last few years, as many of you know, is what we call a functional flow approach. What it does is it starts with Water Code Section 13000, the basis for Porter-Cologne. And it says let's treat all of the beneficial uses as equally meeting in your Water Quality Control Plan. It then says let's look at all of those beneficial uses, all of the needs for the environment, for agriculture, for urban uses and let's figure out what those needs are. And then let's figure out--and we call this functional flows--what flows are necessary to meet which specific purposes. Not an unimpaired flow approach that literally says we're going to have a huge amount of water without tying it very closely to the needs of fish or agriculture or urban areas. This morning Member Moore, you used the phrase, bioengineering...and we think that's exactly the right way for this Board to approach it. We urge that you take that type of an approach and rely upon the Delta Science Panel's recent report from November that did not identify unimpaired flows or even flows at all as one of the limiting factors in the Delta estuary.	Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding percent of unimpaired flows and functional flows. Please see Master Response 3.1, Fish Protection, for information regarding ecological benefits of February-June flow objectives.
733	1	I was born and raised in Arcadia in Southern California. And childhood trips to the desert taught me that I lived in an arid country and the water is precious and needed to be treated with great care. Later, camping on the Eel River in the Redwoods taught me the close relationship between the richness of those woods and the inner-dependence between them and the water and the salmon. At a time of water scarcity, what's needed is conservation and efficiency. Not only of water, but of energy. The health of the Delta is essential to our economy as well as to California's	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		water system and the diversity of fish, plants and animals it supports, and people. We want our salmon fisheries to thrive, not to be sacrificed to industrial agriculture profits. Inadequate freshwater flows are damaging the Delta and the salmon and steelhead populations and the larger California economy. There have been a couple of mentions of the suffering of disadvantaged communities, for lack of adequate water. At the same time we see very wealthy communities, perhaps adjacent as in Palo Alto and East Palo Alto, where there's a great deal of water waste, extravagant use. So it seems to me some need exists to do a little evening of water use. In Southern California I've read in recent years that water districts have recognized that they can't continue to expect the water from Northern California, so they're investing in water cleaning and recycling plants. In view of the drought's effects and the escalating consequences of climate change we can no longer allow California water policy to defer to the demands of industrial agriculture.	
734	1	I think what the scientists said, just means we have to have a greater flow: 50 percent is better than 40 percent, 60 percent is better than 50 percent. And we cannot continue what we have presently for our flow through that Lower San Joaquin.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
734	2	In terms of technology, there are companies out there that I think can do much to help. And I think the experts within the Board should reach out to a company like XiO in San Anselmo, California. They have worked with municipal and mutual water communities to help with devices that are cloud-controlled and brought about some tremendous efficiencies. And so I would encourage you to contact them and have a conversation, but I'm sure there are many other companies out there too. And by the way, I don't own any stock in that company.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
734	3	This could well be the most important point for you all, and that is the attitude that we all take now. Pretty much it's an "us versus them" attitude. And we really do need to move away from that. I think we're getting people of very diverse points of view into the same room. It might be knocking heads a little bit, but I think it's worth getting beyond that. Otherwise it's going to be a bigger challenge for all of you.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
735	1	Much of the testimony has been concerned with economic impact of reducing some of the water. All the crops grown in California amount in normal years to around $36 billion. That's the highest in the country by a big measure. However, I'd like to note some other California institutions that are not in agriculture. For example, Apple has revenues of $234 billion last year, Google at $75 billion, Intel at $55 billion. These and other innovative firms like Facebook and Sales Force and Twitter and eBay, to say nothing of Hollywood and Aerospace or our great universities, they help drive the state's economy, which is currently at $2,500 billion. So, if you take the $36 billion as a percentage, it's less than 2 percent of California's. And if you include all of the indirect ones and you generously define them it's well under 10 percent. So, this is not a giant engine of growth in California. I think we want to have successful, sustainable, profitable farming. But there are other priorities, as well.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
736	1	All of our [North Bay Trout Unlimited] members, whether they fish or not, support and appreciate knowing that healthy fish populations exist in the rivers. And perhaps, most	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		importantly, we want to ensure that these experiences are available to future generations.	
736	2	In considering our requests for freshwater flows that are adequate to support fish populations, please also consider the economic contributions that recreational fishing makes to the California economy. We buy equipment, we stay in local hotels, and eat at local restaurants when we travel. We provide revenue to the California Department of Fish and Wildlife in the form of licenses and fees. We pay a 10 percent federal excise tax on fishing equipment that goes directly towards supporting local conservation.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
737	1	Our Chapter [Trout Unlimited, John Muir East Bay Chapter] supports the State Water Resources Control Board in the efforts to help farmers, commercial and recreational fishermen, urban and industrial water users, and environmental groups cooperate on the issue of increasing river flows into the Bay-Delta.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
737	2	Considering climate change, drought, the potential extinction of salmon and steelhead, we Californians need to come together and agree that water conservation and water-use efficiency can play an important role in increasing flows in the rivers.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	1	Although I agree with the increased flow rates, I think that many other systems need to be implemented simultaneously. One of them being, let's offer some subsidies and some incentives for farmers who are conserving their water resources and implementing more conservative practices.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	2	Let's focus on groundwater recharge. We've heard a lot earlier about how we know very little about groundwater and how it's so critically overdrafted at this point. We're pulling much more out of the ground than we're replenishing and it's going to hurt us, I think, and be extremely detrimental in the long run.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	3	Let's start putting a tax on wells and water that we're taking out of the ground. Other states are doing this and it's something that California hasn't started, but I think that it's a public resource. And buying land shouldn't give landowners unlimited access to the resources below them, at least without some sort of monetary exchange for the resource. We can take that water tax and put that into research for groundwater and start to learn more about the movement and distribution of groundwater and how to efficiently replenish it.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	4	I think we can continue to make habitat improvements and build more surface storage and catchment systems.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	5	I feel like my generation inherited a water debt and crisis that I don't want to pass on to the next. As a Water Board, you have immense power to protect our state's natural landscapes. You have the power to leave a positive legacy for future generations.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
738	6	Central Valley is blessed with uniquely fertile soil and it behooves us to take advantage of that resource. And there's a certain amount of water that's also needed for agriculture. I wholeheartedly agree with that. However, there are ways to provide food for families without destroying ecosystems that make this state what it is. We can't put short-term interests above long-term sustainability. No new practices are going to be installed and implemented until there is a driving force requiring us to do so. We can be that driving force. Transitioning to new irrigation systems may be difficult and initially costly, but there's no	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		price tag on having healthy and sustainable watersheds for all generations. So, although I think it's very important to increase flow rates I think we should also be investing our energy and money into solving the water issue holistically.	
739	1	BAWSCA [Bay Area Water Supply and Conservation Agency] understands the value of the Bay-Delta ecosystem and that the status quo is not sustainable. In nine words, BAWSCA supports the objective of the Bay-Delta Plan: simple, clear and understandable. In twenty words, BAWSCA will work with other stakeholders to protect the water quality in the Bay-Delta for the humans, fish and other wildlife. Again, simple, clear and understandable.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
739	2	BAWSCA [Bay Area Water Supply and Conservation Agency] is already committed to exploring scientifically proven ways of rehabilitating fish habitat in the Tuolumne River, such as gravel augmentation, managing fish predation and ensuring the flows support habitat improvements.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
739	3	The SED raises a number of concerns, including the unproven presumption that other water supplies or transfers will be available to the Bay Area in times of shortages, to make up for the water reductions due to increased flows. BAWSCA [Bay Area Water Supply and Conservation Agency] is also concerned that the SED fails to take into account the likely actions in times of shortages of other water suppliers, who use the largest portion of this supply.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
739	4	BAWSCA [Bay Area Water Supply and Conservation Agency] is concerned that while the SED recognizes that implementation of the flow proposal is expected to result in potentially significant economic impacts in the Bay Area, a full analysis of these impacts is actually not included in the draft SED.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
739	5	I brought with me a map today I'd like to share with you [see ATT 1]. And it shows my 26 member agencies in San Mateo, Santa Clara and Alameda County. I will call out in particular -- we did have a representative here from East Palo Alto, who is one of my member agencies. And this map shows what the residential-per-capita use was in the service area during the most recent mandatory reduction period. And you'll note that there are 10 water suppliers that serve 55-gallons-per-capita per day or less during that period, including the City of East Palo Alto. And that there are only 3 that serve more than 80, which is actually the statewide average. And we believe, looking at this, it really hits home that conservation is an essential responsibility of our agencies and their water customers that they serve. At the same time we believe it is equally important for this State Board to understand and acknowledge that municipal water users, specifically in our three-county area, need a reliable supply to support the economic viability of their communities.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
739	6	In a recent Chronicle article, State Board Chair Felicia Marcus, shared her opinions on the Bay-Delta Plan and the SED. Chair Marcus is correct that this is not an effort to choose a winner between the urban and agricultural water users or the environmental advocates. BAWSCA agrees. This is an effort to protect the water quality of the Bay-Delta for all users: for humans, fish and other wildlife. The solution may be out there, but everyone will have to do their part. The Governor has indicated his strong support for negotiated voluntary agreements to resolve this issue.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		BAWSCA is committed to continuing to work closely with the diverse interests and stakeholders to develop that shared solution. This should be a strategic process, not a legal brawl. It is about sharing the river for our mutual benefit. It requires tough action and respect for all interests, ingenuity, open minds, sticking with the facts, crafting a solution in which all users can survive and thrive.	
739	7	[ATT 1: Map: Average Residential Customer Uses 60 Gallons per Day in BAWSCA [Bay Area Water Supply and Conservation Agency] Service Area]	The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.
740	1	Each year we constantly reevaluate irrigation practices to gain efficiency and better use valuable water supply that we currently have. Some of these upgrades have been going away from flood to center pivot irrigation technology, minimal tillage, and even dipping into the technology sector for soil mapping for evaporative transportation rates to help us better use the water we have. While these are helping reduce our water use I fear that further cuts would hinder our ability to produce high quality feed and food.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
740	2	I was going to hit on the SalSim report, but we've already acknowledged that as flawed and changes need to be made to it. So having said that I would like to ask staff if there is any other potential flaws, matrixes that are wrong that they have found, or how we proceed from here.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
740	3	Your groundwater impacts, I feel, are another thing that needs to be addressed. I currently do farm in an irrigation district that has no water. We have raised our fees 300 percent to start addressing SGMA and these unimpaired flows could damage all of that work.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
741	1	I'm here today because I'm concerned about the long-term viability of ag in this region and the communities that depend on a predictable and reliable supply of water. Our employees and the families supplying us milk will be directly impacted by the proposals we are considering here today. I've got three requests. Fully consider the economic impact. Milk's California's number one valued ag commodity and the dairy industry is responsible for 65 billion in economic activity. I'll leave a report that details that. This economic activity is dependent upon a reliable supply of pasture and field crops. Forage crops are foundational to a cow's diet. There are no nutritionally adequate substitutes and importing these feedstuffs is not economically feasible. If forage crops are nearly eliminated under the 40 percent unimpaired flows, as the SED predicts, dairy farms will be eliminated, local food production eliminated, and all the beyond-the-farm jobs that are dependent on this fresh milk supply. The SED fails to fully consider the value of the loss of forage crops by failing to consider the downstream impacts. When these are fully considered, I believe the impacts of the proposed unimpaired flows will have a devastating economic impact on this region	Please see Master Response 3.5, Agricultural Resources, and Master Response 8.2, Regional Agricultural Economic Effects, for discussion of the impacts to dairies.
741	2	[R]ecognize that disadvantaged communities will be hit the hardest. Water is the lifeblood of our communities in this region. This region is home to 1.5 million people, most of whom live in disadvantaged communities.	The SED describes the potential environmental impacts of the plan amendments in the plan area in a program-level analyses and presents mitigation for significant impacts in Chapters 5 to 14. The economic implications of the impact on agriculture in the plan area are documented in Chapter 20, Economic Analyses. Please see Master Response 2.7, Disadvantaged Communities, regarding the assessment of potential impacts of the plan amendments related to disadvantaged communities (DACs), and the State Water Board's technical and financial assistance programs for DACs.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
			Please refer to Master Response 8.2, Regional Agricultural Economic Effects, for a discussion regarding the potential impacts of the plan amendments on employment.
741	3	Milk is a fresh, perishable product that cannot be transported long distance. If a milk supply is not readily available, dairy processors will be forced to close or relocate out of state, taking their skilled year-round jobs with them. Hilmar Cheese Company alone represents $100,000 million in annual payroll and nearly 1,000 jobs. In our case, Merced County would be the hardest hit, where the unemployment rate is 8.6 percent, already 60 percent higher than the state average.	Please see Master Response 8.2, Regional Agricultural Economic Effects, for discussion of the potential effects on food processors.
741	4	[T]his decision will hurt people and the most disadvantaged communities in the state. This is why I believe it's critical we understand the impacts and mitigate the negative outcomes for people in this region.	Please see response to Comment 741-2.
741	5	MS. D'ADAMO: I have two questions. MR. D. AHLEM: You bet. MS. D'ADAMO: first of all to the extent that you're able to answer this question, because I understand -- well first of all, how many producers do you rely on? MR. D. AHLEM: Two-hundred. MS. D'ADAMO: Two-hundred? MR. D. AHLEM: Yes. MS. D'ADAMO: So do you have a sense of the forage crops that are supplying the two-hundred dairymen? MR. D. AHLEM: What are they? MS. D'ADAMO: Yeah. Are they supplying their own, on average, or what sort of a crop mix are you seeing? MR. D. AHLEM: It's a mix, so it's either they're growing their own or they're relying on neighbors to sell them those products as well. MS. MS. D'ADAMO: Okay. So to the extent that we are making any assumptions that a dairyman may retire their forage crop, so that the water can be moved to somebody with permanent crops, does that make any sense? MR. D. AHLEM: No, not on an ongoing basis, it's just not practically feasible. So on a small degree -- possibly, but forage is key to a ruminant's diet so nutritionally you can't replace it. There's not a substitute, so if forage goes away you're talking about importing and the distances are so far that it's not economically feasible. You're going to see cows leave and dairies leave the state before you see that happen, if we have unpredictable and unreliable water. And the chances of that are even greater if you consider the SGMA impacts that we're looking at as well. MS. D'ADAMO: that was my next question and that is where are you going to get the feed if you happen to have a dairy where you're reliant on -- maybe you don't have enough land	Please see Chapter 11, Agricultural Resources, Impact AG-2, for a discussion of potential impacts on dairy and beef agricultural uses, as well as Appendix G, Agricultural Economic Effects of the Lower San Joaquin River Flow Alternatives: Methodology and Modeling Results. Please see Master Response 3.5, Agricultural Resources, for information regarding dairies as they relate to the agricultural resource impact analysis. Please see Master Responses 8.1, Local Agricultural Economic Effects and the SWAP Model, for information regarding impacts on animal feedstock. Please see Master Response 8.2, Regional Agricultural Economic Effects, for information on economic effects to dairy and beef cattle sectors.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		to grow your own forage crops entirely and you're reliant on your neighbors -- where are you going to get that feed? And I hear you saying that those dairies would likely be slated for closure. But if you got feed from someplace else where would it be coming from? MR. D. AHLEM: You're going to struggle to find that up and down the Valley if we're all in this basket, so it's already a competitive market for feed. You're looking at bringing in feed from out of state and that's just not economically feasible.	
742	1	First off, I would like to talk about how I could be affected by the proposed revision, but I think that we need to step back and take a look at the bigger picture. Back in 2012, when the Bay-Delta Plan was revised a draft clearly stated, and I quote, "That there would be a significant, but unavoidable impact to our region." Well, since then our region has worked tirelessly to cut down and conserve water usage. And has done so quite successfully. Please tell me that we didn't waste billions of dollars building dams, hatcheries, canals and farms in efforts to have a reliable source of water that was supposed to be ours for over 100 years. So I say to the Delta our region has been generous enough, even years later after all the water conservation efforts, you still want more. The fact of the matter is our region has nothing more to give. It's time to start thinking of the vast impact this proposed Plan will have, the lives and futures and jobs of countless people in our region will affected.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
742	2	All in all I'm asking that you sit and rethink all of the impacts, no matter how small you think that they might have. Revise and rethink as much as possible. I urge you to reconsider. The State Water Board has already taken so much for our region, so I just ask you to keep this one question in mind. What if this time you're asking for too much?	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
743	1	We all understand that the SED comes on the heels of a long and detailed evaluation of unimpaired flow benefits to aquatic habitat. And that as a programmatic document it's not going to be able to analyze the impacts in as much detail. However, the approach taken to groundwater impact evaluation in the SED represents a fundamental imbalance in how ecosystem benefits are evaluated compared to regional adverse impacts to water supplies. Specifically what I mean is this, where on one hand work on evaluating instream ecosystem benefits was informed by several scientific panels, there were no panels to inform the impact analysis. Instream processes were evaluated using several models, but the approach to groundwater resource evaluation was very generalized, based on an incomplete water budget, and did not include any modeling. So on the one hand the ecosystem evaluation is able to predict specific temperature profiles along the streams, acre days of floodplain inundation and it's tied very clearly to benefits, outcomes and objectives. On the other hand the groundwater impact analysis uses a regionalized theoretical metric of one inch of draw-down to predict whether significant or adverse impacts to water supplies will occur. That metric is very abstract and there's no explanation how it was derived, why is it not one-half inch or two inches? And it's virtually impossible to tell even the approximate location of where adverse impacts will occur. Finally, the ecosystem analysis spans a range of potential conditions whereas the water supply impact analysis is based on a single groundwater use scenario. The scenario was selected ostensibly as the most likely outcome, but no evaluation was performed to see if it actually meets the criteria for being sustainable under SGMA. For a meaningful analysis, we would expect that at the very least there would be a sensitivity or an uncertainty analysis	Please see Master Response 1.2, Water Quality Control Planning Process, regarding State Water Board authorities and consideration of beneficial uses in the context of the water quality control planning process. Please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act, regarding the approach to analyzing impacts on groundwater resources, including discussions on groundwater models, the one-inch regional threshold, and sustainable groundwater management. The SED is a program-level evaluation. The impact analysis on aquatic biological resources described in Chapter 7, Aquatic Biological Resources, and the impact analysis on groundwater resources, describes in Chapter 9, Groundwater Resources, are in accordance with State CEQA Guidelines and appropriate for a program-level evaluation. The State Water Board acknowledges uncertainty is inherent in any programmatic planning effort of this geographic and temporal scale. The State Water Board strived to use the best available science in preparing the SED and plan amendments. For further discussion on the programmatic scope of the SED, including CEQA requirements for program-level evaluation and the adequacy of such an approach, please see Master Response 1.1, General Comments.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		done. And as it is, I believe it leaves the state vulnerable to criticism of a policy bias.	
743	2	I have to respectfully, but emphatically disagree about all the available tools having been used. C2VSim is a model that was specifically developed by DWR for this kind of evaluation. And it's currently being utilized by several local efforts in Merced, Stanislaus and San Joaquin counties, and would be very capable of doing this kind of evaluation without having to go to protracted lengths to gather additional data.	Please see response to Comment 743-1.
744	1	Diversion, one definition is the action of turning something aside from its natural course. The irrigation districts and San Francisco are very good at this with respect to water. Another definition is something intended to distract attention from something more important. And I'm thinking that these folks are even better at that. Have you seen the information campaigns? Even their names are not honest, "Worth your fight." Worth my fight to help them continue devastating the Tuolumne River, so that they can keep extracting six-tenths of a billion dollars in revenue a year? How about, "Save the Stan?" It should be called, "Save the Stan for the people who dammed it, removed the upper 60 percent of the spawning area, and take about half of the average yearly flow out of it." They even describe these river flow increases that we're now talking about as diversion and taking water from the river -- the exact diametric opposite of the truth.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
745	1	We will be filing more extensive comments with the Board prior to the deadline. Today, I wanted to focus on some concerns that CCA has about the economic analysis done within the SED. Firstly, the SED significantly under examines the potential impact of the proposed Plan changes on the beef industry. Throughout all of Chapter 11 and the Appendix G, I think there's about five paragraphs that speak specifically to beef production. That's simply not enough analysis. Not only does the SED fail to properly examine the impacts on the beef community, the conclusions drawn from a scant analysis also fail to accurately reflect the economic burden that the new faux standards would impose upon the beef producing community. The SED acknowledges that under reduced surface water conditions summer pasture can become scarce and may limit grazing opportunities, resulting in potential reductions in herd size. What the SED fails to acknowledge, however, is that California's cattlemen have already significantly reduced herd sizes in response to the ongoing drought and further reductions will imperil their economic viability. The SED downplays the loss of pasture resulting from reduced surface water availability by mentioning that Cal CAF operations are able to substitute other food sources for irrigated pasture land. But the SED fails to appreciate the significant economic burden of securing and transporting that substitute feed source. The SED predicts that the impacts upon grazing are less than significant, because much of the pasture in the plan area is unsuitable for conversion to other crops or nonagricultural uses. However, the risk of conversion is far from the only relevant concern. This analysis ignores any consideration of whether that pasture continues to have any economic viability for that rancher's livelihood. Additionally, the SED overlooks the reduction in agricultural land values that would attend the reduction in water supply reliability.	Please see Master Response 8.1, Local Agricultural Economic Effects and the SWAP Model, regarding the scope of the agricultural economic analysis and potential effects of reduced water supply reliability. Please see Master Response 3.5, Agricultural Resources, for discussion of the potential effects on dairies and livestock operations. Please see Master Response 8.2, Regional Agricultural Economic Effects, for discussion of the potential economic effects on dairies.
745	2	I just wanted to state that all of those harms that I've mentioned will be exacerbated by the failure of the SED to account for the Sustainable Groundwater Management Act. That will reduce water supply even further and will increase those harmful effects upon ranchers.	Please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act, for discussion on SED consideration of SGMA. Please also see Master Response 8.1, Local Agricultural Economic Effects and the SWAP Model, and Master Response 8.2, Regional Agricultural Economic Effects, for

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
			information regarding agricultural economic effects.
745	3	I don't see this as a situation where we're asking you to prioritize agriculture above other beneficial economic uses--or beneficial uses, I should say. What we're asking is simply that you fully examine the other alternatives to strike a better balance among all beneficial uses, including agriculture.	Please see Master Response 1.2, Water Quality Control Planning Process, for responses to comments regarding the State Water Board's consideration of beneficial uses within the context of the water quality control planning process. Please see Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, regarding the feasible alternatives appropriately defined and evaluated in the SED, as required by CEQA.
746	1	I'm with Friends of the San Francisco Estuary. And as our name implies, we urge actions that ensure a thriving, resilient Bay-Delta Estuary for generations to come. Just a few thoughts today, to be articulated further in our comment letter.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
746	2	The economic harm anticipated by farming communities and urban areas has been a significant focus of these meetings. But the economic benefits of these recovered river systems have received less attention. The revised SED does a much better job than the previous version in referencing potential economic benefits including fishing, recreational values, and nonuse or existence values. However, the SED makes quantitative estimates of impacts, but only offers a qualitative analysis of some benefits leaving us with trying to balance hard numbers against an incomplete narrative description. We know that a monetary value can be ascribed to a healthy river system, whether or not people intend to use it for recreation or other active uses. And its value can be calculated as provided by some examples in Chapter 20 of the SED. In fact, one of the most comparable examples in Chapter 20, the 1990 Upper San Joaquin River study would indicate a possible total willingness to pay a benefit of almost $20 billion annually, in 2009 dollars, as a result of restoring salmon on the Upper San Joaquin River through higher instream flows.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
746	3	The value of ecosystem services that restoring these rivers and their salmon populations could provide in the form of nutrient cycling, sediment transport, soil and water quality, reduced water treatment requirements, aquatic and terrestrial food webs and other services. All of that could total in the hundreds of millions of dollars. A quantitative estimate of these benefits should be developed or you run the risk of underestimating their value.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
746	4	Adaptive management strategies must balance flexibility with strong enough safeguards to protect and restore salmon and other fish and wildlife, water quality, sediment transport and the river ecosystems. These safeguards should be maintain natural variability and a hydrograph to ensure these benefits and enough flows must be available for them to be successful.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
746	5	Voluntary settlement agreements must achieve the benefits that the Water Quality Control Plan is responsible for. And the SED provides an important backstop to these discussions and ensures that a key system recovery does not get bargained away in the process.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
747	1	My family has been in California since the 1700s. My ancestral grandmother was a Melones Indian and she was the first recorded Native American to marry a Spaniard in the 1700s, which was officiated by Junípero Serra. And I think about what the river systems were then.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		You said we can't go back to the beginning. But when we're arguing over 10 percent of the water if you think historically what have we done to the California rivers, which one is still thriving and sustained like it was originally? I don't think there's a very big answer to that question. So to -- and gradually through mining, diversions, farming, it is incrementally destroyed, gradually, gradually, gradually. So now when we're here talking about this 10 or 15 percent of water we all recognize that river systems are essential for the life of California. So we have to incrementally revive it through special application, better irrigation. But the focus should be to have a thriving river system, which we don't have right now. So anything we can do to that is essential and we have to think of the big picture. You know, we can't think of the next 10 years. We should be thinking of the next 300 years.	
748	1	I want to wish you all a Happy New Year. I wish you peace and prosperity and good health. And today, I'm here to ask of you to grant the same thing to the people and fisheries of the Delta. Recent news reports over the vacation break explain that fish are not rebounding. Not because flows don't matter, but because we have depleted the estuary of flows for far way too long. We can no longer split flows in a way that favors unsustainable growth. This is why the SED is flawed, 40 percent unimpaired flows will not save or restore fisheries or protect urban and environmental justice residents from degraded water quality.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
748	2	There are more green lawns in L.A. than there are in the urban areas around the Delta. There's no shared sacrifice being asked of Californians to preserve the Bay-Delta Estuary.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
748	3	What is proposed in the SED is only enough water to prolong time until we reach extinction of fisheries -- fisheries, which support multiple economies in the Delta and coastal economies. A lack of needed flow will also lead to a weakened salinity standard that will impact domestic use of water for hundreds of thousands of people in the Delta, agriculture jobs, and tens of thousands of people who are subsistence fishers.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
748	4	If the Board rules a 40 percent average unimpaired flows, and a weakened salinity standard, are the new standards for the San Joaquin River then you will make the Delta the sacrifice region for California. The State of California will be writing off the Bay-Delta Estuary for unsustainable agricultural development in the San Joaquin Valley. And the State of California will be4 writing off the people of the Delta for exports of almonds.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
748	5	My last sentence is that the 40% average unimpaired flow will violate social, economic and environmental justice policies as set by the State of California.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
749	1	We are recreationalists. We enjoy the Tuolumne River. We enjoy our time away from the urban sprawl of the Bay Area and we get out to the Central Valley and many places. And we just make any appeal to restoring the environmental values that are obviously the backdrop of this epic public debate.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.
749	2	I do represent a number of landowners and increasingly public interest organizations that, when they look at the SED and they see a big section on voluntary agreements, for some of us that's shorthand for a section of the Water Code called Section 1707. These voluntary tools do risk going into machine gun fire of sorts if agencies like the Wildlife Conservation Board are putting publicly backed water bond dollars on the table for the assurance that the State of California and Californians, are getting an environmental benefit	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment on the plan amendments or do not raise significant environmental issues.

Table 4-1. Responses to Comments			
Ltr#	**Cmt#**	**Comment**	**Response**
		that enhances stream flow. Whether it be groundwater sustainability or other mathematics and metrics, it becomes very difficult for any so-called petitioner to initiate a petition that might run the gauntlet of trying to come out of any of these tributaries: the Merced, Tuolumne or Stanislaus. And again, this is only Phase 1. Phase 2 has other tributaries in the Sacramento that each could voluntarily bring a contribution to an instream flow target outside the regulatory gambit of Endangered Species Act, the Clean Water Act, and of course the Public Trust Doctrine. So all I would ask is that the state agency do its utmost to protect the integrity of those expenditures of public dollars for environmental values, but recognizing that it's not an all or nothing regulatory gain.	